A Summary of First Practices and Lessons Learned

In Information Technology Portfolio Management


Understanding the Differences


Gain Commitment


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Communicate Goals and Objectives


Acquire and Utilize Methodologies and Tools


Routinely Collect and Analyze Data


Consider Customers and Stakeholder


Inter-Organizational Aspects of the IT Portfolio

CIO COUNCIL

Prepared by the CIO Council

Federal CIO Council
Best Practices Committee

Letter from the Co-Chairs

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In October 2001, the Federal Chief Information Officer Council was restructured to improve the coordination, integration, and operation of information management and technology practices across the Federal Government. The Council now includes three standing committees focusing on Workforce and Human Capital for IT, Federal Architecture and Infrastructure, and Best Practices. As co-chairs of the newly formed Best Practices Committee, we are pleased to release our first report, entitled "A Summary of First Practices and Lessons Learned in Information Technology Portfolio Management." This report is the first in a series of publications that will provide members of the Federal IT community with in-depth examples and practical guidance to successfully formulate, manage, and maintain their organizations' IT portfolio.

The President's FY 2003 Budget requests $52 billion for investments in Federal Agency information technology (IT) professionals, initiatives, and office operations. With the practice of sound capital planning and investment control, the investment in IT will continue to streamline, transform, and significantly improve Government operations and the delivery of goods and services to the public. The primary objective of this document is to provide lessons learned and insights from leading IT portfolio management practitioners to Government officials, budget and planning specialists, program managers, and the Federal and contractor communities that help to execute Government functions.

We believe that the information presented within this report can help organizations whose capital planning and investment control processes are in various stages of maturity. For the organization that is just starting out, the lessons learned and insights should help to focus efforts on the areas that are truly important and to avoid the problems and pitfalls that others have experienced. For the organization that has implemented, but not yet fully institutionalized their capital planning and investment control process, the report should help to further advance their approach and address specific issues that may be impeding their progress toward the effective management of their IT portfolio. And, finally, for the organization that has fully implemented and institutionalized their capital planning and portfolio management program, this report is intended to provide an assessment framework to help it fine tune its policies, processes, and practices.

We would like to extend our gratitude to the Industry Advisory Council and Best Practices Committee volunteers, who were instrumental in putting this report together. In closing, we hope that you will find the report to be informative and useful. Please let us know, as we very much welcome your comments.

Debra Stouffer and Sue Rachlin
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$52 Billion is A Lot of Money

Let's start this report here . . .

For FY 2003, the President has requested $52 billion for investments in information technology. Anyway you look at it, $52 billion is a lot of money.

Recognizing there are many IT buyers and spenders operating under different "drivers" within the Federal Government is a good first step.

WHAT IS THE PROBLEM?

Federal direction, policy, and guidance as well as the best efforts of Government oversight and technical review organizations have brought a portion of much needed control in IT planning and spending. However, significant improvements are still needed as we plan on how we spend this $52 billion investment.

Determining what to invest in, how much to invest, and then taking action to maximize the value of the return on our investment tends to be a bit more difficult. Why?

First, according to Mark Forman, OMB's Associate Director for IT and e-Government, "Many agencies fail to transform their process for IT management using the portfolio management process because they don't have change management in place before starting. IT will not solve management problems – re-engineering processes will. Agencies have to train their people to address the cultural issues. They need to ask if their process is a simple process. A change management plan is needed. This is where senior management vision and direction is sorely needed in agencies."

Second, the selection criteria for IT spending varies greatly between and within government agencies. People use different requirements, goals and objectives, preferences, tolerances for risk and uncertainty, levels of acceptance of quality, and bases of knowledge and understanding to make spending decisions.

Third, people who are buying and spending IT money often are not aware of what other people are buying and spending. Without a broader perspective, many will not make investment decisions based on the common good. This reduces the chance that the next dollar of IT spending will generate the best possible benefits. Is there a Solution at Hand?

IS THERE A SOLUTION AT HAND?

Yes. Thankfully, there is. Recognizing there are many IT buyers and spenders operating under different "drivers" within the Federal Government is a good first step. The next step is to make people aware of and embrace the concept of portfolio management within their organizations.

WHAT IS PORTFOLIO MANAGEMENT?

There is a lot of history behind portfolio management and much of it is well worth the time and effort to review. The following brief history provides a starting focus point for the main purpose of this document: to provide you with lessons learned and insights from leading IT portfolio management practitioners.

A Brief Historical Overview of Portfolio Management

1952 – The management of information technology projects, according to portfolio management tenets, owns its origins to **Modern Portfolio Theory** (MPT). MPT first was described by **Harry Markowitz** in his seminal paper entitled, *Portfolio Selection*, which appeared in the Journal of Finance.

In brief, MPT describes how, for a given risk level, there is a specific mix of investments that will achieve an optimal return. Of course, a critical assumption here is that the investors know what they are seeking – typically more, less, or the same level of performance or some other measurable objective.

Interestingly enough, thirty-eight years later in **1990**, Markowitz shared a Nobel Prize with Merton Miller and William Sharpe for what has become the dominant approach used to manage risk and return within financial markets.

Fast forward to . . .

1981 – In light of the increasing use and criticality of IT to business operations and success, **F. Warren McFarlan** applied MPT to the management of IT. McFarlan prepared an article published in the Harvard Business Review entitled, *Portfolio Approach to Information Systems*. In his article, Professor McFarlan suggested that managers employ a **risk-based approach to the selection and management of IT projects**. By explicitly understanding the nature of the risks, managers can allocate their resources appropriately to mitigate the risk or can delay taking other risks in order to keep the overall risk at a manageable level.

A broader use of the ideas of portfolio management began to develop in the mid-1990s.

1994 – GAO's report entitled, *Improving Mission Performance Through Strategic Information Management: Learning from Leading Organizations*, described a private sector organization that used a portfolio investment process to **select, control and evaluate** information systems projects.

The organization defined and applied an explicit set of decision criteria that addressed the benefits, costs, and risks associated with a number of competing investment opportunities.

The organization believed that use of the portfolio process helped it to determine the best mix of projects.

The organization believed that use of the portfolio process helped it to determine the best mix of projects and the right level of investment to make in each of them. One important outcome was to achieve a better balance between the investments it made in ongoing maintenance expenditures versus strategic initiatives.

1998 – GAO continued to promote IT portfolio management in its report entitled, *Executive Guide: Measuring Performance and Demonstrating Results of Information Technology Investments*. According to many, the report is a runaway bestseller. It describes **portfolio management and analysis** as one of four strategic enterprise objectives.

Also in the same year, **John Thorp** published "The Information Paradox," which described portfolio management as one of three fundamental components of **"benefits realization."** Thorp provided case studies in which portfolio management was used to manage risk and maximize return along a number of dimensions. His risk dimensions included technology as well as organizational capability. He also addressed the advantages to be gained by evaluating projects in light of the other projects being considered. Thorp went on to describe the rudimentary steps to creating a portfolio.

Present -- More recently, both GAO and OMB explicitly included IT portfolio management as central elements of good IT investment management. GAO's IT Investment Management Framework places portfolio management at the center of its model of investment management. While strong investment decision-making provides a foundation to maximize returns, it is only when IT investments (all funds being committed to IT programs, projects and systems for the benefit of the Agency) are managed as a portfolio can an optimal return even be approached.

OMB's revision of Circular A-130 in 2000 also referred to portfolio management as a critical aspect of capital planning and specified its use in the process. OMB noted that, "The portfolio will provide information demonstrating the impact of alternative IT investment strategies and funding levels, identify opportunities for sharing resources, and consider the Agency's inventory of information resources."

What should we take away from the History of Portfolio Management?

At its core, portfolio management describes the processes, practices and specific activities to select IT investments. Portfolio Management makes use of continuous and consistent evaluation, prioritization, budget considerations and finally selection for the greatest value and contribution to the strategic interests of the organization.

Through portfolio management, the organization can explicitly assess the tradeoffs among competing investment opportunities in terms of their benefits, costs, and risks. Investment decisions can then be made based on a better understanding of what will be gained or lost through the inclusion or exclusion of certain investments.

In the simplest and most practical terms, portfolio management is about the five following items:

1. Defining goals and objectives – clearly articulate what the portfolio is expected to achieve.

2. Understanding, accepting, and making tradeoffs – determine how much to invest in one thing as opposed to something else.

3. Identifying, eliminating, minimizing, and diversifying risk – select a mix of investments that will avoid undue risk, will not exceed acceptable risk tolerance levels, and will spread risks across projects and initiatives to minimize adverse impacts.

4. Monitoring portfolio performance – understand the progress that the portfolio is making toward the achievement of the goals and objectives.

5. Achieving a desired objective – have the confidence that the desired outcome will likely be achieved given the aggregate of investments that are made.

As Lester Diamond, Assistant Director of IT at GAO notes, “If you have strong portfolio management, you can explain tradeoffs better; explain why you chose projects; lay out your portfolio of investments; and describe risks and how you plan to manage them. The Hill is especially concerned about results and hates to see dollars going down the tube.”

At this point, it is probably a good idea to shed a bit of light on what portfolio management is not.

It is not about doing a series of project-specific calculations and analyses, such as return on investment, benefit-cost analysis, net present value, payback period, rate of return (internal or otherwise), and then adjusting them all to account for risk. Nor is it

about earned value or activity-based costing. These practices are important, however, they are project-specific.

Portfolio management is not collecting after-the-fact information on IT projects to produce a report that the organization hopes will satisfy some organizational reporting requirement.

That is probably enough for the definition of portfolio management. Hopefully, you get the idea.

THE LAW SAYS THAT WE HAVE TO DO PORTFOLIO MANAGEMENT – BUT WHY DO WE NEED AND WANT TO DO IT?

With regard to the law, there is the Clinger-Cohen Act. Enough said.

However, whether you are a Government official, manager, or member of the staff (Government workers or contractor support) there are other compelling reasons to formulate, manage, and maintain IT portfolios.

Above all else, we need and want to do portfolio management because it will help us to determine an acceptable mix of IT products and services to buy. It will help us figure out how much to spend on those IT products and services. Lastly, it will help us to better employ IT to achieve our mission goals, performance objectives, and to support and enable business operations.

Of course, we also need to recognize that IT is not the only item we are buying to support mission and business purposes. The IT portfolio is part of an organization's broader portfolio of investments, which includes a wide variety of human and capital assets. Whereas the IT portfolio contemplates tradeoffs among IT initiatives, an organization's broader portfolio considers tradeoffs among investments in all "factors of production," including workforce, buildings, equipment, as well as IT.

For an organization's Chief Information Officer (CIO), having a working and effective process to formulate, manage, and maintain an IT portfolio is absolutely critical. Without it, the CIO cannot properly support, substantiate, and fully justify investments in IT against investments in other things.

For other organization officials, such as the Chief Financial Officer (CFO), Procurement Executive, and Office and Program Managers, IT portfolio management is no less important. They all need to have visibility into how and where IT funds are being spent and whether their IT investments are contributing to the achievement of mission, program, and business goals and operations. Indeed, since a great number of IT investments are viewed as potential workforce and performance multipliers, the importance of a sound IT portfolio cannot be overstated.

HOW TO INITIATE OR IMPROVE PORTFOLIO MANAGEMENT WITHIN YOUR ORGANIZATION

Start with the lessons learned and insights presented in this report. Like our contributors, you also may want to start slowly.

Think about the types of IT projects and investments your organization is making. Instead of trying to grapple with the formulation, management, and maintenance of a portfolio for your entire organization, try focusing on one aspect of it. Think about starting with a specific business area or function such as:

- Mission or program area (you will probably want to pick a specific business area)
- Security
- Infrastructure
- Research and development
- Administrative support
- Non-system development

Over time, you can add new portfolios until you have captured all of your IT investments. Employing this type of an approach can facilitate tradeoff analyses across different portfolios. For example, later in this report, we will discuss an organization that was able to determine the need for additional investments in their infrastructure efforts to keep pace with and adequately support their mission, program, and business operations.

Other organizations interviewed for this report noted a legacy of rather excessive and unnecessarily redundant spending on IT infrastructure. The leading organizations we spoke to use portfolio management and their IT capital planning and investment control process to make adjustments to their infrastructure spending.

Another thing you can do to get started down the right path is to contact the Federal CIO Council for advice and assistance. Let them know what you are trying to accomplish and the issues and challenges that you are facing and they will point you toward the organizations and people who can help.

Lesson 1. Understand the differences and the relationship between portfolio management and project management and manage each one accordingly.

An IT portfolio is comprised of a set or collection of initiatives or projects. Project management is an ongoing process that focuses on the extent to which a specific initiative establishes, maintains, and achieves its intended objectives within cost, schedule, technical, and performance baselines.

Portfolio management focuses attention at a more aggregate level. Its primary objective is to identify, select, finance, monitor, and maintain the appropriate mix of projects and initiatives necessary to achieve organizational goals and objectives.

Portfolio management involves the consideration of the aggregate costs, risks, and returns of all projects within the portfolio, as well as the various tradeoffs among them. Of course, the portfolio manager also is concerned about the “health” and well being of each project that is included within the organization’s IT portfolio. After all, portfolio decisions, such as whether to fund a new project or continue to finance an ongoing one, are based on information provided at the project level.

CASE EXAMPLES: OFFER TRAINING ON KEY TOPICS

The Department of Housing and Urban Development (HUD) has established a fairly comprehensive training program for its IT portfolio and project managers that clearly distinguishes the roles, responsibilities, and activities to be performed by each. The training is readily available and portable to other Federal organizations. The Department of Agriculture (USDA) has adopted, tailored, and implemented it to support their IT portfolio and project management activities.

Lesson 2. Gain and sustain the commitment of Agency officials and senior managers to make informed IT investment decisions at an enterprise level and to uphold them.

The successful management of your IT portfolio requires strong leaders who recognize and understand the value of IT to the organization and the benefits that accrue from an IT portfolio management approach. Each of the public and private sector entities interviewed indicated that their organization provided executive leadership to the portfolio management process. The level of executive leadership most often tied to the clearly defined governance process was the Chief Executive Officer (CEO) or Agency Head. These leaders would participate in decisions for large or high-impact capital investments.

Within the Federal Government, Mark Forman at OMB reminds us that, "the Clinger-Cohen Act specifically mandates senior executive involvement in Agency IT decision making. The Clinger-Cohen Act directed a regulation to be crafted by the Secretary or Deputy Secretary laying out portfolio management and [capital planning and investment control]."

Portfolio management requires a business and an enterprise-wide perspective. However, IT investment decisions must be made both at the project level and the portfolio level. Senior Government officials, portfolio and project managers, and other decision makers must routinely ask two sets of questions.

First, at the project level, is there sufficient confidence that new or ongoing activities that seek funding will achieve their intended objectives within reasonable and acceptable cost, schedule, technical, and performance parameters?

Second, at the portfolio level, given an acceptable response to the first question, is the investment in one project or a mix of projects desirable relative to another project or mix of projects?

Having received answers to these questions, the organization's senior officials, portfolio and project managers, and other decision makers then must use the information to determine the size, scope, and composition of the IT investment portfolio. The conditions under which the portfolio can be changed must be clearly defined and communicated. Proposed changes to the portfolio should be reviewed and approved by an appropriate decision making authority, such as an investment review board, and considered from an organization-wide perspective.

Case Examples: Cultural Changes

The interviewees described a shift in culture, process, and responsibility (for identifying and delivering business value) from the IT organization to the business end-user. Further, a senior executive representing the business function normally participates on cross-functional teams or boards.

The interviewees described a shift in culture, process, and responsibility from the IT organization to the business end-user.

The Office of Personnel Management (OPM), a relatively small Government organization with a limited portfolio, noted its size allows for easy access to key executives, making portfolio management easier for them than for some larger organizations.

Ingram Micro describes this fundamental change within their company philosophy: “We are moving from a centralized IT organization focused with a technology driven IT portfolio to a business capability driven IT portfolio.”

In making this shift, Ingram Micro moved the responsibility for identifying needs, justifying investments, approving technical solutions, and delivering business value from the CIO to Regional Vice Presidents and Corporate level business end-users.

Similar shifts from the IT organization to business owners, for aligning investment proposals with strategic agendas, were addressed in several Government enterprises including the Customs Service and Bureau of Land Management (BLM), as well as in private sector companies such as EDS and SRA.

At GE Global eXchange Services, IT decisions are the responsibility of the business units and sponsors. The sponsor, as the functional leader, is required to present the business case for the requirement as well as fund, justify, and review the project.

Lesson 3. Establish and maintain an enterprise architecture to support and substantiate IT investment decisions.

Many of the leading IT portfolio managers and decision makers interviewed noted a strong reliance on their organization's enterprise architecture (EA) to provide a better understanding of IT investment opportunities and impacts.

More specifically, in several instances such as at HUD, the Department of Labor (DOL), and the Department of Education (DoED), the EA provided IT portfolio managers and investment decision makers with a useful framework to assess opportunities within and across the organization's mission areas and business lines. The EA also is being used to help formulate and target investments to improve data and information management and sharing, application development and deployment, and the ongoing operation and maintenance of the organization's technology infrastructure.

Since many Federal organizations are now just beginning to define their EAs, a useful "first practice" mentioned by several Government and private organizations is to develop an inventory of existing systems and current or planned IT projects.

CASE EXAMPLES: THE ENTERPRISE ARCHITECTURE

EDS is a strong proponent of EA and believes that it is "vitally important to the portfolio process." They stated that an architecture must be in place before investment decisions can be made in a factored way. They also believe that the organization must understand how each part of the organization operates, so that it can determine what each investment contributes to the organization.

EDS believes that an architecture must be in place before investment decisions can be made in a factored way.

Ingram Micro is also moving towards an EA to help manage their IT portfolio. Like EDS, Ingram Micro developed a baseline of its assets and capabilities ("as-is" architecture) as the first critical step. From there they are gaining an understanding of the current portfolio, details of their processes, and systems required in order to develop a roadmap for future investments.

Within the Federal Government, HUD relies heavily on its EA as a major component of its portfolio management process. The EA is integrated with HUD's capital planning process and is used to identify performance gaps, redundancies, and opportunities. Based on EA analyses, gaps are identified and initiatives are proposed to improve

business processes. After each portfolio review, the EA is updated to reflect the enterprise's most current "to-be" state.

BLM is another Government enterprise relying on its EA to guide future IT investments. BLM's EA consists of a technical architecture that is "owned" by the CIO and a business architecture, which is a set of sophisticated process models, jointly "owned" by the Assistant Director's, CFO, and CIO. Under the CIO, a manager titled the Enterprise Architect, is responsible for maintaining the Bureau's EA.

BLM manages all investments to be consistent with the EA and all investments must be compliant with the EA to receive funding. To ensure this compliance and eliminate system duplication, BLM established the System Coordination Office (SCO), whose role is to review and approve all proposals before they are presented to BLM's National Information Technology Investment Board for funding consideration.

CASE EXAMPLES: THE INVENTORY OF SYSTEMS AND IT PROJECTS

The Defense Logistics Agency (DLA), among other organizations, began by inventorying investments to understand its baseline. This allowed the Agency to understand how much it was investing in legacy systems and how to reduce that investment. Government and industry alike strive to reduce dollars tied to operations or backbone infrastructure projects in order to reallocate funds to strategic or constituent serving projects.

According to GE Global eXchange Services, the inventory also clearly shows areas of duplication or redundancy. The reduction of projects or systems allows for cost savings.

AXA/Equitable cited a similar need to not only understand its inventory of systems, but what those systems were delivering for the organization as the basis for its portfolio management process.

Lesson 4. Integrate IT portfolio management with the organization's planning and budgeting policies, processes, and practices.

Most leading organizations manage and maintain their IT portfolios by leveraging their strategic planning, budgeting, acquisition and procurement, and IT capital planning and investment control processes. This helps provide the necessary governance and incentive structure to ensure that portfolio management is integrated throughout the organization. This ensures the stages and steps used to formulate, manage, and maintain the IT portfolio are consistent and repeatable.

CASE EXAMPLES: INTEGRATION

Large private organizations such as GE Global eXchange Services, Oracle and Lockheed Martin noted that having a governance structure that is well documented, effectively communicated, and understood throughout the organization is critical in implementing portfolio management.

To varying degrees of success and maturity, HUD, DOL, DoEd and the Department of Treasury have integrated their portfolio management, IT capital planning and investment control, and budget formulation and execution processes.

Lesson 5. Clearly define and communicate the goals and objectives to be served by the IT portfolio and the criteria and conditions for portfolio selection.

The performance of your IT portfolio affects a wide range of customers and stakeholders within and outside of your organization. Most of the top IT portfolio managers who contributed to this report stressed the following “needs”:

- Adequately define and broadly communicate the goals and objectives of the IT portfolio;
- Clearly articulate the organization's and management's expectations about the type of benefits being sought and the rates of returns to be achieved;
- Identify and define the type of risks that can affect the performance of the IT portfolio, what the organization is doing to avoid and address risk, and its tolerance for ongoing exposure; and
- Establish, achieve consensus, and consistently apply a set of criteria that will be used to select among competing IT projects and initiatives.

CASE EXAMPLES: GOALS AND OBJECTIVES

Private sector organizations including Oracle, Lockheed and GE Global eXchange Services indicated that a short payback period was a key criterion for investment selection.

EDS, GE Global eXchange Services and Oracle focus heavily on evaluating cost reductions in the payback model. The payback period is often linked to the economic environment as well as competitive pressures within their respective industry.

At EDS, achieving value is key. This is measured by cost savings, cycle-time improvements, faster time-to-market, and enhanced ability to focus on core competencies through innovative use of IT.

In alignment with the business case evaluation, BLM’s National Information Technology Investment Board selects investments based on a number of criteria. These include support to BLM’s core business functions, improving work processes to reduce cost and

improve effectiveness, return on investment (ROI), consistency with Bureau enterprise architecture/strategic alignment, and project risk strategy.

Within Oracle's global network and database, portfolio decisions are based on current, standardized information. Redundancy is eliminated and the needs of all organizational units are considered together, with a primary goal of reducing operating costs. In addition, Oracle expects new projects to be in production within six months.

GE Global eXchange Services uses criteria such as payback, cost/benefit, risk, and savings to operations. Because of the dynamics of its industry, the changing nature of IT and the business environment, GE Global eXchange Services looks favorably on investments with shorter payback periods.

At Lockheed Martin, IT investments must meet the goal of modernizing the IT infrastructure while reducing costs. Key elements of the select decision include payback, risk (and mitigation plan), interoperability, link to shared services and project duration.

At HUD, scoring criteria are used in such major categories as: addresses a material weakness found in GAO or Office of Inspector General audits, mission support, project management capability, feasibility of implementation, enterprise architecture, and support of principals' priorities (HUD senior executive priorities). Each major category has a series of sub-criteria to fully assess how well an initiative meets the criteria.

USDA uses criteria for scoring investments including contributions to mission, risk, ROI, security, and architecture. Criteria vary based on the phase of the investment. Investments under development are scored based on cost, risk, schedule and performance goals, as well as security and architecture. Once an investment is implemented, performance measurement shifts toward ROI and contribution to meeting mission goals. USDA reviews criteria after each investment review cycle and modifies the criteria to ensure they continue to meet business needs.

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Lesson 6. Acquire and utilize portfolio, project management, decision support, and collaborative methodologies and tools.

The formulation of the organization's IT portfolio is a highly complex undertaking. Leading IT portfolio managers utilize a variety of automated tools to help them formulate, manage, and maintain their organizations' IT portfolios.

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There are comprehensive IT investment management tools available, including the Federal Government's own IT Investment Portfolio System (I-TIPS), several other systems developed by Government organizations, and a few commercially available investment management products. These tools vary dramatically in the range of portfolio management and support capabilities they provide.

For a more detailed discussion of the tools that are available and in use across the Federal Government, please refer to the *Smart Practices in Capital Planning Guide*, prepared by the CIO Council Committee on Capital Planning and IT Management with the support of members of the Industry Advisory Council (IAC). (Please note that since the CIO Council's restructuring, the Capital Planning and IT Management Committee has become a community of practice under the Best Practices Committee.)

CASE EXAMPLES: METHODOLOGIES AND TOOLS

MITRE uses the London School of Economics Equity Model for prioritization and selection of investments that align with corporate need. The selection process generates a ranked list of prioritized investments and expectations, which helps drive the process to joint agreement on the value, risks, and costs of the proposed investment portfolio.

AXA uses an Analytical Hierarchical Process (AHP) model called STRAT Frames from United Management Technologies to weight the objectives. Each functional group Executive Vice President uses the weighted objectives to prioritize their projects. These senior managers present their "wish list" of potential projects with the expected impact.

The first filter is the correlation of contribution to achieving objectives. Each Executive Vice President separately describes their projects using specific impact ratings of extreme, strong, moderate, low and none. Their impact assessments also use cost benefit analysis, Net Present Value, payback period, and internal rate of return.

The second consideration or "filter" is the dependence on IT and what the need for spending in this area would be. The third filter is IT cost. And, the fourth and final filter is accomplished by loading each business area's allocation for IT into the model. The model then lists the recommended optimized portfolio.

As part of a pilot program, AXA/Equitable Financial uses the ProSight tool to display summary level assessments of project health across three dimensions: risk, value, and investment size. Data is provided by the project owner, made available to Executive Vice Presidents and staff, and is tracked throughout the year. Future enhancements will include using data extractors to obtain data from existing systems.

EDS uses Metis software to create its enterprise architecture-modeling environment. The model visually presents the strategic alignment of IT assets, which can be queried down to an operational level. It is used at EDS for strategic alignment and funding, delivery operations, enterprise process models and application portfolios.

HUD uses I-TIPS, the Enterprise Architecture Management System (EAMS), and Expert Choice to help formulate, manage, and maintain its IT portfolio.

Going into the annual IT portfolio selection process, HUD senior management uses the Expert Choice decision support tool to set portfolio selection priorities. Following the development of priorities and selection criteria weighting factors, HUD’s CIO developed an initiative scoring methodology that translated strategic priorities and weights into IT project ratings and rankings. These rankings reflect the mission priorities and weights set by the Department’s senior executives. The Expert Choice tool is then used again to optimize a portfolio that mirrors the strategic priorities and Congressional appropriation. By using the Expert Choice methodology in its IT portfolio management process, HUD is able to quickly adjust to external drivers and oversight decisions.

Some organizations are using Applied Information Economics techniques, and others are employing the Balanced Scorecard Method. These approaches provide their users with a highly structured, systematic, consistent, and repeatable method to help them better understand the value and risks associated with competing and complimentary IT investment opportunities. Automated portfolio management tools, such as ProSight and I-TIPS are able to support and present information resulting from these approaches.

Lesson 7. Routinely collect and analyze data and information to assess portfolio performance and make adjustments, as necessary.

The top IT portfolio managers interviewed for this report widely agreed on the need to continuously monitor portfolio performance and to establish the organization and management capacity to propose, analyze, and make modifications and adjustments to the portfolio in a timely manner. They also noted that good portfolio management requires careful attention to an organization's strategic, tactical and operational functions.

At the strategic level, the IT portfolio manager must ensure that the mix of investments and associated funding levels are consistent with the organization's mission; program; business goals, objectives, and priorities; as well as the many institutional drivers that govern and direct Agency actions, such as statutory, legislative, and regulatory requirements.

According to Mark Forman of OMB, "Agencies should seek to better understand the impact of legislative drivers. The natural tendency and primary focus of those in Congress is to serve the needs of their constituents. Members of Congress want programs that deliver results."

Dave McClure of GAO believes that, "Executives need to know where money is being spent, what it is being spent on, and what the value is to the Agency. For executives, basic information is the key. Although it's the responsibility of the CIO to communicate across the Agency, executives need to understand they have the responsibility to approve/own major IT initiatives that affect their business area. Executive ownership, participation, and accountability are often missing."

At the tactical and operational level, the IT portfolio manager is concerned that the projects and initiatives that comprise the portfolio are performing, either alone or in some combination, in a satisfactory manner. Portfolio management is combined with IT capital planning and investment control to enable managers to make adjustments to the portfolio's size, scope, schedule composition, and pace of funding.

Several leading Federal organizations and a number of private companies that contributed to this report noted that they periodically conduct assessments of the overall IT portfolio as well as each individual project. Such assessments are conducted on a

quarterly or semi-annual basis, or as dictated by changing business conditions and constraints.

According to Gopal Kapur, President of the Center for Project Management, organizations should focus their IT portfolio assessments and control meetings on critical project vital signs. Examples of these vital signs include the sponsor's commitment and time, status of the critical path, milestone hit rate, deliverables hit rate, actual cost versus estimated cost, actual resources versus planned resources, and high probability, high impact events. Using a red, yellow, or green report card approach, as well as defined metrics, an organization can establish a consistent method for determining if projects are having an adverse impact on the IT portfolio, are failing and need to be shut down.

Specific criteria and data to be collected and analyzed may include the following:

- Standard financial measures, such as return on investment, cost benefit analysis, earned value (focusing on actuals versus plan, where available), increased profitability, cost avoidance, or payback. Every organization participating in the interviews includes one or more of these financial measures.
- Strategic alignment (defined as mission support), also included by almost all organizations.
- Client (customer) impact, as defined in performance measures.
- Technology impact (as measured by contribution to, or impact on, some form of defined technology architecture).
- Initial project and (in some cases) operations and schedules, as noted by almost all organizations.
- Risks, risk avoidance (and sometime risk mitigation specifics), as noted by almost all participants.
- Basic project management techniques and measures.

And, finally, data sources and data collection mechanisms also are important. Many organizations interviewed prefer to extract information from existing systems; sources include accounting, financial, and project management systems.

CASE EXAMPLES: DATA GATHERING

HUD conducts quarterly IT “control reviews” to ensure that its portfolio and projects continue to meet requirements, support mission and business goals and objectives, and are progressing in accordance with planned cost, schedule, and technical baselines. The control review is used to determine whether any modification or adjustment to the portfolio is necessary.

For example, during one of its control reviews, HUD’s portfolio managers discovered the organization was spending much more on new systems and much less on infrastructure than best practice organizations. This finding was supported by the increasing difficulty the infrastructure was having supporting its system load. The HUD CIO then mapped a three-year path to a best practices portfolio profile: specific percentages of the IT budget were set for each category for each of the following three years.

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In addition, HUD has integrated its accounting system data with its investment portfolio data to improve the quality of portfolio management. From a control standpoint, project managers at HUD receive a monthly accounting report showing obligated, committed, and expended funds as well as unbilled costs. Schedule is tracked on major milestones and deliverables. Earned value is used to gauge project performance at quarterly control reviews.

At AXA/Equitable updates on the status of individual projects are collected from individual project managers rather than from independent or automated sources. Both approaches have their proponents, but other factors to consider in this area are the level of effort, opportunity cost to collect the data, timeliness, availability, refresh frequency, and objectivity.

Some organizations gather portfolio management data purely from internal sources, while others look outside, collecting information and feedback from customers, employees, or other external sources. Externally collected measures, where used, are often tied to performance metrics programs. To date, much more progress appears to have been made in defining evaluation criteria and performance measurement data than in building and integrating the collection systems to furnish it.

The CIO at EDS believes that “facts and data set you free.” To ensure the portfolio maintains its expected value throughout its life, continuous data collection and performance monitoring is necessary. The metrics are collected and displayed in the "Service Excellence Dashboard," which displays the rates and ranks of services.

Customers rate services, too. There is a common understanding of where the data comes from, so there is no debate about that.

CASE EXAMPLES: ANALYZE DATA

At EDS, investment decisions are made in a factored way with decision making supported by tools such as Metis. Metis software is used to create an enterprise architecture modeling environment. It visually depicts the strategic alignment of IT assets and allows for the debate of weights and value critical to portfolio management.

The use of ProSight at AXA/Equitable allows management to display summary level assessments of project health across three dimensions: risk, value, and investment size. Data is provided to Executive Vice Presidents and staff, and is tracked throughout the year. Future enhancements will include using data extractors to obtain data from existing systems.

Many Federal agencies use I-TIPS as the information repository for IT initiatives. A key advantage in using a tool (with data that is continually updated) is continuous management visibility into current performance results of each investment as well as the portfolio.

The CIO at Customs stated that using this “project health” knowledge helps Customs prioritize projects and determine whether certain projects should be accelerated, modified or terminated.

A key to effective portfolio management at GE Global eXchange Services is a central repository of all IT projects and systems. The objective in each of these cases is to quickly access and see if there are any redundancies or overlapping projects. The CIO must have a centralized repository to gain a strong understanding of the corporate portfolio and be open to leveraging resources and ideas across business functions.

Other examples of enterprises in the public sector embracing this activity include BLM where specific factors, including the contribution the investment is expected to make to the Agency’s mission and strategic plan, is required in each business case. It is then used in ranking and rating criteria to evaluate investment.

Likewise, DOL captures and documents Strategic Alignment in I-TIPS and uses this data as part of their investment ranking criteria.

At Oracle, a guiding principle has been to shed capital assets to reduce costs and gain competitive advantage particularly as it applies to the IT portfolio. They achieve this by consolidating, simplifying, standardizing and centralizing. They offer incentives to unit managers to move them to use centralized, logically single point solutions and by providing financial disincentives to using alternatives.

Lesson 8. Carefully consider the internal and external customers and stakeholders of the organization's IT portfolio.

During a recent interview for this report, Norm Lorentz, OMB's Chief Technology Officer stated that, "agencies should not underestimate the need to understand [their] customers and constituents. What is demanded by [their] customers must be kept in mind. Frequently, Government agencies spend more time doing business with itself, when it needs to be more citizen-centered."

"Agencies should not underestimate the need to understand [their] customers and constituents."

With regard to the members of Congress, Dave McClure of GAO contends that, "the Hill tends to view [portfolio management] from an 'approval of spending motive.' Appropriators, like all budgeting officials, must carefully balance competing priorities and demands within a given funding limit. Thus, compromise and adjustments are made through this process. GAO and agencies need to discuss with their appropriations staff the tradeoffs that need to be made."

Agencies can invoke good decision making processes by maintaining their focus on justifying the value of their IT portfolio by major initiatives. This can be accomplished by communicating mission impact in terms of reliable outcome metrics.

The role of the business program cannot be ignored. After all, many of the portfolio components exist to support their operations, and in turn support the mission of the organization.

Well-managed organizations effectively involve the business programs, encouraging them to "own" the portfolio management decisions and account for investment performance. In fact, OMB stresses that business managers actually own the portfolio. Norm Lorentz states that, "the business manager owns the outcomes and must review progress. They should participate with other business owners to identify cross-functional opportunities to leverage efforts across the enterprise and portfolio. They should also share lessons learned."

CHANGING VIEWPOINTS WITH THE USE OF TOOLS

Yet, bringing business program staff in and having them assume a more corporate view is difficult. According to GAO's Dave McClure, it is difficult to take the business unit hat off and put the corporate hat on.

Even private businesses have a hard time taking the corporate view instead of their own business unit view. This is a cultural issue that people have to go through. To improve business program participation, Dave McClure advises a combination of informal and formal processes. Participants “need to have more dialogue to understand each other’s business needs. The CIO can be a broker on the totality of needs and opportunity and pain scale."

Another approach is to ask business program personnel to utilize evaluation tools – scoring techniques, analytical tools, ranking, and other clear criteria. They need to understand how these criteria are used across the organization to measure IT needs.

IDENTIFY STAKEHOLDERS

Expanding business involvement in portfolio management often includes the following:

- Recognizing that the business programs are critical stakeholders, and improving that relationship throughout the life cycle;
- Establishing service level agreements that are tied to accountability (rewards and punishments)
- Shifting the responsibilities to the business programs and involving them on key decision making groups.

In many organizations, mechanisms are in place to enable the creation, participation and “buy-in” of stakeholder coalitions. These mechanisms are essential to ensure that the decision making process is more inclusive and representative. By getting stakeholder buy-in early in the portfolio management process, it is easier to ensure consistent practices and acceptance of decisions across an organization. Stakeholder participation and buy-in can also provide sustainability to portfolio management processes when there are changes in leadership.

Stakeholder coalitions have been built in many different ways depending on the organization, the process and the issue at hand. By including representatives from each major organizational component who are responsible for prioritizing the many competing initiatives being proposed across the organization, all perspectives are included. The approach, combined with the objectivity brought to the process by using pre-defined criteria and a decision support system, ensures that everyone has a stake in the process and the process is fair.

Similarly, the membership of the top decision making body is comprised of senior executives from across the enterprise. All major projects, or those requiring a funding source, must be voted upon and approved by this decision making body. The value of getting stakeholder participation at this senior level is that this body works toward

supporting the organization's overall mission and priorities rather than parochial interests.

CASE EXAMPLES: A GOOD MIX OF STAKEHOLDERS ENHANCES PM SUCCESS RATE

From our interviews, we noted that stakeholders should at least include a financial, a technical and an operations executive.

At USDA, key stakeholders in the portfolio management arena include both political appointees and career executives.

At DOL, for example, the CIO's Office created key partnerships with the Office of Budget, the CFO, the Procurement Office, Office of the Secretary, and other internal decision makers in advance of their IT Capital Planning and Investment Control process. DOL enhanced these partnerships with "CIO outreach support" to assist agencies with all facets of the new processes in their own environment.

HUD also used this outreach approach to support business units in their business case preparation. According to the Deputy CIO for IT Reform, "We worked with them rather than hammering them." HUD also helped business executives understand how portfolio management serves them by helping them solve problems, and in so doing, they became advocates.

In some cases, support from the business units in decentralized organizations provided the high-level support across the board support.

At AXA/Equitable Financial, for example, while the CEO was the driving force, the Governance Committee included the functional Executive Vice Presidents and relied heavily on their strategies for their own business units. In general, a consensus of stakeholders at this level would know where there is a real need for a change. They are able to lay the groundwork for constructive collaboration, ensure communication and have easy access to all levels of the organization. It is at this executive second level that the change process really gains the needed support and momentum to make the change successful.

At EDS, IT investment decisions are now based on inputs from the process owners in the business units. The process and culture have advanced enough that there can be real discussions of value. In the past, decisions were sometimes re-opened. Failing projects were allowed to re-surge after program decisions had already been made. In fact, it was common practice for the debate to begin after the decision had been made. This is no longer the case. When the discussion period ends and a decision is made, the focus is now on moving forward.

At USDA, key stakeholders in the portfolio management arena include both political appointees and career executives. This mix of players provides understanding and responsiveness to administrative priorities and legislative requirements, while ensuring that portfolio management processes continue during changes in leadership. Involvement and support from career executives has provided a measure of sustainability that would not otherwise be possible.

Lesson 9. Pay very close attention to the inter-organizational aspects of the organization's IT portfolio.

Indeed, Lesson 9 speaks to the heart of the Government-wide effort to maintain a more customer-centric focus. Accomplishing this will help to "unify and simplify" Government functions, processes, and activities, including the IT resources that support them.

The National imperative to ensure homeland security has helped to garner attention to the Federal IT portfolio from many populations.

In addition, the National imperative to ensure homeland security has helped to garner attention to the Federal IT portfolio from many populations. The general public, the Administration, Congress, Government agencies, as well as private organizations realize they must work together to better coordinate their activities and share information for the public good.

Three very important Government wide initiatives, the Homeland Security Program, the ongoing Quicksilver effort, and the Office of Management and Budget's work to establish a Federal Enterprise Architecture very clearly demonstrate the shift away from narrowly focused and Agency-specific efforts and activities.

Instead, we are in the midst of a transformational shift toward a heightened and, very hopefully, a sustained focus on the mission, functions, programs, and people that Government supports and serves across all Federal agencies. In addition, greater coordination and integration between Federal, state, local, and foreign governments as well as the public and private industry has gained importance.

In the terms of e-Government, these interfaces have been popularly described as the Government-to-Citizen (G2C), Government-to-Government (G2G), Government-to-Business (G2B), and Internal Efficiency and Effectiveness (IEE) interactions, exchanges, and transactions.

With clear direction and helpful guidance from their oversight and review organizations (such as OMB, GAO, the Federal CIO Council, etc.), the leading Federal IT portfolio management organizations are rapidly expanding their view of the work they do in relation to the work of others. This allows them to more carefully consider the broader impacts of the investments they are making in information technology.

The new and highest level goals for IT portfolio management are being shaped and defined in Government-wide terms. Consequently, they are goals that each and every Federal organization will need to adopt. These goals, which are to be pursued and achieved on a Government-wide basis, include the following:

- Ensure that there is a business case for all investments in IT;
- Clearly identify and understand the benefits and impacts of IT projects;
- Eliminate unnecessary redundancy in IT projects and initiatives;
- Consolidate IT activities wherever it makes sense to do so; and
- Promote the sharing of information and supporting IT resources to support mission and business operations across organizational lines.

CASE EXAMPLES: CROSS AGENCY COLLABORATION

Agencies involved in major transformation efforts are keenly aware of the inter-organizational aspects of their IT portfolios.

Perhaps the most significant example of this lesson in practice is the OMB Quicksilver effort. Quicksilver centers on the formulation and execution of a portfolio of 24 projects to address and provide support and solutions to many of the Government's common mission and business functions. The inter-organizational nature of this effort is reflected in the composition of each Quicksilver project team, which includes representatives from many Federal organizations.

In the aftermath of the tragic and horrific terrorist events of September 11th, the Administration, Congress, and Federal Agencies are identifying cross-organizational mission and business areas that support Homeland Security, including border protection and first response. The organizations with responsibilities in these areas have been directed to work together to develop an integrated approach that will ensure adequate and appropriate levels of information and resource sharing. It is likely these efforts will rely on the formulation and implementation of a common architecture and associated portfolio of projects and initiatives.

The OMB Quicksilver initiative also can serve as a model for Federal organizations with IT projects that do not have interfaces, exchanges, or transactions with other entities. Instead, the organization will look within itself and across its mission and business areas to identify areas for collaboration and shared investments. The USDA is contemplating this approach.

The Department of the Interior, Customs, the Internal Revenue Service, and other organizations involved in major transformation efforts are keenly aware of the inter-organizational aspects of their IT portfolios. These organizations are working with their customers and stakeholders to establish IT portfolios. These portfolios will fully support their business activities across organizational lines and provide for the integration of IT systems and services necessary to support their interfaces, exchanges, and transactions.

And, OMB's recent and ongoing effort to establish a Federal Enterprise Architecture will, among other things, provide a common business model that Agencies will be able to use to identify additional opportunities to engage in inter-organizational efforts. These efforts will transform Government operations and help to achieve significant gains in effectiveness and efficiency.

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Conclusions and Recommended Next-Steps

In performing the interviews and preparing the results for our previous CIO Council/IAC document, *Smart Practices in Capital Planning*, we noted that many private and public organizations had developed relatively sound IT investment management practices. To a large extent, these practices focused on the selection of viable and valuable IT projects and initiatives.

CONCLUSIONS

In addition to the lessons presented in this report, there also are several general conclusions or observations that were drawn from the many interviews that were conducted:

- The selection of sound IT investments is a requirement. However, effective portfolio management also requires extensive and ongoing management and maintenance.
- The move from investment management to portfolio management occurs on a continuum. Organizations generally develop and focus on ways to manage investments first, then begin to look at the bigger picture of how a collection of investments contributes towards the achievement of business objectives.
- Good portfolio management practices develop over time. None of the organizations that provided input to this report have implemented what can be called a complete portfolio management program. Instead, they have identified, developed, and implemented key and core components – many of which have been described throughout this report.
- Assistance is readily available. Both OMB and GAO are helping Federal organizations make the transition from the management of individual investments to the management of their entire portfolio. Several leading organizations have looked to consultants for assistance, and have also done a good job in sharing lessons learned and best practices with their colleagues at other Agencies.
- Within the private sector, many firms are adopting and adapting portfolio management practices on their own and with the assistance of consultants.
- A variety of tools exist to help an organization develop and further mature its portfolio management processes. Inventory tools, architecture repositories, and decision support software can assist in tradeoff analysis. These types of tools have been widely cited as key enablers and critical success factors for effective portfolio management.

RECOMMENDED NEXT-STEPS

This report provides at a summary level the lessons learned and insights gained from interviews with representatives of several Government and private organizations.

During the interviews, much important and useful information was collected around each of the lessons learned. Over the next several months, the Best Practices Committee plans to prepare a series of more in-depth “Portfolio Management Practice Papers.” Some of the topics to be addressed will include:

- Methodologies and tools to formulate, manage, and maintain IT portfolios.
- Management of portfolio risk.
- Organizational roles and responsibilities for effective portfolio management.
- Portfolio management within a federated organization.
- Use of sub-portfolios to improve investment control.
- Integration of portfolio management capital planning and investment control, budget formulation and execution and procurement and acquisition processes.

Acronyms

BLM	Bureau of Land Management
CCA	Clinger-Cohen Act
CEO	Chief Executive Officer
CFO	Chief Financial Officer
CIO	Chief Information Officer
CPIC	Capital Planning and Investment Control
Customs	U.S. Customs Service
DLA	Defense Logistics Agency
DOL	U.S. Department of Labor
EDS	Electronic Data Systems
GAO	General Accounting Office
GEGXS	GE Global eXchange Services
HUD	U.S. Department of Housing and Urban Development
IAC	Industry Advisory Council
IT	Information Technology
ITIB	Information Technology Investment Board
ITIM	IT Investment Management
I-TIPS	Information Technology Portfolio Management System
OMB	Office of Management and Budget
OPM	Office of Personnel Management
ROI	Return on Investment
SCO	System Coordination Office
USDA	U.S. Department of Agriculture

References

DOCUMENTS

Budget of the United States, Office of Management and Budget, February 2002

Capital Programming Guide, Office of Management and Budget, July 1997

Circular No. A-11, Preparing and Submitting Budget Estimates, Office of Management and Budget, July 2001

Circular A-94, Discount Rates to be Used in Evaluating Time-Distributed Costs and Benefits, Office of Management and Budget, 1992

Circular A-127, Financial Management Systems, Office of Management and Budget, 1993

Circular A-130, Management of Federal Information Resources, Office of Management and Budget

Federal CIO Council, ROI and the Value Puzzle, January 1999

Federal CIO Council, Federal Enterprise Architecture, Version 1.1, September 1999

Federal CIO Council, Smart Practices in Capital Planning, October 2000

General Accounting Office, Information Technology Investment Management: A Framework for Assessing and Improving Process Maturity (Exposure Draft). AIMD-10.1.23. www.gao.gov/special.pubs/ai10123.pdf

Information Technology Resources Board, Assessing the Risks of Commercial Off-the-Shelf Applications, December 1999

FEDERAL WEB SITES

United States Bureau of Land Management at http://www.blm.gov/

United States Customs Service at http://www.customs.treas.gov/

United States Defense Logistics Agency at http://www.dla.mil/

United States Department of Agriculture at http://www.usda.gov/

United States Department of Housing and Urban Development at http://www.hud.gov/

United States Department of Labor at http://www.dol.gov/

United States Office of Personnel Management at http://www.opm.gov

Executive Office of the President, Office of Management and Budget at http://www.whitehouse.gov/omb/

General Accounting Office at http://www.gao.gov

Federal CIO Council at http://www.cio.gov/

Federal CFO Council at http://www.cfo.gov/

Federal Procurement Executive Council at http://www.pec.gov/

I-TIPS at http://www.itips.gov

Budget of the United States, Office of Management and Budget, February 2002

http://www.whitehouse.gov/omb/budget/fy2003/index.html

Capital Programming Guide, Office of Management and Budget, July 1997

http://www.whitehouse.gov/omb/circulars/a11/cpgtoc.html

Circular No. A-11, Preparing and Submitting Budget Estimates, Office of Management and Budget, July 2001

http://www.whitehouse.gov/omb/circulars/a11/01toc.html

Circular A-94, Discount Rates to be Used in Evaluating Time-Distributed Costs and Benefits, Office of Management and Budget, 1992

http://www.whitehouse.gov/omb/circulars/a094/a094.html

Circular A-127, Financial Management Systems, Office of Management and Budget, 1993

http://www.whitehouse.gov/omb/circulars/a127/a127.html

Circular A-130, Management of Federal Information Resources, Office of Management and Budget

http://www.whitehouse.gov/omb/circulars/a130/a130trans4.html

Federal CIO Council, ROI and the Value Puzzle, January 1999

Federal CIO Council, Federal Enterprise Architecture, Version 1.1, September 1999

http://www.cio.gov/Documents/fedarch1%2Epdf

Federal CIO Council, Smart Practices in Capital Planning, October 2000

http://www.cio.gov/Documents/smart%5Fpractices%5Fbook%2Epdf

General Accounting Office, Information Technology Investment Management: A Framework for Assessing and Improving Process Maturity (Exposure Draft). AIMD-10.1.23. www.gao.gov/special.pubs/ai10123.pdf

Information Technology Resources Board, Assessing the Risks of Commercial Off-the-Shelf Applications, December 1999

http://www.itrb.gov/documents/cotsfinal%2Edoc

PRIVATE WEB SITES

AXA/Equitable at http://www.axa.com/

Electronic Data Systems at http://www.eds.com/

GE Global eXchange Services at http://www.gegxs.com/

Ingram Micro, Inc. at http://www.ingrammicro.com/corp/

Lockheed Martin Corporation at http://www.lockheedmartin.com

The MITRE Corporation at http://www.mitre.org/

Oracle Corporation at http://www.oracle.com/

SRA International, Inc. at http://www.sra.com/

STRATFrames at: http://www.umt.com

Verizon at http://www.verizon.com/

Equity Model at http://www.enterprise-lse.co.uk/equity.htm

Metis at http://www.metistech.com

Expert Choice at http://www.expertchoice.com

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