Earned Value Management:

Part Two - Implementation Challenges

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In the last issue[1], we examined the concept of Earned Value Management (EVM) and its implementation in a number of different Federal agencies. We also discussed several limitations and some special applications of EVM. In this second article, I describe some of the significant challenges I see in fully implementing EVM in accordance with the latest OMB guidelines.

Application of EVM to Government Resources

OMB Circular A-11, Part 7, directs that EVM be applied to government as well as contractor resources. While several agencies have tried to implement this, results have been mixed. One serious problem is that few government agencies require that their own (in-house) costs be tracked against individual projects, much less against specific tasks within a project.

In a recent study[2] of 29 projects run by five civil agencies, the GAO found that while 6 of the 21 projects that were required to use EVM had ANSI compliant EVM systems in place for their contractors, none had such systems in place for their in-house costs. Where in-house costs were reported, ad hoc systems were used and data could not be verified. Our own discussions with students here at the Information Resources Management College indicate that, with the exception of fee-for-service organizations, the appropriate accounting systems to track EVM data are either not in place or not used.

The "bible" for EVM is ANSI/EIA Standard-748-A, which establishes 32 elements for a fully-compliant Earned Value Management System. These are grouped into various categories: Organization; Planning, Scheduling & Budgeting; Accounting; Analysis & Management Reports; and Revisions & Data Management. The National Defense Industrial Association (NDIA) Program Management Systems Committee has published an Intent Guide which describes the guidelines for each of these 32 criteria. I believe the major challenge will be in meeting the following guidelines:

· *Overhead and indirect cost accounting and control:* The organizational elements responsible for establishing and controlling these costs must be identified and these costs must be applied equitably to all project costs. This must be done at the Agency level, not in the project or program office.

· *Cost and Performance Measurement, and Recording Direct Costs:* Within a project each

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- Les Pang, Editor-in-Chief

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element of the Work Breakdown Structure (which defines the entire scope of the project) must be assigned to a control account. Control accounts will be used for planning and budgeting a given portion of the work and then for measuring actual costs and schedule against those plans. This requires a certain amount of flexibility in the accounting systems that track actual costs. That flexibility might or might not be available in all financial systems.

· *Management Reserve:* There is considerable reluctance to establish a management reserve, since this is often seen as an unnecessary luxury and, even more importantly, vulnerable to budget cuts ("after all, it *might* not be needed").

However, the biggest challenge in applying EVM principles to government in-house resources will not be in the accounting systems, but, more critically, in the associated cultural change many agencies will require. In planning life cycle costs, in-house resources must be considered and capital investment decisions must reflect these costs. The "heavy lifting" will be in the discipline required to record and track costs against the plan and to report earned value against planned value.

Establishing Appropriate Thresholds for EVM

OMB requires that an Exhibit 300 be submitted for each major acquisition investment and that, for the development phase, EVM be used to measure performance. Major investments are defined as follows:

> ***Major acquisition/investment*** means a system or project requiring special management attention because of its importance to the mission or function of the agency, a component of the agency or another organization; is for financial management and obligates more than $500,000 annually; has significant program or policy implications; has high executive visibility; has high development, operating, or maintenance costs; or is defined as major by the agency's capital planning and investment control process.[3]

As to the application of EVM:

> EVMS [Earned Value Management System] is required for those parts of the investment where developmental effort is required. This includes prototypes and tests to select the most cost effective alternative during the Planning Phase, the work during the Acquisition Phase, and any developmental, modification or upgrade work done during the

Operational/Steady State Phase. EVMS is to be applied to both government and contractor efforts. For operational/steady state systems, an operational analysis system as discussed in Phase IV of the *Capital Programming Guide* [Editor's note: This is the Supplement to A-11, Part 3] is required. A performance-based service contract/agreement with a defined quality assurance plan should be the basis for monitoring contractor or in-house performance of this phase.[3]

Note that OMB requires EVM on major acquisition investments, regardless of size, but only on the development phase when the risk to the government is particularly high.

DoD, on the other hand, only requires EVM be used on contracts greater than $20 million; it is optional below that threshold. It also discourages the use of EVM on firm-fixed price, level of effort, and time and materials contracts.[4]

Other agencies have gone so far in the other direction as to require that EVM be used on *all* projects, including those in steady-state. Not surprisingly, this is proving extremely difficult and may well divert resources from implementation where it counts: large, high-risk projects.

Numerous studies (the most famous of which is probably the Standish report[5]) have indicated that the risk of failure increases significantly as the size and complexity of the project increases. For this reason, incremental development is the preferred method of acquisition, with a focus on incremental deliverables that can be completed within 18 months. Additionally, I believe EVM techniques do have a role in both fixed price and level of effort tasks and contracts, as discussed in Part 1 of this article.[1]

Bias in Project Estimates

There exists a built-in bias in government acquisitions that almost guarantees that programs are under-estimated in the planning stage, and this, in turn, increases negative variances to the point where they almost insure project failure.

On the government side, there is a tendency to underestimate project costs in order to get a "wedge" in the budgeting process. Since an agency's investment budget is largely determined by numerous factors outside its control, the lower the cost estimate, the more projects that can be initiated, and the more

likely a given project is to be approved.

On the contractor's side, since most new contracts are competitive and price is a significant, often dominant, factor in award, there is a tendency to underestimate project costs during the preparation of the proposal. This is particularly true for cost-reimbursable contracts where the risk is on the government.

So, everybody's happy… until the project begins.

In some respects, the worst thing a project manager can attempt to do is to manage to an under-funded baseline. This often means that certain tasks get short shrift: requirements analysis, quality assurance, peer reviews, testing, etc. And these are just the sort of activities that catch errors in the early phases of a program, when they are relatively easy (cheap) to fix. Skimping on these activities greatly increases the ultimate project cost as an error that would cost $1 to fix in the early stages of a program might well cost $40 or more to fix in the later stages. [6]

Additionally, once a project is underway, it develops a significant following. Careers are at stake, budgets are at risk, and all biases are toward optimistic projections ("Besides…. we can't work any harder…. and things just might get better"). In this environment, earned value can act as a dose of cold water.

Recommendations

There are several actions agencies can take to reduce a number of the problems described above.

First, not all investments are major, in the sense indicated by OMB Circular A-11 Part 7. Only those that truly meet the criteria need be reported and tracked through an Exhibit 300. If an investment is not "major," the agency has considerable flexibility in implementing an EVMS.

Even where full compliance is required (or desired), ANSI Standard 748-A does allow scaling for specific applications, where that makes sense.

> EVMS scalability is viewed as a spectrum employing the principles of EVMS as a fundamental to all programs and the EVMS guidelines as applicable to large, complex, and/or high risk programs; allowing any program regardless of size and complexity to realize the benefits of earned

value management.

Scalability should not be confused with "tailoring" or "EVM-Lite," terms that are often used as an excuse to comply with some, but not all, the criteria.

I recommend that each agency review their EVM policy to establish thresholds where full EVM is required; establish what portions of the 32 criteria are required where full compliance is not required; and under what circumstances EVM is not required at all. For example, EVM might only be required on projects that exceed a certain dollar threshold (probably less than the DoD threshold, but certainly not to include all IT projects) and that have a development schedule of over 12 months. I would also recommend that the use of EVM be encouraged on fixed-price contracts where they exceed that same level, for purposes of tracking progress, not cost, and on the Level of Effort (LOE) portions of other contracts, consistent with the discussion in Part 1 of this article.

In addition, I believe that most government in-house costs can be characterized as LOE and can be treated as such within most current government accounting systems. Again, see Part 1 of this article for a brief discussion of the treatment of LOE costs.

Agencies must discourage underestimating project costs. While this is easily said, it is not so easily done. A generation of accurate EVM reporting, however, might provide enough historical data to identify major underestimates. I also suggest agencies encourage, rather than discourage, the use of management reserves on major contracts/projects. Management reserves are established to address the uncertainties of the typical IT project. These same uncertainties are, to a significant extent, the cause of major project over-runs.

Finally, the Integrated Baseline Review (IBR), as required by DoD[7] on all major IT programs, should be required by the Civilian Agencies for all major investments. The IBR serves as the point where the government and the vendor formally establish the baseline and agree to cost, schedule and scope targets. It is at this time, normally a few months after contract award, that senior management must ask the critical questions:

- Have we identified all the work to be accomplished?
- Is the schedule reasonable?
- Are the resources sufficient to complete the full amount of

Corporate Performance Management (CPM): Ready for Prime Time?

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Students from the "Changing World of the CIO" Course

Corporate Performance Management (CPM) is an umbrella term integrating the processes, methodologies, metrics, technologies, and systems which are required to measure and manage an organization. CPM focuses on synchronizing how the organization executes its business strategies while performing in a more efficient and effective manner. This is achieved through the integration and automation of scorecarding, business intelligence, and planning (COGNOS, 2005). CPM applies technologies necessitating integrated platforms addressing department, industry, and enterprise-wide performance management needs.

Benefits

The intent of CPM is to empower senior management with readily available data and information to make more timely and effective decisions. In addition, CPM provides the means for senior management to ensure its guidance is being implemented. CPM has demonstrated its value by assisting senior management to achieve better performance through a more comprehensive analytical approach. Here are its benefits:

- Tracking products' performance; using "balanced scorecards versus individual metrics" (COGNOS, 2005).

- Uninterrupted enhancements; "Closed loop decision processes"; "Cross-functional" core scrutiny and breakdown, and advanced data analyses for innovative thinking leading to future opportunities (Aberdeen Group, 2005).

- Supporting methodologies for linking strategy to the allocation of assets (financial and non-financial) so that strategies can be transformed into action; helping members of the organization focus on key issues and critical data rather than on all the data and events that are possible; and delivering the right information to the right people at the right time in the right context (Coveny, 2006).

Potential Issues and Challenges

- *Integration and Process Standardization.* CPM is supposed to help managers by providing a standardized management process. IT infrastructure and platforms must be integrated so that a CPM suite with common analytic and reporting components can be used throughout an enterprise. Distributed corporate architectures, possessing varying hardware and software, pose a barrier to integration of a common CPM platform.

- *Practical Strategies (Defining What is Important).* Organizational leadership must employ practical strategies which can be implemented by the CIO. In the case of CPM, corporate management must tailor its information requirements to provide a required management focus.

- *Consistency across Workgroups.* Designing and implementing a system to work across all job types and positions within an organization can be a challenge in CPM implementation. The goal is to have consistency in learning and to define competencies/standards across workgroups.

- *Time and Resource Constraints.* Time allocation and commitment to the established schedule can cause issues. As stated above, commitment from work group leaders is essential.

- *Training.* One of the greatest issues that a company faces is employee training. Adequate training is required to ensure that everyone in the system has the information and skills required to work effectively.

- *Culture Change.* As CPM is implemented, the organization must change culturally, to eliminate the stove pipes. Culture change takes place through top management's enforcement of policy, stakeholder buy-in throughout the development and implementation of the CPM system, and adequate education and re-training.

- *Defining Appropriate Metrics.* For a government agency, relevant metrics for CPM are more difficult to define. The private sector typically uses ROI models, since return is easy to measure in terms of the corporate profitability. Government agencies have neither profit nor revenue; therefore, metrics must be defined in both qualitative and quantitative terms. Metrics should be designed based on integrated data sources and to perform risk analysis, forecasting, planning for finance, expenses, compensation, and capital expenditure.

CPM in the Federal and State Government

Unfortunately, CPM implementation seems to be dragging along at the Department of Defense (DoD) level. The 2004 GAO report "Defense Management: Tools for Measuring and Managing Defense Agency Performance Could Be Strengthened" indicates that, for the most part, aggressive CPM policy has not been implemented. After 6 years, DoD's original implementation of performance contracts has yielded only moderate gains in performance. Beginning in fiscal year 2004, DoD gave defense agencies the option to use either performance plans or balanced scorecards. Full integration of a CPM solution could help DoD with additional goals of strengthening accountability for achieving results, requiring performance measures to align with agency strategic goals, and requiring the measures to be more comprehensive in scope to better demonstrate results. Additionally, it should link relationship between resource needs and performance, and provide contextual information that could strengthen

performance management (GAO report, 2004).

At the local level, such as in the City of Coral Springs, Florida, the implementation of CPM in 2003 has developed an index of ten performance measures to indicate the city's "stock price." Their goal was to be "the premier city in Florida in which to live, work and raise a family." The measures used were determined most critical by a customer survey. They include residential property values, school overcrowding, crime rate, and an overall customer satisfaction rating. The city has developed a total of 29 "key intended outcomes" in support of the "stock price." This information is reviewed every year to generate a city business plan (National Partnership, 1999). Since their initiative began, much of the work to generate this data and provide analysis has been automated using various templates and quarterly data input at the department level. To standardize the process and compare their performance with other cities, Coral Springs participates in the Performance Measurement Consortium of the International City/County Management Association (ICMA). ICMA templates enable cities to compare their outcomes with others.

Success Measurements

In order to effectively measure the performance of any system, the intended outcome of the implementation of the system must be clearly defined. Key Performance Indicators (KPIs) should be specified in measurable terms, and the associated data collected, analyzed and reported to ensure the system is delivering as intended. In the case of a CPM system, the intended outcome of the system implementation is to use technology to automate the collection, analysis and reporting of data related to the KPIs associated with the objectives defined in the corporate strategic plan; to provide critical data to the data consumers at every level; and to provide insight and to reduce or eliminate stovepipe solutions. In order to measure whether a CPM deployment is successful, the performance assessment plan should include measurements in each of the intended outcome areas, such as: Report on strategic data; Report on interoperability among systems; Relationship between objectives and budgeting; Workforce acceptance; and Project performance.

Future Implications

The benefits of developing and implementing a CPM system are in alignment with the objectives and mandates outlined in the policy frameworks we have been discussing. It is safe to assume if the adoption of the CPM into organizational processes is effectively accomplished, CPM has potential to become the technology implementation of choice for Federal agencies to accomplish the goals set forth in the policy frameworks we have been studying. As shown in the following figure (the evolution of performance management), CPM is the culmination of previous methodologies of Business Strategy - Information Technology integration. As technology continues to advance, improvements in both hardware capa-

bility and delivery vehicles (data presentation languages/platforms) will create greater opportunities for innovation and technology leverage. CPM, if not a final product, is a step in the evolution of the business-technology merger. Since each of the preceding technologies supports the next emergent technology, it can be reasonably assumed that an investment into a CPM system will retain its value as a foundation in the event a technology or paradigm shift occurs which enables a greater alignment of business goals with technological advances (Bailey and Danilo, 2001).

Conclusions

The main challenge in CPM implementation is that its success depends not just on the CPM technologies alone, but also on the company's willingness to adopt a new wave of changes CPM brings in methodologies, processes, cultures, etc. This is not unlike the implementation of ERP that introduces industry best practices and requires a company to reevaluate its business practices. The experiences at the Defense Logistics Agency (DLA) and Department of Defense Education Activity (DoDEA) showed that the CPM implementation in 2004 was still behind -- in terms of the ability to link resources needed to performance, know data quality, and provide contextual information. The CPM efforts in the Federal government are progressing but have not yet produced actionable information to help executives making resources decisions to boost their organization's performance.

The success of Coral Springs showed the city leadership communicates its vision clearly and triggers cultural changes. The city has taken time and significant investment in training to get to where they are now, with a streamlined performance measurement process, tracking fewer but higher quality indicators. Today, the strategic plan and business plan are concise and easy to read documents. The budget has also been simplified and is more user-friendly. The level of visibility builds accountability and public confidence and trust in the process. Lessons learned from this city can be applied in the Federal government and perhaps CPM can then be ready for prime time in terms of the Federal government.

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Enterprise Architecting – A Maturing Discipline

The Evolution of and Growing Interest in Enterprise Architecture as a Governance Tool

By Catherine M. Connor

Enterprise Architecture Student

Enterprise Architecture (EA) has been the subject of much interest since John Zachman's 1987 *Framework for Information Systems Architectures* provided a foundation for subsequent research and developments within the discipline. Although some still think of EA as technical infrastructures, a solid EA program develops a broad depiction of key elements of the enterprise, and offers an effective governance tool for superior decision-making and organizational agility.

The Federal Government started on its journey towards the systematic use of EA as a governance tool in 1996, with passage of the Clinger-Cohen Act. Uses of EA that were almost non-existent immediately following Clinger-Cohen have grown to now encompass the *Federal Enterprise Architecture* (FEA), a program managed by the Office of Management and Budget (OMB) FEA Program Management Office (FEA PMO) to provide a comprehensive business-driven blueprint of the entire Federal Government.

Evolving a successful EA program is a challenging proposition that requires excellence along several dimensions, and the need quickly arose for guidance to foster consistent growth and quality in this relatively new field of architecture application, and for evaluative tools to assess the maturity of established EA programs.

Since Zachman's seminal work, a number of other researchers have developed EA models and associated products, and there is an active community of practice. This article discusses the EA work of six organizations, and articulates select points of interest from each of their unique perspective and products. They include OMB, the National Association of State Chief Information Officers (NASCIO), the Institute for Enterprise Architecture Developments (IFEAD), Gartner, the IT Governance Institute (ITGI) and the Government Accountability Office (GAO).

The material reviewed includes primarily EA Maturity and Assessment Frameworks, in other words those products and models that enable an individual to identify progressively more mature characteristics of an EA Program, and to assess the maturity of a given EA Program. In a number of cases, the maturity/assessment material is not generic. Rather, it is based on a particular way of structuring the EA itself, a structure generally referred to as an "EA Framework." In those cases, the EA Framework developed by the organization is also discussed.

Establishing an Effective EA Program and Measuring Program Maturity

In his *2005-2006 FEA PMO Action Plan: Enabling Citizen-Centered Electronic Government*, Chief Architect Richard Burk (OMB, Office of E-Government and Information Technology) outlines his plans to use the FEA as a transformational mechanism to guide and inform program decisions government-wide. To support this plan, OMB issued Version 2.0 of its *EA Assessment Framework* in December 2005, an instrument designed to evaluate Executive Branch agencies' progress. Version 2.0 focuses extensively on EA usage and outcomes, and represents a significant departure from earlier versions of the instrument

that primarily addressed the existence and completeness of EA artifacts.

NASCIO launched its *Adaptive Enterprise Architecture Development Program* in 1998, with grant funds from the U.S. Department of Justice, and the organization's publication "Toward National Sharing of Governmental Information" included a national call for architecture. NASCIO's *EA Framework* fosters government information systems integration and comprises a discussion of architecture governance, and business, information, solutions and technology architectures. NASCIO also maintains an *EA Development Tool-Kit* (Version 3.0) and an *EA Maturity Model* (Version 1.3). The Tool-Kit illustrates effective EA methodology and guides EA development in participating states. The Maturity Model reflects the phases and natural progression of benefits an organization will see as their EA program matures, and can be used to benchmark the effectiveness of an EA program.

IFEAD's founder, Jaap Schekkerman, has advanced the concept of *Extended Enterprise Architecture (E2A)* and developed an *E2A Framework*[SM] that extends the EA beyond its original boundaries, defining a collaborative environment for all entities involved in a collaborative process. Companion products include the *E2A Maturity Model*[SM] (E2AMM – Version 2.0) and the *EA Score Card*[SM] *(Version 2.1)*.

The IFEAD maturity model describes the different levels of maturity of an Extended Enterprise. Different viewpoints are used to describe E2A maturity: Business Technology Strategy Alignment; Extended Enterprise Involvement; Executive-Management Involvement; Business Units Involvement; Extended Enterprise Architecture Program Definition; Extended Enterprise Architecture Development; Extended Enterprise Architecture Results; Strategic Governance; Enterprise Program Management; Holistic Extended Enterprise Architecture; and Enterprise Budget and Procurement Strategy. The IFEAD scorecard describes the main lines of a methodology to assess the activities and results of enterprise architects.

Following its acquisition of META Group in 2005, Gartner combined its own EA approach with META's to create the new *Gartner Enterprise Architecture Method* (GEAM). GEAM includes two major facets: the *Gartner Enterprise Architecture Framework*, and the *Gartner Enterprise Architecture Process Model*. The framework defines a "business context" (i.e. business strategy and external trends), and advocates the development of a minimum of three interdependent viewpoints: a business, information and technology viewpoints. The framework also advances the idea of using what Gartner calls an *Enterprise Solution Architecture Framework* (ESAF) to help in the creation of enterprise solutions within the *Enterprise Solutions Architecture* (ESA). The process model is a multiphase, iterative, nonlinear model focused on EA process development, evolution and migration, along with governance, organizational and management sub-processes.

Prior to the acquisition, META Group maintained an *Architecture Maturity Assessment* instrument (AMA – 2002 version) to help practitioners assess their EA program on key effectiveness indicators. (Note: In

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November 2005, Gartner published research that addresses assessing the maturity of EA programs and revises its position on the details of an AMA instrument.*)* AMA can be used to assess the current state of maturity, help analyze constraints and set explicit maturity targets for growth.

According to ITGI, "IT governance is the responsibility of executives and the board of directors, and consists of the leadership, organizational structures and processes that ensure that the enterprise's IT sustains and extends the organization's strategies and objectives." ITGI addresses several IT governance domain practices and competencies: strategic alignment, value delivery, resource management, risk management and performance measurement.

ITGI's *Control Objectives for Information and related Technology* (COBIT® – Version 4.0) provides a comprehensive single source of consistently defined IT processes, control objectives and practices, management guidelines and RACI charts (identifies who is Responsible, Accountable, Consulted and/or Informed) in the process for the control of information and related technologies throughout their lifecycle. While COBIT® does not singularly focus on enterprise architectures, the material can provide a valuable resource to the EA practitioner. (Note: Several control objectives are immediately pertinent to the control and review of EA programs: ME4–Provide IT Governance, PO1–Define a Strategic IT Plan, PO2–Define the Information Architecture, PO3–Determine Technological Direction, and PO6–Communicate Management Aims and Direction.) COBIT® also provides maturity models for benchmarking and performance goals, and metrics to measure internal process performance based on balanced scorecard principles. COBIT® products are designed to support executive management; business and IT management; and governance, assurance, control and security professionals.

Additionally, the Government Accountability Office (GAO) also issued an *Enterprise Architecture Management Maturity Framework* (EAMMF). The oversight organization uses this framework when reviewing agency EA programs. GAO considers the EAMMF an extension to *A Practical Guide to Federal Enterprise Architecture* (Version 1.0) published by the CIO Council in 2001 (the Guide), and EAMFF must be used in tandem with the Guide. Because EAMMF does not offer evaluation methods, GAO developed companion survey instruments to assess an agency's maturity level against the EAMMF. For example, in 2005, GAO developed a *Survey of Federal Departments' and Agencies' Enterprise Architecture Efforts* to conduct its review of agencies' progress against the EAMMF. GAO did not separately publish the survey instrument.

Unique Perspectives and Contributions

This review identified differences in each organization's approach to enterprise architecture. The following observations were made:

Extended Enterprise – IFEAD makes a compelling case for an "extended" enterprise architecture, whereby the entire value chain is considered part of the "enterprise" and is addressed within the EA framework and maturity model. In the context of E2AF, "enterprise" is defined as any collection of organizations that has a common set of goals and principles and/or a single bottom line. Other models generally consider stakeholders' involvement and customers, but fail to systematically include the full value chain as a component that needs to be explicitly documented in the EA.

Federated Enterprise and Information Sharing – While several models address the question of federated architectures, reuse and interoperability, NASCIO offers a unique perspective based on actual federated practice. NASCIO's experience is directly pertinent to the needs of federal agencies: fostering the use of EA to support the business of government, enabling information sharing across traditional barriers, enhancing government's ability to deliver effective and timely citizen services, and supporting agencies in their efforts to improve government functions. It was also noted with interest that version 2.0 of OMB's Assessment Framework makes reference to the NASCIO Maturity Model.

Primitives and Composite Pictures – Gartner's discussion of the need for an "enterprise solution architecture framework" (ESAF) to guide the creation of enterprise solutions appears unique in its explicitness. While Zachman stresses that enterprise architecture is the set of primitive, descriptive artifacts and constitutes the knowledge infrastructure of the Enterprise (Zachman, ZIFA-1), Gartner notes that much of the work of enterprise architects to date has been focused on dividing the modeling challenge into small problems (the various viewpoints and levels of abstraction) with little attention paid to providing a methodology or framework for their unification into enterprise solutions. Gartner's ESAF in particular would explicitly guide the enterprise and solutions architects in combining and reconciling different viewpoints, and in synthesizing a unified enterprise solution architecture that satisfies the concerns of the stakeholders. (James, et al. 2005. Gartner G00130855)

EA Program Dimensions – Conveying Assessment Results – GAO is the only maturity model that requires meeting a given maturity level on <u>all</u> dimensions of review in order to be assessed at that level. All other organizations offer models that permit and even encourage the organization to assess the level of maturity separately against each dimension identified. Several compute an aggregate/average score as an additional overall metric, based on the individual results. The META Group's AMA instrument displays results of its assessment of ten key indicators/metrics in a Kiviat Diagram (aka a "radar chart"). Such a diagram provides a powerful graphical representation of all metrics values for the organization. (Note: *ProfilerPro,* an online survey development and collaboration tool developed by the University of Kansas, offers effective means to design metrics, develop online survey instruments to assess progress against the metrics, and present the results in a Kiviat Diagram format. This or other tools could be used to profile EA program growth. (For a demonstration, visit http://profilerpro.com/faq.jsp).)

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<u>IT Governance & Balanced Scorecards</u> – When reviewing the ITGI material, it was noted how the goals of IT governance, and thus of COBIT®, are remarkably consistent with the purposes for establishing a mature EA program within the organization. According to ITGI, COBIT® supports IT governance by providing a framework to ensure that: IT is aligned with the business, IT enables the business and maximizes benefits, IT resources are used responsibly, and IT risks are managed appropriately. Similarly, balanced scorecards support effective IT governance by offering a comprehensive view of the enterprise's goals, including financial, customer, internal and innovation perspectives (see also Van Grembergen).

Ongoing Growth through Exploration and Self-Assessment

IT governance and enterprise architecting are evolving disciplines that can help ensure that information and related technologies provide optimum value to the business. Establishing an EA Program assessment instrument that is consistent with balanced scorecard principles is essential to growth, as well as to demonstrating to others the usefulness of such a program.

Although agencies are required to comply with the FEA blueprint and use the OMB EA Program Assessment Framework and these efforts alone will be time consuming, federal EA practitioners should explore several EA frameworks, metrics and self-assessment instruments, using the material presented in this paper and other sources. (Note: Starting in 2006, OMB will use v.2.0 of the assessment framework each spring to conduct a formal review of each agency's progress. Agencies must also apply the framework as a self-assessment tool on a quarterly basis and report to OMB. Results will provide a foundation for the President's Management Agenda (PMA) e-Gov Scorecard "Status Score" and "Progress Score" respectively.) Much information is readily available on the Internet and there are formal and informal opportunities to learn.

There is significant relevance to the federal EA practitioner in describing the entire enterprise value chain, developing truly federated architectures, carefully building solutions out of primitive components, effectively presenting assessment results, and managing EA programs in the broader context of IT governance.

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Key Resources

OMB EA Assessment Framework (v.2.0),

FEA 2005-2006 Plan, E-Gov Site, PMA Site

http://www.whitehouse.gov/omb/egov/a-2-EAAssessment.html

http://www.egov.gov

http://results.gov

NASCIO Adaptive EA Development Program, Tool-Kit (v.3.0) and Maturity Model (v.1.3)

http://www.nascio.org/nascioCommittees/ea/

IFEAD E2A Framework[SM], E2AMaturity Model[SM] and EA Score Card, and other resources

http://www.enterprise-architecture.info/

Gartner EA Method & other resources*

http://www.gartner.com/

ITGI COBIT® (v.4.0), CEO's Guide to

IT Value at Risk & other resources*

http://www.itgi.org/

http://www.isaca.org/Content/ContentGroups/CoBIT2/C_small_OBI_small_T_4_0_Frequently_Asked_Questions.htm

GAO EA Management Maturity Framework (v.1.1–GAO-03-584G), CIO Council EA Guide http://www.gao.gov/new.items/d03584g.pdf

http://www.cio.gov/archive/bpeaguide.pdf

* Some resources require subscription or membership.

RFID and the Military Commander

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One of the biggest challenges for a military commander is to effectively utilize all his people and equipment. This difficult task becomes even more important during a military deployment. The most successful commanders find a way to master this task and accomplish the unit mission. Others fail while wasting time, money and resources. A commander's success rate could be greatly improved, however, if the military would better utilize some readily available technology. One technology military personnel are very familiar with and technology industry is using with great success is a web-based radio frequency identification (RFID) system.

As an Air Force Civil Engineer Squadron Commander, I was responsible for over 550 personnel and $2.3 billion in assets and property. It was a great job…and often a daunting task. Because I was accountable for the success or failure of my unit, I needed to know what squadron members were doing, which required I spend a large part of every week tracking people, projects and equipment. When I deployed to Iraq with 100 airmen, we were joined by 60 additional airmen from 25 different squadrons to form the 506 Expeditionary Civil Engineer Squadron. Although the unit was smaller, my job of managing resources did not get any easier. Fortunately, I had 7 days a week to get the job done. Unfortunately, most of the resource tracking was done by hand – the same way it had been done for years. Even though we had computers, phones and the Internet at our deployed location, I used very little automation and technology. That's too bad, because a web-based radio frequency identification system would have been exceptionally useful while preparing for the deployment, while deployed, and during the trip home.

Preparing for a Deployment

As a unit prepares to deploy, military personnel must complete countless hours of training (weapons qualification, chemical defense, first aid, etc.) and an endless number of medical and dental appointments. As they complete all these tasks, confirmation information is given to the member, who must pass it on to the readiness officer, who must then pass it on to the commander. The commander needs this information to ensure his unit is "battle ready." The more people that deploy, the more this process consumes the unit. Prior to my deployment, I received countless updates on every one of the 100 people accompanying me to Iraq and the 35 personnel going to other deployed locations. In the weeks before we departed, I was getting daily briefings on the status of unit personnel. While this was happening, I also had to complete my required training, continue to support wing personnel that were not deploying, and help solve problems for individuals struggling to get their affairs in order. Needless to say, it was a challenge.

This challenge could have been eased if all the training and medical status would have been tracked on a web-enabled radio frequency identification (RFID) system. RFID systems are not new. In fact, the technology has been used by industry for years, and the military began using it in the 1990s. RFID refers to an automatic identifica-

tion method relying on storing and remotely retrieving data using tags. The tags are small objects attached to a product or person, and which provide information about that item through a receiver. Even if you did not know it, you've seen RFID systems for years in public libraries (visit http://www.ala.org/ala/pla/plapubs/technotes/rfidtechnology.htm). In this application, books are fitted with a tag and security gates detect whether or not the book has been properly checked out. When you and I return the book, the tag is scanned and the library database is automatically updated. Not only does the RFID system help the librarian, it allows you and I to check on the status of our favorite books on-line, before we even leave for the library.

This same type of system would greatly enhance a commander's ability to track personnel and equipment. Imagine if all personnel and equipment data was loaded onto RFID tags. Equipment could be tracked and inventoried as easily as a library book. And tags carried by military members would do the same for personnel. However, I recommend the military adopt a wrist band system similar to the one being used by the Philadelphia Eagles to manage snow removal at Lincoln Financial Field because I don't think the ear-tag system will be well received by personnel. Coincidentally, this same snow removal work is accomplished by civil engineers across the Air Force so there is certainly an opportunity for peacetime military applications.

Once the personnel tags are in place, training and medical data would be updated following each appointment. This data would immediately be available to the commander while negating the need for manual updates or meetings with the member and the readiness officer. And by web enabling the system, this information is available to the commander all the time. The only limitation is web access. The other benefit of this system is that it allows the commander to track the status of personnel deploying with him from other locations. In my case, over 1/3 of my deployed unit was not from my home base. I had no idea who these people were until I met them in Iraq. If, on the other hand, I had a web-based RFID system with personnel data, I would have been able to monitor these personnel as well as those from my home unit. This should be a secure access web page much like I have with my on-line bank accounts.

During a Deployment

Another challenge for a commander is tracking the status of unit personnel while en-route to a deployed location. In my case, my senior non-commissioned officers and I left for Iraq about a week before the rest of the unit. This is often the case since it allows time for the leadership of the departing unit to conduct a changeover brief before the full unit arrives. Unfortunately, once the commander deploys, he often loses all visibility of his personnel. This is exactly what happened to me. I lost all contact with my unit and was unaware they were delayed in theater due to aircraft trouble and a rocket attack. I knew they did not show up…but I did not know why until they arrived three days later. Again, a successfully integrated web-based RFID system would track the status of per-

RFID (Cont.)

(Continued from page 9)

sonnel as they traveled into the theater, providing the commander with better situational awareness.

This same web-enabled RFID system would also be a great tool for the commander at a deployed location. Again, I spent a large part of each week trying to keep track of personnel, supplies and equipment. It's a strange phenomenon that equipment disappears on a deployment…and it's often difficult to locate. This phenomenon may occur less often, however, if all the equipment was identified with an RFID device so it was easier to find and return home. And the web-enabled feature would allow commanders to better track use of deployed tools and equipment and even provide this information to replacement units so they knew which tools and equipment were most critical. The same thing can be done for personnel specialties.

But probably more important in a hostile environment, RFID devices would be a huge advantage when conducting personnel accountability. While I was deployed, the base experienced about 2 to 3 rocket attacks each week. Following each attack, we spent anywhere from 2 to 6 hours getting 100 percent accountability of every member on the base. It sometimes took a long time because people were often working or sleeping when the attack occurred and our accountability system required an "in-person" head count. In these cases, we could spend hours combing the base in search of the missing person -- who was usually safe and sound.

An RFID system that tracked personnel movement would greatly reduce the problem…at least with Air Force personnel often confined to the installation. Even if the person was not at the unit where they could be counted in person, they would only need to find someone on the installation with an RFID receiver. Once counted, the unit would have a positive ID and accountability. But if someone was still missing, the web-based database would allow the commander to know exactly who was missing without having to ask for names over the radio or phone. The system would be incredibly beneficial.

Returning from a Deployment

The unit and the commander would see the same benefits from a web-based RFID system during the return home. Personnel status and arrival times could be tracked even if the unit had to be split into groups of 4 or 5 to accommodate military or civilian aircraft. Without this system, I was constantly "surprised" by people returning from deployments who did not bother or were unable to call when they got an early flight home. This often meant they were stranded at the airport while we looked for a vehicle to run to the airport…or they were picked up by a family member and we never knew they returned.

Challenges with a Web-based RFID system

As good as it sounds, there are certainly challenges with implementation of a web-based RFID system. The first is availability of Internet service, particularly while traveling. This could be an issue, particularly when deploying to remote locations. But even if Internet service is unreliable or unavailable at the deployed location, the system could still be in place at home station and at major transportation hubs during travel. Take Iraq for example. Even if Internet service is not available at every installation, it could still be installed at Al Udeid where it would provide reliable data for most people going into or out of the theater (and it would certainly be better than what they use now – grease pencils and waiting). Even if Internet service does not exist at the deployed location at first, it will likely be available some time during the deployment.

Another issue or challenge is the cost of a system. Many people have a vision of RFID tags and readers so inexpensive that nearly every product will be tagged through the entire supply chain. But we're not there yet. They still cost money to purchase and replace. DoD knows this since they have been using RFID tags since the 1990s and a March 2006 GAO report says our current policy does not efficiently use/reuse tags. They recommend a policy change that could avoid millions in unnecessary purchases. But until the policy is changed, GAO will likely frown on additional RFID purchases.

A final concern is over privacy of personnel. There will certainly be those that see the tag as an invasion of their privacy. Even when deployed to a combat zone, people enjoy having some personal time. But as long as they are wearing an RFID, they will think they are being watched by "them." There is no way to change this perception or to keep people from removing their tags – even if we used the tag in the ear method discussed before. But I expect most people will see the benefit of accountability and if a few good examples prove the worth, people will be much more accepting of the tags.

But these challenges can be overcome and the technology is working. RFID has the potential to solve one of most difficult challenges a military commander must face – accountability of resources provided to him by America citizens and taxpayers. Whether it's sons and daughters or tools and equipment, the better these resources are tracked the more likely a commander will successfully accomplish the unit mission. The most successful commander finds a way to do this, but using tools like a web-based radio frequency identification system will certainly improve the odds.

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Marketing Information Assurance

By Les Pang, IRMC Professor

The involvement of senior management with the information assurance responsibility is instrumental in achieving a sound and successful security program. By having this upper management involvement, employees, partners and other stakeholders can realize the serious nature of the issue and act accordingly. In addition, executive commitment should lead to redirecting resources toward this critical area.

Unfortunately, research findings indicate that the security issue is not reaching the top layers of organizations or, when it does, only at irregular intervals and on an ad-hoc basis. These failures and inconsistencies can result in potential security problems which can negatively impact the organization.

This article explores a variety of strategies and techniques a manager can use to encourage upper management to take a greater role in information assurance:

Fear, Uncertainty, Doubt (or "FUD"). Vendors often use this approach to help sell their product or service. They instill a sense of FUD in the minds of consumer by focusing on the underlying threat or by citing the weaknesses of their competitor's product. FUD may be effective when it is timed after some catastrophic event. However, it has some major shortcomings -- for example, it cannot be used repeatedly as in the boy who cried "wolf" too many times.

Classical Market Techniques. Marketing is much more than selling. Marketing is the set of activities used to:

1. Get your potential customer's attention (e.g., alert them of security concerns)

2. Motivate them to act (e.g., have them consider implementing security safeguards)

3. Get them to actually act (e.g., acquire safeguards)

4. Get them to act again (and again…) (e.g., maintain continual vigilance against intrusions)

Marketing is also how you define your product, promote your product, distribute your product, and to maintain a relationship with your customers. Marketing theory is made up of the 5 P's: Product, Positioning, Place, Price, and Promotion.

Rewards System. The essence of marketing security involves letting others know "what's in it for them" because it is human nature to be motivated by personal reward. There are many types of personal rewards: Career advancement, financial, material reward, peer recognition, personal self-satisfaction, risk reduction, and avoiding trouble.

If you don't market yourself, someone else will."

It is important to find the "right button" to push.

Targeting. The audience is not homogenous and consists of different clusters of target groups. These target groups include, but are not limited to: internal staff, end users, line of business heads, executive management, the board of directors, and vendors and partners. Each market group needs to be marketed differently with unique messages.

Awards. Winning and publicizing awards is the most common and effective marketing tactic. Awards confer on the organization a third-party seal of approval.

Conversely, one effective marketing technique is sponsoring awards. One example is awarding a "spirit of security" award every month to departments.

Think Thematically. Select an annual theme to drive the year's communication such as "Moving Security to the Next Level" or "Finding the R in ROI." Sub-themes could include investing for growth and increasing agility.

Brand Security. Because IA can seem complex, confusing or just plain dull to those outside, putting a meaningful brand name on an initiative can help security executives convey the value in a concise, accessible and memorable way. In fact, a CIO magazine survey revealed that branding specific projects or services is among the most effective and popular marketing practices.

Get Face Time. If you think of IA as a brand, then the Chief Information Security Officer (CISO) is its spokesman. Therefore, CISOs must get in front of their constituents and "sell" the brand on a regular basis. Schedule one-on-one reviews with management committee members and recount what he said IA would do and what it actually did during the past three months. The CISO should review and validate the priorities for the next three months.

Keeping score. Using service-level metrics and audit data is another common form of marketing, and scorecards are often the vehicle of choice. The danger with scorecards, though, is that organizations can devote a lot of resources to reporting metrics that are meaningless to their business counterparts.

Storytelling. One needs to be sure that the stories are community-driven rather than built around scare tactics. Attempt to incorporate everyone in the same narrative and convince people that we are in this together. One best practice is for people within the corporate community to tell some of their stories and evangelize for you.

Marketing Information Assurance (cont.)

Understand the Economics of Security. One security expert produced a worldwide security cost/benefit analysis for his corporation. It proved the value of security by showing that it added to the bottom line.

Conclusions

Managers who are squeamish about marketing need to get over it and fast. One expert says "I don't think you have a choice. *If you don't market yourself, someone else will.*" And you might not like the image given to you.

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EVM (cont.)

work within the schedule indicated?

More importantly, senior management must be prepared to make tough decisions if the answer to any of these questions is "no." "Try harder" should no longer be acceptable.

Conclusion

Implementation of EVM is not easy, but that's because project management is not easy. It can provide accurate information on project status, whether it is used to measure contractor costs, in-house costs, or both. However, it should be implemented wisely, where it makes sense, and not purely in reaction to direction from OMB, but because, on a given project, it is the right tool to use to improve project performance.

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