

SPECIAL ENTERPRISE
INFORMATION
TECHNOLOGY ISSUE

**Automatic
Identification:
When to Use RFID**

**Effective
Implementation
Management Needs
an IT Entrepreneur**

**Emerging Standard
Addresses eCommerce
Message Security**
Commerce Portals Use
ebXML to Enhance
Reliability

**Performance-
Based Contracting:
Here to Stay, But
Challenges Ahead**

**The Business
Value of CMMI**

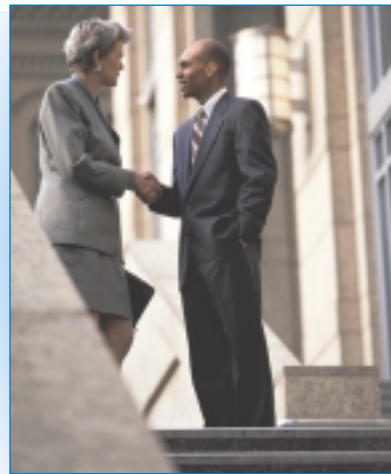
**The Tangible Value of
Enterprise Architecture**

**Why Conduct
User-Centered Design for
Software Development?**

Calendar of Events

Performance-Based Contracting: Here to Stay, But Challenges Ahead

Who among us has not heard the new buzzword in the U.S. federal business sector called “Performance-Based Contracting?” But what is it? What is the big deal? Is it yet another flavor-of-the-month, contracting/program management style touted as a new and improved way of conducting federal business, which



Meeting the promise of performance-based contracts requires partnering and collaboration between agencies and contractors.

is usually only the old way with a different wrapper? What does this mean to me—contracting issues impact only contracting professionals, right?

Actually, Performance-Based Contracts (PBCs) have been around for more than 20 years and have long been identified as an effective way to acquire quality goods and services within available budgetary resources. In fact, the federal government has been promoting them as a way to achieve savings and obtain greater value while also pushing federal agencies to outsource more work to the private sector. Hence, PBCs have never before had such profound potential to significantly affect the world of federal procurement.

continued on page 6

The Business Value of CMMI

The rigor with which an organization conducts planning, engineering, and managing activities within an IT development or maintenance project can seriously impact cost, quality, and completion times.

The Capability Maturity Model Integration (CMMI®) rating is being adopted worldwide by government, military, and commercial organizations as the standard for assessing an organi-

zation’s ability to perform. In fact, many government agencies now recognize the value of a CMMI maturity rating and require that designation to bid successfully on contracts.

The CMMI framework describes an evolutionary improvement path from an ad hoc, immature process to a mature, disciplined process. These processes provide the building blocks that establish the infrastructure and

continued on page 4



The Tangible Value of Enterprise Architecture

Since the Clinger-Cohen Act of 1996, (which mandates federal agencies' approaches to IT acquisition and management), U.S. federal agencies have been working diligently to

develop enterprise architectures (EA) to serve as a foundation for information technology (IT) planning and implementation. A complex and challenging innovation, EA takes years to learn about and implement successfully. By finding and demonstrating tangible value as early in the implementation process as possible, enterprise architects increase their chances of making EA an effective component of their agency's IT governance processes.

Where are the opportunities for demonstrating this kind of tangible value? ICF Consulting has seen agencies demonstrate the value of EA in at least three ways: through the implementation of an EA program; through the role of EA as a learning tool during organizational transition; and through the use of EA as a foundation for security analysis and planning.

Implementation of an EA program emphasizes the change management aspects of managing IT planning, acquisition, and management more rigorously. Rather than focusing on the tools, models, products, and other technical aspects of EA development, focus on creating the organizational decision-making processes that will use EA information to make better IT decisions. Such a focus means establishing the required information flows and business processes, organizational policies, and decision-making groups, such as an Enterprise Architecture Working Group and a Technology Acquisition Board. Roles and responsibilities of these groups are defined with an eye toward the effective use of EA information. Members receive required training in interpreting and using the information they will need to make good decisions. New organizational policies help support the new behaviors while discouraging the persistence of old behaviors.

An important aspect of this approach to demonstrating EA value is that the organization can begin to function in the new way without having completed the technical implementation of the EA itself. Instead of waiting for all relevant EA products to be populated in the EA reposi-

tory, this approach uses the tacit architecture that already exists in every organization. Getting the right people in the room has the same effect as getting the right knowledge into the tool—it makes the EA tangible and available for decision-making. The more an agency sees the value of making disciplined IT decisions, the more credibility the explicit EA will have when it is finally completed and fully documented.

A second valuable use of EA seen in agencies is the role of EA products as learning tools during a time of organizational transition. For example, ICF Consulting helped a new Chief Information Officer (CIO) use EA products to come up to speed as quickly as possible on the salient aspects of the information infrastructure. The technical reference model provided a useful introduction to the technology suite in use at the agency, the systems inventory let the CIO know which systems were central to agency

ICF Consulting has seen agencies demonstrate the value of EA in three ways: through implementation of programs to improve decision-making; through the role of EA as a learning tool during organizational transitions; and through the use of EA as a foundation for security analysis and planning.

business, and the systems infrastructure diagrams allowed the CIO to see the major system components, including internal and external interfaces maintained by the agency.

Another form of transition relates to business process change. Agency program managers have used the business process models stored in the EA's business architecture as the basis for

analysis of their day-to-day operations. Sensing the existence of bottlenecks and other process inefficiencies, these managers used the EA's business process models as a basis for process analysis and improvement activities. The models provided a path for identifying and removing process bottlenecks and inefficient and redundant processes, and aided in identifying areas where additional IT investment might lead to significant process efficiency gains. Of course, resulting business process changes were then entered back into the EA to keep it current.

The third area of demonstrated value for the EA is in security management. EA models such as the node-connectivity diagram and the systems interface descriptions document the places at which the agency's systems

continued on page 5

Why Conduct User-Centered Design for Software Development?

User-centered design is the current term for a very old concept—that of developing tools that better meet the needs of the user. The results of user-centered design are everywhere in our lives—from drive-up ATMs that are at the proper height, to well-placed cupholders in your car, to Web sites that make complex features intuitive. A well-designed product enhances the customer experience and, as in the case of software development, can lead to lower costs for the organization.

User-centered design leverages a number of tools and techniques at various points during the development life cycle. Accurately defining requirements remains an essential first step in the process. Because of the high costs and number of individuals involved in software development, a solid requirements document provides a blueprint in much the same way an architect would detail the plans for a large building. Just as the architect would consider a range of aspects, such as the intended use and materials, the analysts who draft software requirements need to consider a range of items from functionality to security. Though requirements definition takes time and resources initially, it is proven to reduce costs later in the life cycle. Study after study has demonstrated that better requirements mean lower costs and reduced risk. Requirements errors cost from 28 to 42.5 percent of the total software development costs of a project.¹

User-centered design begins with requirements and continues throughout the development life cycle. During prototyping and development, applying a series of tools and techniques iteratively will help test concepts and identify additional opportunities for improvement.

Following principles of user-centered design and integrating the tools and techniques into your project can result in the important goal of achieving a Return on

Investment (ROI). ICF Consulting's experience demonstrates several findings that have resulted in savings:

- Identifying unneeded functionality in a proposed project can reduce development costs
- Creating sites in which the functionality most users need is present and apparent (or on-line help for uncommon tasks is present and apparent) can decrease call center volumes
- Removing unused features or content can reduce storage, server, information services, or maintenance costs

| Techniques & Tools | Description |
|--------------------------------------|---|
| Card Sorting | Tests the information architecture of the site and ensures that users are able to locate desired information |
| Customer Segmentation | Provides a mechanism to divide users into distinct groups who have similar characteristics or who use a site in similar ways |
| External Market Research | Presents an opportunity to secure external market research to better understand the user |
| Focus Group | Provides an opportunity to test software/software components with a representative group of users |
| Interviews | Provides an opportunity to question stakeholders to build upon their knowledge and experience with users or with existing systems |
| Prototypes | Provides an opportunity to test an example of the software/software component with the user |
| Satisfaction Surveys/ Questionnaires | Provides an opportunity to sample user's satisfaction after the software has been launched |
| Scenarios for Use | Provides a method to test users based upon asking them to complete a series of key situations |
| Usability Goals | Develops a series of metrics to baseline and track improvements to the site |
| User Personas | Develops a group of hypothetical users who represent the types of individuals who will be using the system |

Often there is a tendency to assume you know the user. Though this preliminary knowledge will help you design effective ways to test usability, user consultation is still essential.

As you plan your next project, consider what you know about your customer and how you can test that knowledge throughout the development life cycle. Whether in the public or private sector, user-centered design provides a means to achieve two universal organizational goals: improving the customer experience, and lowering the service cost.

For more information on ICF Consulting's capabilities in user-centered design, please visit www.icfconsulting.com/enterprise-solutions.

¹ Wiegers (2003) and I. Hooks & K. Farry (2001).

The Business Value of CMMI (cont. from page 1)

discipline needed to move to the higher levels of maturity that lead to improvement in project performance. The five maturity levels in the CMMI model build on the process areas from preceding levels. The Software Engineering Institute (SEI), a federally funded research and development center sponsored by the U.S. Department of Defense (DOD) and operated by Carnegie Mellon University as the governing body for CMMI, sets the standard and certifies appraisers. The SEI originally developed the Capability Maturity Model (CMM) under DOD sponsorship 15 years ago as a method of evaluating a software vendor's capabilities.

Many benefits are derived from the rigorous ratings process. An organization achieving a maturity rating can prove its ability to perform at a strong and consistent level in that area.

Additional strengths of CMMI include the ability to incorporate business goals within process improvement, such as increasing schedule and budget predictability, productivity, quality, customer satisfaction, employee morale, and Return on Investment (ROI). Furthermore, sharing knowledge across the company helps to ensure that the strengths of an organization are applied to each engagement, rather than being people- or project-centric.

While the original CMM suite focused on software processes, CMMI covers software development plus other related fields, such as Systems Engineering, Product Acquisition, Integrated Teaming, and Requirements Development. Thus CMMI builds on and extends the principles of CMM into new areas, while updating best practices in all areas. The SEI no longer provides enhancements to CMM and is in the process of "sunsetting" CMM and encouraging firms to migrate to the more-robust CMMI suite. As a result, the "market value" of a CMM rating will decrease over time as organizations earn the CMMI rating.

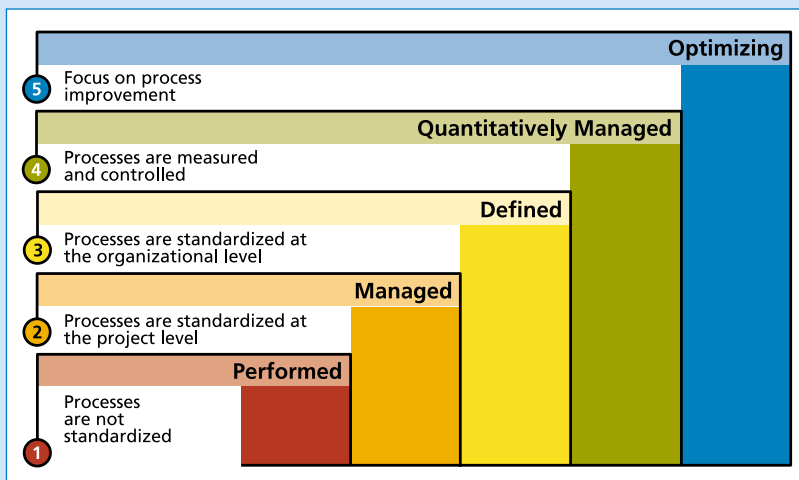
Both the CMM and CMMI models have come under criticism by some observers and practitioners who have seen organizations implement the model solely to achieve a maturity rating. Critics have cited examples of organizations "slipping back" to their previous methods of doing business after achieving their rating.

Organizations behaving in this manner may achieve their goal of securing the maturity rating that allows them to bid on federal government contracts, but they sell themselves short by not taking full advantage of the infrastructure and knowledge that their efforts have achieved. To truly improve business practices, a change in the organization's culture is required to be able to objectively examine new data and honestly and open-mindedly decide whether to change processes.

To know whether an organization is truly implementing the CMMI, ask to see its Process Improvement Plan. Firms committed to improving their business processes are continuously planning to achieve higher levels of maturity and capability. This will be reflected in their plan and in their process improvement schedule. Also, ask about the improvements already achieved and how their processes have changed over time to enable them to reach their business goals. Organizations implementing CMMI have this information readily available and are enthusiastic about discussing their accomplishments.

For more information about ICF Consulting and the CMMI appraisal, please visit www.icfconsulting.com/CMMI.

Maturity Levels of the CMMI



The CMMI framework describes an evolutionary improvement path from an ad hoc, immature process to a mature, disciplined process. Five maturity levels in the CMMI model incorporate process areas from preceding levels. These processes provide the building blocks that establish the infrastructure and discipline needed to move to the higher levels of maturity that lead to improvement in project performance.

Automatic Identification: When to Use RFID

➔ Visit www.icfconsulting.com to download the full paper.

The automatic identification of products has become commonplace. Bar codes on food, clothing, and other merchandise are scanned at checkout to provide the merchant with information. But the information in bar codes is static and requires manual scanning.

The most important new technology in the automatic identification arena is RFID (Radio Frequency Identification)—and it is receiving widespread publicity. RFID uses a tag consisting of a chip and antenna that responds to a reader using radio waves to access the information. The use of RFID is becoming a mandatory requirement within the U.S. Department of Defense supply chain, and Wal-Mart has prominently planted the RFID flag in the private sector.

RFID offers many attributes that make it advantageous over bar codes—increased data capacity, wide-range readability, and the ability to change data for real-time information. However, with all these positive attributes, RFID tags are still in the early adoption phase. The tags are



more expensive than bar codes (even as production volumes increase) and performance is affected by antenna patterns, environmental interference, and tag orientations.

The appropriate use of automatic identification is vital to the mission of many organizations, including the U.S. Postal Service (USPS).

Using a combination of automatic identification systems, ICF Consulting is assisting the USPS, the world's largest mover of letters and parcels, in implementing unit load tracking.

The objective is to use automatic identification technologies, whether RFID or not, that make the best sense in postal operations within a considerable technological infrastructure.

For more information about comparing automatic identification technologies and ICF Consulting's capabilities, please visit www.icfconsulting.com to download the full paper.

The Tangible Value... (cont. from page 2)

interface internally with other systems and externally with other agencies. These interfaces represent one of the major vulnerabilities for the agency infrastructure. By integrating the EA and the security profile, security analysts can more effectively protect their IT infrastructure.

All three of these uses of IT have demonstrated the tangible value of the EA to the managers of the agencies involved.

Interestingly, the agencies referred to earlier did not need to wait for the EA to be fully implemented before realizing the benefits to be achieved. In each case the development of EA products was conducted with reference to the business processes that would use them. By focusing

on the value of the information stored in the EA, these agencies have been able to gradually build a growing management appreciation for this very complex IT requirement.

Lesson learned: find a business challenge where EA can help, use EA to address it now, and demonstrate real business value as soon as possible.

For more information on ICF Consulting's capabilities in enterprise architecture and change management, please visit www.icfconsulting.com/EA or www.icfconsulting.com/change-management.

Performance-Based Contracting... (cont. from page 1)

The goal of PBCs is to improve the value of contracted services by emphasizing objective, measurable, mission-related requirements from the contractor. Service-oriented efforts are ideal candidates for PBCs, though they can be used for much more. Together the agency and the contractor choose performance measurements to gauge a solution's effectiveness, with rewards for superior performance and penalties for sub-par work. This helps ensure alignment of customer and contractor goals. For those providing federal IT services, performance-based Service Level Agreements (SLAs) are rising in popularity.

Through PBCs, the federal government benefits by receiving better performance, lower cost, reductions of contract time, and administrative burdens, while contractors benefit by having more control over their ability to earn profits based on performance. Added benefits of PBCs are the mutual establishment of standards to measure performance, which later can be used as reliable indicators of past efforts. This is important since agencies are placing higher values on past performance and are looking for those vendors who can demonstrate a successful history of working with PBCs.

PBCs are becoming the preferred federal procurement vehicle. Recently, the President's Management Agenda ignited interest in this area, improving the federal government's performance goals by converting 50 percent of all federal service contracts to PBCs by fiscal year 2005. More than \$100 billion worth of contracts are eligible for conversion.

PBCs also are being boosted by legislation such as the Clinger-Cohen Act (which shapes federal agencies' approaches to IT acquisition), the Government Performance and Results Act (GPRA), and most recently the Service Acquisition Reform Act (SARA), all of which were designed to link expenditures of dollars with agency performance.

These directives are predicted to significantly transform the federal acquisition workforce, its entire business structure, its culture, and the broad arena of commercial item

acquisitions. Under SARA for example, some performance-based efforts will now qualify to be considered "commercial item" acquisitions and in some cases could be exempt from many oversight laws. These factors alone could trigger enormous shifts in how agencies operate.

However, the difficulties of changing large, bureaucratic government organizations are immense. Despite the latest PBC revolution, many agencies are not adhering to the guidance while others remain poorly outfitted to capitalize on performance-based contracting. Most still view it as simply adding performance measurements or incentives to their statement of work and the final contract. This narrow take on PBCs is inadequate and ill-fated.

In a sense, the PBC model is harder for both parties: they must think clearly about what is to be accomplished and how to measure when and how well the work is completed. Meanwhile, the government is no longer giving contractors the details of what to do, shifting the burden of the agency's problems to the contractor. This is a different way of doing business for the government, which has historically tried to specify a solution.

To get the most from PBCs, agencies must give their contractors greater autonomy in how work is to be done in exchange for more accountability for final results.

Eventually, this shift to performance-based contracting is anticipated to result in clearer expectations for performance; better communication between the agency and its vendors; greater accountability for results, flexibility, and innovation; and reduced costs overall. Many agencies are already changing the way they have traditionally done business, drastically affecting the skills needed by their procurement personnel. Likewise, contractor-bid strategies successful in traditional procurements may not be successful and could even be disadvantageous in a performance-based procurement.

Still think PBC is just another fad or that its mounting presence in the federal marketplace will not have any impact on you, your profession, or your organization? Think again. This 'new' way of doing business has taken root in the acquisition decision-making process and is branching out into acquisition programs at all levels.

For more information on ICF Consulting's capabilities in the area of performance-based contracting, please visit www.icfconsulting.com/enterprise-solutions.

Despite the latest PBC revolution, many agencies are not adhering to the guidance while others remain poorly outfitted to capitalize on PBC. Most still view it as simply adding performance measurements or incentives to their statement of work and the final contract. This narrow take on PBC is inadequate and ill-fated.

Effective Implementation Management Needs an IT Entrepreneur

Having technology and using it effectively are two different matters. For instance, when multiple hurricanes hit the United States this year, power companies in the mid-Atlantic states were criticized for failing to communicate effectively with their customers. An audit of one of the utility's performance concluded that, while the utility had the technology to keep customers better informed, the company had not implemented it effectively during the crisis.

Such a breach between acquisition and implementation has been termed an "assimilation gap" by technology management researchers and authors Chris Kemerer and Robert Fichman. When the gap grows too wide between the expectations of the purchaser of the technology and those who are trying to implement it, the technology may end up on a shelf and the whole investment can be lost.

How can managers increase their chances for success with new technologies?

As a start, organizations seeking to take advantage of emerging information technologies should invest in rigorous project management and software methodology training.



As successful IT managers know, traditional project management techniques are not sufficient to address the long period often required for effective IT implementation. In Fichman and Kemerer's study, for instance, only 57 percent of firms attempting to implement relational database technology had achieved what they considered full-scale success after four years.

A complex new technology often requires significant organizational learning, changes to business processes, and new attitudes and behaviors on the part of managers and staff using the technology. This extended period of adaptation to and assimilation of the new technology requires implementation management, a discipline that focuses on the period after the delivery or acquisition of the information system.

Are there any keys or rules of thumb that can help managers successfully negotiate the challenges of this period?

Probably the most important rule of implementation management is to encourage managers to act like entrepreneurs—to exploit opportunity wherever it may exist.

The IT entrepreneur is willing to expend the effort necessary to push the invention or new approach across the assimilation gap and into the fabric of the organization.

The traditional manager, perceives he or she has the responsibility to be the guardian of the existing enterprise's interests. In fulfilling his or her role, the tradi-

tional manager may hesitate to promote adoption of a new technology if doing so would appear to threaten (even in a minor way) the health of a business line or strength of a customer relationship.

The entrepreneurial manager, on the other hand, would act more boldly. The entrepreneur would address the issue with a longer term view—will the proposed new technology eventually be better for the corporation and lead to even stronger customer relationships? If so, the entrepreneur would reason, adoption of the new technology should be aggressively promoted.

Because of this broader perspective, the entrepreneurial manager often better understands the usefulness of an idea beyond the bounds of the immediate problem area. In addition, the entrepreneur is willing to expend the effort necessary to push the invention or new approach across the assimilation gap and into the fabric of the organization. And the entrepreneur is willing to tolerate a somewhat higher level of risk in executing the project's adoption allowing for more creative approaches to in-process problem solving.

Although acting like an entrepreneur takes skills and attitudes that may be somewhat foreign to traditional technical IT project managers, managers who want their projects to succeed beyond the mere completion and delivery of the system must accept the challenge to fill this entrepreneurial role.

For more information on ICF Consulting's capabilities in program management, please visit www.icfconsulting.com/program-management.

Emerging Standard Addresses eCommerce Message Security

Commerce Portals Use ebXML to Enhance Reliability

Implementing secure messaging and facilitating transactions across a distributed system continues to be an integral challenge in creating an eCommerce site. Overcoming security and reliability concerns remains essential to fully leveraging the value that a successful eCommerce site can provide.

The U.S. Department of Defense (DOD) and other organizations sponsoring eCommerce sites are succeeding in meeting a number of these challenges through the use of an emerging standard of Electronic Business using eXtensible Markup Language (ebXML). This specification defines the conversational semantics for messaging between systems to address the security and reliability issues.

For security, ebXML supports digital signatures, allowing for message authentication and ensuring message integrity. In using ebXML to send data to trading partners, the sender is guaranteed that the intended recipient receives the data and that the data cannot be modified en route. Orders can be transmitted over the public Internet at a low cost—open Internet lines are used as opposed to a closed, often expensive, private network. ebXML also specifies the level of reliability of its messages. For example, messages are delivered only once and are not subject to potential electronic errors resulting from power surges or processing glitches. Messages not acknowledged by a trading partner within a pre-determined time can be resent without fear of duplication.

As part of ongoing application development support for the Defense Department's main eCommerce site, DOD EMALL, ICF Consulting identified a number of potential weaknesses, including orders that could be duplicated or lost between systems, as well as a number of potential security vulnerabilities inherent in the open nature of the Internet. Among the key enhancements to the new DOD EMALL structure is the use of ebXML.

Security and reliability between Web services became a key concern for DOD EMALL as transaction volume grew from \$13.7 million in 2002 to \$188 million in 2003. Coupled with the increasing number of transactions, the government system also remains an attractive target for hackers. ebXML helps to protect against hackers by using a digital signature.

DOD EMALL has the ability to adapt as the Department's needs evolve and to present a highly personalized screen to users based on their specific job responsibilities, security clearances, and other variables. Most importantly, it performs these enhanced functions in a secure and reliable environment.

Orders through DOD EMALL, one of the largest online operations to adopt ebXML, are expected to approach \$300 million in 2005, processing transactions for more than 500 vendors and 16.5 million diverse items. Among the wide variety of items that can be ordered (each with a different security level required for approval) are office supplies, computers, custom manufactured parts, generators, software, clothing, chemical suits, and music. The system orchestrates Web services in three different geographic locations that work together as a single application to verify and complete a shopper's order. ebXML provides a secure and reliable environment for the transactions.

DOD EMALL has evolved into much more than the standard "shopping cart" for electronic commerce. It now has the ability to adapt as the needs of the user community evolve, providing custom procurement workflows for each agency based on their existing processes and contractual requirements. Most importantly, it performs these enhanced functions in a secure and reliable environment.

For more information on ICF Consulting's architecture development capabilities, please visit www.icfconsulting.com/ebxml.

About ICF Consulting

ICF Consulting is a leading management, technology, and policy consulting firm. Drawing upon its extensive industry knowledge, credentialed professionals, and innovative analytics, it develops solutions to complex energy, environment, homeland security, community development, and transportation issues. ICF Consulting's approach to these issues is strengthened by its expertise in information technology, organizational improvement, program management, and communications. Since 1969, ICF Consulting's 1,000 employees have served

major corporations, government at all levels, and multinational institutions from key business centers in the Americas, Europe, Asia Pacific, and Africa.

For more information on ICF Consulting's services, please visit our Web site at www.icfconsulting.com.

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