Defense Procurement
and Acquisition Policy

ERP and Contract Writing Systems Lessons Learned Survey Report

July 30, 2008

Executive Summary

This document presents the lessons learned from implementing contract writing systems with Enterprise Resource Planning (ERP) applications as researched by Defense Procurement Acquisition Policy (DPAP). Eight Federal Civilian and DOD agencies were interviewed including National Aeronautics and Space Administration (NASA), U.S. Department of Agriculture (USDA), U.S. Department of Energy (DOE), Defense Logistics Agency (DLA), DHS Coast Guard (USCG or Coast Guard), U.S. Customs and Border Protection (CBP), U.S. Department of the Interior (DOI), and the Defense Intelligence Agency (DIA). Support for the project, including this analysis, was provided by IBM Global Business Services (IBM).

The following analysis of lessons learned was gathered based on agency responses on the following questionnaire topics: Program and Project Management, Software Functionality, Change Management, Testing, Data Migration and Conversion, Technical Issues, and Concluding Remarks. Initial analysis concluded that regardless of the implemented software solutions, the lessons learned were generally the same across all agencies. The agencies implemented varying contract writing systems and ERP solution combinations; however they mostly shared the same objectives.

The following table summarizes the interviewed agencies and the ERP applications and contract writing systems they implemented. Future systems are also identified.

Agency	ERP Application	Contract Writing System	Future Systems
National Aeronautics and Space Administration (NASA)	SAP's R/3	Compusearch's PRISM	N/A
U.S. Department of Agriculture (USDA)	Oracle	Compusearch's PRISM	N/A
U.S. Department of Energy (DOE)	Oracle	Compusearch's PRISM	N/A
Defense Logistics Agency (DLA)	SAP's R/3	Failed SPS Integration, reverted back to Legacy GOTS	SAP's PPS to replace GOTS after SAP R/3 upgrade
DHS – U.S. Coast Guard (USCG)	Finance and Procurement Desktop (FPD) - GOTS for simplified acquisition and field accounting integrated with the Oracle suite for Core Accounting System (CAS).	Compusearch's PRISM	N/A
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U.S. Department of the Interior (DOI)	SAP	Compusearch's PRISM	N/A
Defense Intelligence Agency (DIA)	FMS/FACTS (FACTS invoice and payments), a PeopleSoft Financials-based application.	CACI's ComprizonSuite and PRESS legacy requisitioning system.	N/A

The following table summarizes common experiences and notes several unique instances. Note that many of the ratings are born from a combination of factors, including the contract writing software, the integration with and limitations imposed by the ERP applications, chosen implementation methodologies,

and project resources. Consequently, the ratings should not necessarily be attributed to a single element of the holistic solution.

	NASA	USDA	DOE	DLA	USCG	CBP	DOI	DIA
Contract Writing Solution	PRISM	PRISM	PRISM	GOTS	PRISM	IPRO	PRISM	Comprizon
Comptroller/ Procurement Involvement	Ø	3	3	NMD	NMD	3	3	–
Governance	3	3	3	3	Ø	3	3	–
Change Management	3	3	3	3	Ø	3	Ø	–
Data Migration	– Problems managing unconverted awards and using old funds citations	Ø Little migration Manually performed	Ø Little migration due to resource constraints Manually performed Locally determined	– 5-yrs.of data Major issues with piecemeal approach	NMD	TBD With move from SAP IPRO to SAP PPS	– Data standards issues Conversion issues moving to new funding model in ERP FPDS-NG PIID issues	NMD
CLIN Issues/ Traceability with ERP/FM	–	Ø Sub-CLIN support lacking in the FM system	– ERP imposed data capture limitations	–	–	Ø	NMD	– Significant limitations imposed by the ERP
T&C Templates	3	3	3	NMD	NMD	Ø	–	Ø
ASM-like Shortfall	Ø	Ø	NMD	3	–	–	–	–
Reporting	–	–	– Needs to be addressed early	NMD	Ø	–	Ø	– Major delays deploying reporting solution with the CWS

Key:
3 Strong presence, positive impact/key to success
– Strong presence, negative impact
Ø Present with no reported material impact
NMD Not materially discussed
TBD Has not been determined

The top lessons learned from each survey area are presented in the remainder of this summary.

Software Selection
A main reason for DPAP conducting this report was to uncover efforts undertaken and lessons learned by agencies implementing contract writing solutions within ERP applications (e.g., SAP, Oracle). We

discovered that none of the agencies interviewed have yet implemented contract writing functionality within their ERP applications because the ERPs do not sufficiently support Federal or Defense procurement requirements. Most interviewees that looked at ERP contract writing capabilities provided lengthy lists of reasons why they chose not to implement ERP solutions, most of which revolve around the lack of capabilities to support Federal or Defense procurement and the unique legal, regulatory, and business processes therein. Some agencies cited commercial-oriented capabilities in which they were unwilling to invest funding to enhance to meet their needs. Because ERP application support for contract writing was found to be lacking in most respects at the time of solution selection, agencies chose to implement federally-focused stand alone contract writing COTS or GOTS systems interfaced to their ERP application.

We also learned that two agencies, DLA and CBP, intend to deploy within the next several years new federally-focused contract writing functionality being developed within SAP. ERP application providers have been working to include more robust contract writing capabilities within the past few years, which has required significant design and development efforts by the ERP providers along with significant investment and expertise input from Federal agencies. DLA and CBP have provided SAP with these resources. Both agencies have deployed SAP as their ERP solution with the clear intention of migrating to SAP for contract writing within the next one-to-three years. Other interviewed agencies that have deployed stand alone procurement COTS solutions interfaced with ERP applications have begun exploring the ERPs' future capabilities to either improve their interfaces or for eventual replacement of the stand alone COTS solutions.

Thus the timing of the migration to a new contract writing system played a crucial role in system selection. Agencies that began a deployment between approximately 2001 and 2006 did not have ERP application capability available for selection. Between approximately 2005 and 2009, agencies had/have some ERP functionality to support contract writing, with maturity reaching a sufficient level in the latter years. Starting in 2009-2010, two agencies plan to deploy ERP application contract writing capabilities. Presumably, more agencies will follow suit in coming years as ERP contract writing modules continue to mature and become proven solutions.

Cross-Domain Participation

All interviewed agencies stressed strong program and project management to maintain and execute a quality project, as well as cross-domain participation, as the paramount key lessons learned in the Program and Project Management area. All agencies stressed that cross-domain participation broke down silo walls to allow for requirements sharing and understanding of the overall design. Cross-domain participation meant creating committees and teams with representatives across the enterprise including stakeholder business divisions, process areas, and interfacing applications involved and impacted by the contract writing system implementation. Cross-domain committees were also important at varying levels in the organization. Most agencies set up an executive board with members from all impacting levels. Another form of cross-domain team was set up at the user level for requirements discussions and for mid-level managers to ensure engagement and project momentum. Cross-domain usage remained constant across all agencies in all implementation phases from design to training and support.

Minimal Configuration

Another of the software functionality lesson learned equally noted by all agencies was the desire for the software to meet the majority of their business process requirements. Agencies were resistant to customizing their applications to meet their business needs but were willing to reasonably adapt their business around the provided functionality. Thus, agencies were able to select software solutions that addressed the majority of their business needs. In most cases ERP application solutions were evaluated for contract writing features, but were passed up due to the lack of satisfying basic contract writing business needs for the Federal and Defense communities. Instead, agencies looked for specific contract writing solutions or held off on implementations until ERP solutions provided a more definite contact writing solution. Once solutions were selected, business requirements were fully analyzed and mapped to solution functionality. Minor gaps and issues were address by process improvements or minor work-arounds. Overall the agencies were satisfied that their selected contract writing application met the majority of their business objectives.

Change Management
Focus on holistic change management across the implementation life-cycle was a major lesson learned by all agencies. Although this area has many facets, including stakeholder involvement, communications, training and help desk, all techniques for managing change were deemed crucial. Change Management is one component of software implementation that often gets overlooked or discounted due to lack of funding or underestimated as to the amount of required effort. Most agencies stressed the need for appropriate funding and allocated resources to support all change management functions. The introduction of any new software application will bring business process changes, policy changes, and changes to employees' everyday activities. All of these changes will require managed support through the project life-cycle and beyond software implementation.

Testing
All interviewees stressed the need for extensive testing in conformance with system development life-cycle (SDLC) best practices. Agencies recommend that proper planning and time should be dedicated to the testing efforts. A multi-phased approach should be used to test business processes, system functionality, and interfaces. Proper testing of an application provided agencies with a go/no-go decision opportunity prior to roll-out the system to the user base. Agencies stressed the importance of testing to minimize post-implementation issues, negative impacts to business operations, and poor user adoption.

Data Migration Considerations
Data migration and conversion interviews had varying feedback from the agencies. A key finding in this area was that the agencies all evaluated the state of their legacy applications and their ability to convert that data into new ERP or contract writing systems. In most cases, the legacy data could not be easily converted and the agencies were left with making a decision to migrate data based on the state of the transactions (contract completion, award period, etc). Transaction state was defined differently by each agency based on additional key influential factors such as cost, time, resource requirements to manually migrate, and post-migration data usability in the new systems.

System Stress Testing
Technical issues pointed out by the agencies were minor but the one major technical consideration identified is stress testing. The contract writing applications will be heavily used during peak business periods such as end of fiscal year; therefore, the applications should be stress tested prior to roll out to the user community. Stress testing allows an agency to simulate hundreds or thousands of users accessing the application or particular business functions concurrently. Stress testing prevents bottlenecks, unexpected system outages, and maintenance repairs during critical business operations.

Implementation Approach
Proper visioning, extensive planning, and methodical execution were noted in the concluding remarks. ERP and contract writing systems should not be rushed into or quickly implemented. By creating a sound vision and methodical plan for execution, project delays, internal struggle with business benefits, and poor user adoption can be prevented.

In conclusion, the interviewed agencies that deemed themselves most successful were the ones that utilized lengthy planning activities, highly structured governance and project management teams, and fully leveraged enterprise-wide stakeholder teams. Which application was selected did not offer any impact to the success of the project as long as the contract writing system met the core business operation needs of the enterprise. However, trade-offs between deploying desired functionality and other project goals must be considered during evaluation. Implementation success is also highly dependent on user adoption of the contract writing system and the impacts it has on adjoining business disciplines, which should be addressed proactively using frequent and effective change management techniques.

Survey Background and Purpose

Defense Procurement Acquisition Policy (DPAP) conducted a survey of Defense and Federal Civilian organizations that have recently implemented, or are in the process of implementing, new contract writing solutions integrated or interfaced with ERP applications. The purpose of the survey is to gather anecdotal lessons learned of both the challenges and opportunities encountered by the agencies as they have attempted to incorporate Federal and Defense-specific contract writing capabilities into the core enterprise resource planning (ERP) capabilities. Similar lessons learned for integrating commercial off-the-shelf (COTS) and home-grown systems with the ERPs was also requested. Additionally, special considerations that should be considered by agencies considering deploying new contract writing solutions were also collected.

Methodology

DPAP developed a questionnaire which covered program background, software functionality, and deployment activities focusing on ERP implementations and contract writing capabilities. The survey was conducted by interviewing Federal agencies that have recently completed deployment (i.e., are in production state) of new contract writing solutions or are significantly underway (e.g., are beyond planning, conducting implementation activities). The discussions were open-ended with the questionnaire serving as a dialogue guideline. Some participants provided supplemental material. Additional research was conducted outside of the interviews to obtain additional relevant material either to the agency interviewed or on ERP implementation experiences and best practices in the Federal Civilian and Defense environments.

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Results

The following sections summarize the collective experiences of the interviewed agencies organized by main theme or topic, and identify key lessons learned and recommendations from across the interviewees. Additional agency-unique insights are also drawn. The individual interview reports provide detailed information from each agency interviewed, including the background and history of the agencies' contract writing system implementations.

Program and Project Management

All interviewed agencies stressed the need for strong program and project management. NASA, USDA, and DOE cited cross-domain participation as a key success factor while DLA cited executive board participation as a project 'saving grace' for solving issues, making decisions, and keeping the ERP implementation on track. Those that employed formalized governance structures, project charters with well defined roles and responsibilities, and cross-domain representation experienced better success with enterprise-wide business process and policy realignment, change management, user acceptance, and other deployment activities than those that did not. To facilitate these mechanisms, written agreements (e.g., memorandum-of understanding) should be executed between the offices for the duration of the project to cover funding, lines of responsibility, governance, and all other project issues. All agencies stressed the need for communications within the program and project management infrastructure to be formalized in terms of frequency, attendance, and media (e.g., formal status meetings, reports).

The establishment of cross-domain steering committees and working groups also helped identify upfront deployment activities and resource needs and issues that can be planned for, rather than reacted to, by the domain experts. This is particularly true for complex, interfaced solutions. Senior executive oversight and mid-level manager participation enabled access to higher quality resources and maintained project momentum. USDA in particular employed a highly structured program governance model including an executive steering committee, working level forums (both pre- and post-production), and user community forums to manage changes and their impacts across the enterprise. USDA's program is also part of the broader USDA technology management portfolio which undergoes an annual program and system evaluation to identify near term and long term changes and dependencies.

Conversely, the lack of a strong, integrated program management approach proved detrimental at DIA. Three systems, one core to procurement and two systems ancillary to procurement, were concurrently deployed with less than optimal cross-project planning, coordination, and communications. Lost between the projects were the more intricate decisions that impacted the solutions. The resulting solutions did not properly align from an end-to-end processes perspective and required avoidable rework. DIA imparted that a related lesson learned with numerous interfacing systems would have been for the team members to be taught a basic level of understanding about each application and its processes, and to have conducted end-to-end visioning in advance.

Other specific recommendations in the program and project management area include:

- NASA recommends that information technology specialists manage the implementation and production support aspects of the project, with business and functional experts deeply involved. USDA managed their program using the reverse approach with procurement owning the project and IT and other experts deeply involved. Note however that the USDA Procurement Systems Division focuses on procurement automation support within the Procurement Division, and is not a procurement operations division.

- DOE recommends that the project manager be the right person for the job regardless of certifications. DOE's perception is that the PM should be able to handle a project of the complexity of an integrated software environment, regardless of whether the person is a certified PMP. DOE provided a profile of someone who is both a visionary but also tactical, thick skinned, and tenacious.

The following points were inferred from interviewee experiences:

- Cross-domain integration and support improves communication and timing of essential activities such as policy creation and approval and security certification. These activities can take a substantial amount of time thus impacting project schedules if not properly planned for and shared across the organization.
- With all software lifecycles there is a sustainment phase that should not be overlooked. Post implementation and future project management activities such as software/hardware maintenance, change control for new functionality and impacting business processes, on-going change management for sustaining user engagement and satisfaction, policy changes, and performance metrics tracking must be considered.

Software Functionality

The scope of this report is intended to cover the implementation of Federal and Defense contract writing capabilities within ERP applications to include SAP and Oracle, and the so called 'best-of-breed' or 'pure play' contract writing systems interfaced to ERP systems. None of the agencies interviewed have implemented contract writing functionality within ERP (primarily financial focused) applications. The reason for this is simple. At the time of solution selection for the interviewed agencies, the major ERP applications available in the marketplace, while capable of supporting generalized commercial type procurements, did not have the capabilities to support Federal or Defense procurement and the unique legal, regulatory, and business requirements therein. ERP application support for procurement was found to be lacking in most aspects, most notably terms and conditions generation, CLIN and sub-CLIN structuring, RFx functionality, contract administration including ordering, and standard/optional forms data capture and generation. Other common procurement requirements such as milestones and workload assignment/management were also lacking. Consequently, most interviewees rejected the ERP applications as a contract writing solution. Recently, ERP providers have been working to include more robust contract writing capabilities through additional ERP supported application modules. In fact, DLA and CBP have provided SAP with a set of requirements to support their procurement needs. Both agencies have deployed SAP as their ERP for financial management and other administrative functions with the clear intention of migrating to SAP for contract writing. While we did not obtain similar information from other interviewees that have deployed the Oracle ERP, other research leads us to believe that Oracle is making similar efforts on the contract writing front. Further, agencies with deployed best-of-breed solutions interfaced with ERP applications have conveyed some exploration of the ERPs' capabilities to either improve their interfaces or to consider ERP solutions for eventual follow-on competition to the current contract writing solutions.

We also note that interviewees using the federally-focused best-of-breed procurement COTS applications stated that the applications generally satisfied their requirements with few major gaps and the providers continued to make improvements and add functionality in response to agency needs and market direction. They further noted that they generally accepted the applications' functionality and were able to work with it rather than develop enhancements to meet their requirements. Notable gaps in system capabilities included concurrent modifications and complex contract management ordering.

Common software functionality themes described across the interviewed agencies for their ERP and contract writing system implementations are described below:

- A common theme across all agencies was the focus on business processes when implementing the ERP application interfaced with a separate contract writing system. After performing business process modeling and gap analysis, agencies elected to adapt their business processes to the software's capabilities after ensuring that major business processes were covered by the application. Most agencies were uninterested in customizing the applications to meet the business processes needs, though we note DLA and CBP are essentially supporting SAP's

efforts to do so by providing their requirements. No software will meet every need, so agencies recommended considering trade-offs in selection and deployment. Successful agencies focused on being flexible while blueprinting the application with other business units and making trade-offs where needed. Several experiences stood out:

  - NASA recommended that during the evaluation and selection stages, agencies ensure that they understand exactly what functionality the proposed software can support and the level to which it supports the functionality. Extensive selection testing should be performed to make this determination.
  - DOE suggests removing non-value added process actions. DOE created workaround solutions for minor business process issues that were not satisfied by the application.
  - The Coast Guard suggests defining the ERP solution holistically for requirements, policies, and processes across all business domains.

- Each agency viewed team composition as critical when creating a software design team. Agencies stressed the importance of including representatives from each business unit, organization, and most importantly each interfacing system and business area (e.g., finance, procurement, accounting, asset management) to assess functionality and how it would be leveraged to support their areas. Experts across the enterprise are needed to map end-to-end processes, define requirements, review interface designs, and identify and solve compatibility issues. USDA and DIA both stated that basic level system functionality, business process understanding, and cross team knowledge sharing/teaching for all complex interfaces was critical when understanding decisions, new requirements, and the impact to each organization.
- Integration with the financial system proved achievable, but not necessarily optimal. Transmitting information to meet the needs of the target financial systems required operating at the least common denominator for the target system and in one case a minor change to the target systems. Common integration issues include:
  - CLIN/sub-CLIN level structures and CLIN/sub-CLIN funding could not be fully integrated. The problems stemmed from the ERP financial systems' inability to handle line item structure and detail transmitted from the contract writing system. Agencies should consider how closely corresponding transactions in each application should mirror each other and why. Much of this issue can be resolved through the interface if the target system cannot handle source system data and policies or practices cannot be amended (e.g., funding placed at the CLIN/sub-CLIN level in the contract writing system can be rolled up to a document level in the financial system if the ERPs cannot handle CLINS/sub-CLINs). Agencies strongly recommend a cross-discipline team of experts to examine interfaces with financial management and other business domains.
  - In DIA's case, policy and system capability forced the procurement operations to only fund awards at the document level. This is because the financial management ERP was deployed in a vacuum from the contract writing function and financial policy could or would not be changed to support the end-to-end views.
  - In CBP's case, the financial system is the source system for reporting. Data fields were added to the financial system to capture procurement-specific information for reporting.
- Agencies have mixed results with terms and conditions (T&C) maintenance and document generation. Agencies preferred the simplest approach and opted for template-based T&C selections over logic based solutions (it should be noted that T&C capability is only one of many factors in software selection and no agency selected software based solely on T&C capabilities). Specifically, NASA felt that approved templates provided a sufficiently narrow and proper set of T&Cs to select applicable T&Cs based on the procurement vehicle and procurement conditions while keeping procurement staff actively engaged in T&C review. The template approach was also perceived as a cost-effective approach for maintenance and to this end NASA built 34 templates for reuse. Other agencies employing the template approach created standard templates to tailor the documents to their business needs. USDA and DOE largely concurred with the NASA approach.
  - A drawback to most T&C selection and generation solutions concerns editing system-generated T&C documents and then regenerating the T&C list. Interviewees noted that regenerated T&C lists overwrite the T&C document if versioning is not part of the T&C solution. This forced users down one of two paths. The first path requires all work to be completed in the individual T&C in the online document with generation and formatting

saved until the end. This was the approach espoused by the project leaders. The other path chosen was creating and managing T&C documents outside of the contract writing system and attaching it to the online file. Under this approach, procurement documents are not always current with FAR and agency supplement T&C versions. It also lessens the effectiveness of the contract writing system. Although this issue was not experienced by all agencies, it is worth mentioning due to the amount of manual work it created for the users and inefficiencies in the contract process.

- Most agencies interviewed stressed the need for gathering reporting and business intelligence requirements early in the implementation process before software design. COTS software will either provide standard reports or report writing capabilities. Agencies should understand these capabilities and how well the reporting solutions meet their needs during the selection stage and plan for additional work during the implementation. Agencies interviewed often underestimated the effort needed for identifying and correctly developing the reports, and moved into the production stage prior to reports availability. While this was done in consideration of overall project goals, lack of data visibility hampered procurement operations.
    - Specifically, agencies interviewed stressed the importance of identifying the system of record for reporting data elements. If a single system is identified as the system of record, then it must be ensured that it captures needed information from feeder systems. This may require creating additional data fields or tables to capture comprehensive information from other system data feeds as was done at CBP.
    - Agencies using multiple source systems reported difficulties in developing efficient report writing solutions. This is especially true after migration to the new contract writing solution where records are partially migrated (e.g., base awards and some delivery orders remain in the legacy application and new delivery orders are executed in the new application). In these cases, a centralized data warehouse is worth consideration.
    - DOE and USDA recommended implementing data warehouses for data capturing and reporting. A data warehouse allows for data to be fed from multiple applications to create all reports. This approach cuts down on the amount of application customization needed to provide desired reports, allows for optimizing the structure of reporting data, and does not tax the contract writing system operations.
    - The Coast Guard suggests considering not just procurement operations data needs but critical data needs from external entities, such as FOIA and Congressional Affairs Offices, as part of the universe of reportable data.
- Agencies recommend software upgrades be identified and planned within the agency's maintenance schedules. This includes releases of new application baseline functionality, service packs, and enhancements if dealing with a highly customized application. Software maintenance impacts training program timing, system support, and overall release of new functionality and should be planned respectively. CBP reinforced that software should remain current based on the support packs or releases and include adequate support from application providers and implementation and integration support vendors during and after implementation.
- One of the primary benefits of using a COTS contract writing system interfaced with the financial management application is the ability for users to view end-to-end transactions. Given proper system access and security profiles, a user who creates a requisition can see downstream transactions such as contracts, delivery orders, and invoicing. A fully integrated ERP with contract writing sharing the same application code as financial management improves this capability. Agencies providing cross-system access note that security concerns should take precedence over process needs, particularly for sensitive data access such as employee social security data, vendor bank account numbers, and the like. Examples of cross system views from the interviewees include:
    - CBP allows requisitioners to view a solicitation online as well as the pre-award milestones in the contract writing system. CBP also allows payment technicians to view a contract online to access the payment terms. User access is controlled by role authorization and profile creation.
    - DIA notes that an agency performing a similar effort consider security level issues such as personnel system access through the integrations and ensure privacy is maintained.

Other significant experiences worth mentioning are included below:

- Where possible, restrict or remove use of legacy systems once the new contract writing solution is in place. DOE and USDA note that doing this quickly reduces IT maintenance costs, removes undesirable practices and processes, and allows the agency to reap the maximum benefits of the new solution. The only reasons interviewed agencies permitted use of the legacy systems was to close out non-migrated transactions and for reporting purposes. Closeout was generally limited to a specific period of time. The same reasons for sun setting legacy systems apply to homegrown and shadow systems.
- DIA noted that processes which are not thoroughly analyzed and configured will cause unexpected usability issues. Be prepared to reconfigure the software and develop temporary process alternatives until permanent resolution.
- DIA notes that new requirements may frustrate the user community because the users are unable to perform the same quality work in as an efficient manner as with their legacy applications. DIA noted that their new solution's tighter controls eliminated some of the 'holes' in the legacy procurement application with the final result a more reliable product. The DIA procurement application can now be counted on as the central contract repository consistent with the documents sent to the vendor community. Agencies should proactively identify for its users both improvements and new constraints imposed by the contract writing system, and ERP interface if applicable, including why the constraints are needed. These should be portrayed as improvement trade-offs (e.g., increased internal controls) for the wider enterprise goals of the ERP project.

Change Management

Of all the lessons learned from each agency interviewed, change management was clearly identified as the number one priority for successfully implementing an ERP and contract writing system. As USCG stated, "Don't underestimate the importance of change management." Dedicated funding and available resources to carry out change management activities, including training, communications, team participation, and help desk support, was strongly endorsed by all agencies. Common change management themes described across the interviewed agencies for their ERP and contract writing system implementations are described below:

- Stakeholder involvement and cross-discipline teaming was deemed the most critical success factor for supporting contract writing implementations (other than software functionality). Participation from all organizational levels of affected stakeholders is vital. Vertically, executive support helps bring needed resources to the project while middle manager and staff-level involvement represents operational expertise. Also, stakeholders from higher levels become more important in ensuring and enforcing consensus decision making when a large number of disparate organizations are coalesced under a single solution, as occurred at NASA, DOE, and USDA. However, their presence should not impede participation or creativity through directives, but rather should create the needed collaborative, consensus-building atmosphere. Horizontally, representatives from other systems projects and business administrative areas are required to ensure seamless integration of software and business processes. Those agencies that consciously and proactively involved affected stakeholders viewed their implementations as more successful than those that did not. Stakeholders of varying levels should be responsible for participating in working sessions, crafting messages, and supporting the user community throughout and after the software implementations. Noted recommendations on stakeholder involvement are:
    - NASA suggested including system success as part of the manager's performance plan to promote fuller adoption of the new solution (technology and business processes) and the abandonment of legacy solutions.
    - DOE created change agents to support end users.
    - DLA hand selected, trained, rewarded, and empowered team members to deliver their solution.
    - DIA noted that teams working on adjoining systems should regularly attend each others' meetings and transfer knowledge across the projects.
- Terminology discrepancy was cited as a major impediment to project success. Systems terminologies vary widely as does the terminology differences between the financial management and procurement management disciplines. Combined, they can cause constant friction, especially with project members talking across each other. This caused rework at several agencies for

interface and reports development efforts due to poor design and execution based on misunderstanding. NASA in particular recommends addressing this issue head on to make the translations early in the project life-cycle.

- All agencies used a form of targeted messaging to communicate business benefits, business process changes and impacts to the organization, and new system functionality. Each agency developed tailored messaging and identified communication frequency for every level in the organization. Different forms of communications were used such as frequent newsletters, executive briefings, FAQ's and surveys. Specific recommendations of note are:
    - DOE suggested the messages be depicted in the context of the wider benefits to the department, not just procurement-centric benefits.
    - NASA recommended using surveys to allow the project leaders to identify issues, take corrective actions, and report to the project steering committee. All messages were delivered by top down approach to ensure effective communication throughout the organization.
    - CBP noted that senior executives get involved but don't always push down the messages, and that senior executives are not daily users. While senior executives can articulate the strategic visions and strategic need, only the mid-level managers and end users can craft the true solution and the accompanying messages.
- Quality training was the focus of every agency. The majority of agencies offered instructor-led classes for procurement officials and computer based training (CBT) courses for requisitioners. Funding was a factor in the ability to delivery instructor-led classes for all users, although most agencies specified that if an organization was willing to pay, additional instructor-led training could be provided. Alternate training media employed included webinars, webcasts, and tutorials. Although not consistently offered by every agency, these techniques allowed for additional training outside already offered courses. Most noted that training quality significantly affected the success of the project. Specific training items of note are listed below:
    - Most agencies recommend customized training on the agency's processes if possible. If not, use agency-specific examples as training exercises. Either way, information on how the agency will use the contract writing application should be imparted to the users above and beyond the generic COTS capabilities. Also, include process and policy changes based on the implementation as part of the training.
    - DIA recommends including system interfaces as part of the agency training. The complexities of these business processes should be explained to users during training.
    - DLA recommends refresher training and new training for new features.
- All agencies in production employed, and recommend, a multi-tiered help desk for post-implementation software support. Specific help desk items of note are listed below.
    - DHS and CBP suggested creating local administration (i.e., power users) as the first line of support. Power users can often resolve issues without needing to call the help desk. Since they are co-located with the user base, power users often serve as ad-hoc instructors. Power users are extremely effective if the proper communication channels are set up for questions. It was noted that some agencies conversely had users contact the help desk first before being routed to a power user for support.
    - USDA established a parallel customer care offering to assist newly deployed agencies with learning the new software and new business process and policies. Customer care was staffed by members of the implementation team versed in system configurations and intended system usages at the individual USDA agency.
    - NASA established "war rooms" to test the help desk capability before and just after deployment to smooth out support processes and knowledge.
    - DIA expressed that a knowledgeable help desk that has been trained in, and even participated in the development of, the software is essential. DIA further noted that help desk staff should be versed in the integrations to support end-to-end processing. Help desk staff that focus on the contract writing system and don't understand how or why the interfaced systems work are not as effective in serving the needs of the contract writing community.

Testing

All interviewees stressed the need for extensive testing in conformance with system development life-cycle (SDLC) best practices. At a minimum, unit, business scenario, integration, user acceptance, security, volume and stress, and regression testing should be performed, as needed, prior to functional and technical readiness reviews for go/no-go decisions of initial user, new releases, and technical upgrade deployments. Additional testing cycles should be performed as needed. Interviewees divulged mostly common system implementation experiences.

Specifically, interviewees recommend the following:

- When selecting an ERP contract writing solution, DOE recommends performing extensive scripted and unscripted testing during the evaluation stage. While no solution will be perfect, only evaluation testing and proof of concept will help the enterprise select the option that most closely meets its needs.
- Testing should be customer driven with participation from across the end user base to ensure system configurations meet enterprise business process needs. DIA recommends leveraging in-house experts prior to deployment and using real-world examples as test scenarios.
- Test scripts should be written to cover the enterprise end-to-end processes, not just from one system to the next. Complex interfaced and integrated ERP solutions require complex test scenarios to determine downstream and upstream impacts and proper configurations to meet business processing needs.
- The needs and limitations of interfaced systems and how they influence each other should be specifically examined.
- Customized applications cannot be tested using standardized test scripts from other implementations. When upgrading customized solutions, testing is required for both the customized application and the interface between the customized system and interfaced systems. USCG suggests planning extended testing cycles when deploying customized solutions.
- Testing cycles should be iterative and of sufficient length. CBP recommends a four- or five-week test cycle with each new release, service pack, or patch, including mock cutover testing.
- CBP recommends investing in an automated tracking tool to manage testing issues.

The following points were inferred from interviewee experiences:

- Test scripts should be written by and reviewed with all affected stakeholders to ensure completeness across the enterprise business processes.
- When developing requirements and designs for new functionality and interface enhancements, include all affected stakeholders to ensure completeness across the enterprise business processes.
- Despite best efforts, software functionality, system configuration, and process support issues will be uncovered during testing and system use periods. All resolutions to these issues should be retested and documented in system designs, test scripts, and cutover activities immediately to ensure they are not lost over time.
- Proper test preparation is important to ensure a comprehensive testing cycle. Ensure adequate testing environments as well as pre-established test data for all testing cycles and users.
- When developing testing scripts, consider creating negative testing scenarios and scripts. This ensures that the system and business processes are not ‘breakable’ by users. In many cases flexible business processes will create additional testing scripts and scenarios not previously contemplated. Creating negative testing scripts and identifying testing issues ensures that the system locks down the business processes and prevents deviations from organization best practices.

Data Migration/Conversion

Data migration/conversion (migration) activities varied widely across the interviewees. Some agencies performed as full a migration effort as possible. Others performed none at all due to poor legacy system data, cost, too diverse a set of legacy systems, and other factors. Migration efforts are among the most complex and potentially costly activities of moving to a new contract writing solution given most systems are not readily compatible with legacy data standards, business logic, and configuration standpoints. Also

of great complexity is the synchronization of migrated transactions with other ERP systems. Without proper care, the migrated data may not match legacy transactions and corresponding interfaced system records. Duplicate processing might then occur (e.g., doubling obligations).

To best achieve data migration goals, the interviewees recommend the following:

- It is critical that migrations be based on careful analysis. NASA and USDA recommend developing specific criteria transactions must be met when developing a data migration plan. Agencies should consider type of award, periods of performance (contract completion and option periods), legacy system shutdown dates, business needs, and other parameters. USDA left open its legacy systems for six months to complete and closeout transactions in the legacy systems to reduce manual migration efforts. They also provided customer care support to end users manually migrating data.
- Because migration activities can be complex and expensive, DOE recommends assessing the requirements and scope of the migration and making needed tradeoffs between migration and other project activities relative to available project funding.
- Automated conversions are complex and costly in terms of requirements and designs, development, and testing efforts compared to manual conversions. Manual conversions require less effort for these activities, but more time for data entry. The analysis effort for both methods is roughly the same, though somewhat higher for the automated approach to account for internal database data (e.g., internal UIDs).
- Each migration effort is unique to the agency's goals. Most interviewees migrated as much information as possible, even if it was not as discrete data. For example, terms and conditions can be migrated and managed as a word processing document, rather than recreated using individual terms and conditions in the target contract writing system.
- Plan for migration issues in the project plan. Migration must occur just prior to use of the new ERP. Time and resources must be allotted to quickly manage data clean up issues. To that end, we inferred that many mock conversion tests should be performed prior to the migration to production use to minimize errors. Migration tests can uncover issues that users may experience downstream when trying to complete follow-on actions (e.g., contract modifications, delivery order modifications) to transactions that have been migrated over to the new system.
- If a data warehouse currently contains sufficient contract writing data for reporting purposes, consider this in the migration approach. A data warehouse can also be used for storing unconverted data if deemed valuable. By using a data warehouse that is also used for reporting, agencies can sunset legacy applications instead of keeping them operational for record retention.

We inferred the following points from interviewee experiences:

- Unconverted contracts/awards create cost and reporting issues since they require legacy systems or word processing to manage until expiration and cannot be rolled up into automated reports.
- For NASA, old funds citations proved most troublesome given the conversion from legacy financial management systems to the ERP just prior to moving to a new contract writing system. We inferred from NASA's experience that a holistic approach to data migration is needed across the enterprise, similar to the recommended approach for requirements development, business process modeling, and testing activities. This allows for data migration requirements consolidation to prevent duplicate migration activities.
- Do not migrate long term contracts piecemeal. DLA attempted such an approach by initiating new orders in the new solution and managing base awards in the legacy system. The approach caused reporting and traceability issues.

Technical Issues

Few of the interviews covered technical issue due to time and resource limitations. However, the following highlights were provided:

- Access to the system should be based on agency needs. Most agencies require the system to be available during normal business hours, accounting for time zone changes (e.g., 6:30 a.m. EST to 8:00 p.m. PST).

- Schedule and advertise downtimes in advance for routine maintenance, updating of T&Cs, and other needs. If possible, schedule downtimes and interference activities for off hours and on weekends.
- Ensure integrations between the ERP and contract writing solution maintain proper traceability for documents, lines, and other data as the agency chooses to define them.
- During the evaluation and implementation testing cycles, perform significant stress and load tests. Some interviewees reported system slow down during peak times or when running large reports. Network and system performance testing is needed to understand throughput constraints on the procurement system and the networks on which data travels. Plan for upper range volumes even if they only rarely occur.
- USDA recommends frequent tracking of network usage since a major contract writing COTS/ERP solution utilizes a high level of resources. USDA also recommends investing in dedicated database administrators and network engineers to support the effort.
- USDA also notes that issue ownership is sometimes hard to pin down between applications and recommends decoupling the interface to ease correcting issues.

Concluding Remarks

Common concluding remarks and insights include:

- Interviewees could not readily quantify cost savings and performance improvements from implementing contract writing solutions, though most felt some had been achieved. Only USDA cited specific examples, citing improved staff utilization due to greater visibility of workforce activities and improved reporting capabilities.
- Most interviewees believe a key success factor is proper visioning, extensive planning, and methodical execution. Most noted that not everything will work out perfectly, but with persistence most issues can be overcome.
- Most agencies indicated that a governance structure involving stakeholders across all affected stakeholder business domains should be established to coordinate the approach to the satisfaction of all parties.
- Most agencies concluded by stressing the importance of involving cross-enterprise stakeholders. Support and commitment from not only the highest levels of management and stakeholders but also the mid level managers is essential. CBP recommends exchanging experts from each domain in a cross-training program to ensure knowledge transfer, while DIA noted its issues stemmed from not including enough end user involvement.
- Most agencies concluded by stressing the importance of expending sufficient effort for change management and reporting activities throughout the entire project life-cycle.

Key agency-specific concluding remarks and insights include:

- CBP recommends remaining current with ERP/COTS releases to avoid prolonged and complicated upgrades. Upgrading to several releases at once usually requires successive upgrades and application providers do not normally provide ‘leap-frog’ upgrade scripts. Remaining current also permits an agency to take advantage of new functionality and issue resolutions
- DIA concluded that completion of a thorough business process re-engineering effort to include all functional environments impacted is essential to ERP implementation success. A comprehensive, common understanding of new business rules that will have to be implemented is essential in order for the ERP applications and users to operate successfully.
- DOE concluded that funding and people resources constituted its largest challenges and recommends that an agency performing a similar activity make a judicious effort to wisely expend these resources, make reasonable trade-offs, and properly plan a critical path for the implementation and the functionality to be implemented.

Individual Survey Results

This section provides detailed information obtained from interviewing Federal and Defense agencies for this report.

National Aeronautics and Space Administration (NASA)

Interview attendees included Ken Stepka, NASA; Lisa Romney, DPAP; and Saul Goldberg, IBM.

Program/Project History

Prior to the mid-1990s, NASA's procurement operation was comprised of ten autonomous regional operating centers and one headquarters operating center with a decentralized structure, disparate automated systems, and localized processes. No integrations existed across the operating centers or between the local procurement solutions and other local administrative systems. In the mid-1990s, NASA attempted to build and deploy a custom core financial management solution that proved a costly drain on its resources and fell short of expectations. Under pressure from Government oversight entities such as GAO and OMB, NASA reinvigorated the effort under the Integrated Enterprise Management Program (IEMP) using SAP's R/3 Core Financial as the foundation ERP solution. SAP R/3 was fully implemented in June 2003 with an upgrade to mySAP in 2006.

The vision of a single enterprise-wide application for core financial management was subsequently leveraged for other administrative areas under IEMP, including other financial management disciplines, acquisitions, travel, and human resources. Consequently, NASA decided to select a COTS solution for its contract writing and procurement functions. An initial examination and attempt to use SAP's purchasing module determined that it lacked the capabilities to support Federal procurement requirements. The procurement community determined that an open market competition was needed to acquire an acceptable solution.

As a first step, NASA organized a procurement team from across the ten regional centers for inclusion in the planning, evaluation, and selection processes. An executive steering committee including NASA executives, project executives and procurement officials was also developed. The inclusive team developed functional requirements and decided to make a buy using GSA schedules. Market research was conducted with leading federally-oriented COTS procurement software vendors (DSI, CACI, Compusearch, AMS, and SAP iPro). A competitive sourcing event was completed with Compusearch's PRISM as the selected application. Upon selection, NASA embarked on a two-year cycle of planning, business process modeling, and system configuration.

NASA deployed the Contract Management Module (CMM) enterprise-wide in 2006 in single deployment approach. The initial year was considered somewhat rocky due to learning curves, software issues (e.g., gaps in functions needed by NASA, coding), and integrations. Change management shortfalls also contributed to some of the adoption challenges. CMM is currently in operations and maintenance (O&M) mode and NASA has been making strides on the stabilization and adoption fronts.

Program and Project Management

CMM is owned by the office of the Chief Information Officer (CIO). The CIO's budget covers the project for O&M and sustainment. The procurement office requests funding from the CIO's budget to advance the CMM project. NASA recommends that other agencies follow this model whereby the information technology specialists manage the implementation and production support aspects of the project, but the business and functional experts are deeply involved. To facilitate the relationships, NASA further recommends written agreements (e.g., memorandum of understanding) between the offices for the duration of the project to cover funding, lines of responsibilities, governance, and other project issues.

One of the biggest keys to NASA's success with CMM has been the establishment of a cross-domain steering committee that meets regularly and discusses issues holistically to NASA operations. Another

has been an engaged end user base. A philosophy of open communications and feedback allowed the administration to properly plan the project and meet customer needs.

Software Functionality

NASA stated that the software meets most of its needs but that they are pushing it to its limits, particularly for the most complex contracting acquisitions. Highlighted software functionality related topics are as follows:

- NASA identified 224 requirements with a stop-light rating system applied to each one. NASA did not provide statistics, but noted that most requirements rated green with a few rated red. The CMM team decided to proceed to production with a few red rated requirements given the need to meet project goals and keep the project on schedule. Acceptable mitigation plans were derived to address the gaps.
- NASA deploys service packs, patches and COTS software releases to remain current with PRISM releases and recommends that other agencies deploying any software technology remain relatively up-to-date to take advantage of new functionality and software fixes. NASA imparted that it is not interested in customized enhancements that do not roll into the CMM product baseline, although it may be willing to pay a portion of an enhancement that is baselined depending on the importance of the enhancement to NASA's business operations.
- Procurement business processes have been standardized across the ten operating centers due to the move to a single platform. Some business processes have been modified to meet CMM limitations, and a few processes require minor, but inefficient, work around steps. On a whole, the solution essentially meets NASA's needs. While the SAP FM ERP has made significant changes to NASA's operations, CMM's impacts to procurement operations have been much less dramatic.
- Purchase requests/commitments originate in SAP and are transmitted to CMM. FAR-based procurements, grants, and agreements are processed in CMM and transmitted back to SAP where they are matched with their purchase requests, funds are obligated, and commitments are closed. Invoices, receipts, and payments are completed in SAP.
- NASA determined that a template/checklist approach was preferred over an automated logic-based solution for terms and conditions (T&C) selection. Logic-based systems could not be controlled by NASA and were felt to be a "dumbed-down" T&C solution. NASA felt that approved templates/ checklists provide a narrow and proper universe of T&Cs that allows its staff to properly select applicable T&Cs based on the procurement vehicle and procurement conditions. The template approach also keeps procurement staff more actively engaged in the T&C review. The template approach was also perceived as a cost-effective approach and to this end NASA built 34 templates for reuse.
- CMM requires users to select a template and work with the T&Cs on line and then generate a T&C document. However, if users make changes to the online T&Cs and then regenerate to include the changes in the word processing document, they lose all formatting in previously generated and formatted word processing document. This is because the newly generated T&C word processing document overwrites the previous word processing document. This has prompted many users to build T&Cs outside of CMM and attach them to the online documents. Users are losing current FAR and NASA supplement versions as well as lessening the effectiveness of the template approach.
- NASA noted that concurrent modification support is insufficient and has negatively impacted complex contract management.
- NASA noted that commodity line items are not identical between CMM and SAP due to SAP limitations. Information passed between the two is merely sufficient to create the records in the respective systems. Also, the SAP FM funding model forces all funding to the document level in CMM. NASA would like to fund at the CLIN level and down to several sub-levels, but has deferred that capability until SAP is able to support the procurement CLINS and funding models.
- NASA built 16 milestone plans for reuse using the current milestone configuration capabilities.
- The NASA team noted that its overall reporting solution using CMM is a work in progress. Terminology issues caused miscommunications between procurement experts and reports writers on the Business Warehouse team. By way of example, NASA noted that one of their more important challenges is workload management reporting. While the CMM solution allows managers to assign and track work to staff (i.e., transactional basis), they are unable to use that

information for workforce planning (i.e., strategic basis). The CMM team turned toward the IEMP Information Delivery Team to provide the needed views from the Business Warehouse database, but reports were difficult to render in a usable format. In another example, NASA maintains piecemeal records across multiple systems. As a result of maintaining unconverted data in multiple data warehouses and FPDS reporting issues, data gathering from past records remains a major issue.

- On a more general note, NASA stated that its reporting strategy and tools, as an organization, is its biggest problem. The CMM team further noted that they did not emphasize reports and business intelligence until after the post go-live timeframe. NASA recommends that any agency undertaking a similar effort place reporting and business intelligence at the forefront of the project with as much focus as on other activities (e.g., business process modeling, system configuration).

NASA recommends that during the selection and evaluation stages, agencies ensure that they understand exactly what functionality the proposed software can support and to what level it supports it. Not all software will meet every need, so trade-offs will need to be considered. To properly assess the software and understand the trade-offs, perform extensive acceptance testing using real examples, a comprehensive set of business processes, and subject matter experts who will be using the system.

Change Management

Change management and the cultural shift was a massive issue for NASA. Each of the 10 centers and headquarters were previously operating autonomously and accustomed to their own processes and technology solutions. CMM moved procurement operations onto a single shared platform wherein the affected constituents had to achieve consensus on system configurations and usage, procurement policies, integrations, and address other common platform issues. The level of change varied across the operating centers with some bearing a larger brunt of the burden than others.

Terminology inconsistencies were rampant. SAP terminology and CMM terminology vary widely. Coupled with the terminology differences between the financial management and procurement domains, application terminology caused constant friction, especially on the reporting front. Translating across the terminology divide was deemed a key to success.

For help desk support, NASA established “war rooms” to test the help desk capability before deployment and just after deployment to smooth out support processes and knowledge transfer. The CMM team felt that they could have benefited by keeping them operational for a longer time period.

On the training front, NASA employed instructor-led classroom training on the generic COTS product. NASA examples were used for exercises. NASA recommends agencies utilize agency-specific customized training, schedule and budget permitting.

NASA recommends continuous follow up surveys of end users. The technique allows CMM project leaders to identify issues, take corrective actions (on a monthly basis), and report to the project steering committee.

NASA recommends that any agency undertaking a similar effort place special emphasis towards including all stakeholders in working sessions and major decisions in addition to targeted messages to affected constituents. Messaging should be frequent and speak to the concerns of each constituency. Also, NASA suggests including system success as part of the procurement manager’s performance plan to promote fuller adoption of the new solution (technology and processes) and abandonment of legacy solutions. The lesson learned from the CMM deployment is that one cannot do enough change management activity.

Testing

NASA employed three rounds of functionality testing (unit, system, and user acceptance) prior to functional and technical readiness reviews to make go/no-go decisions. Testing was customer driven and included participation from across the end user base to ensure system configurations met business process needs.

Data Migration/Conversion

NASA developed specific criteria to determine which documents were converted from the legacy systems into CMM. NASA determined that most historical data could not be automatically migrated into CMM and a manual effort for all data would be labor intensive and too costly. Converted documents were manually entered into CMM with as much information converted as possible. Unconverted contracts/awards have been an issue since they require legacy systems or word processing to manage until expiration and cannot be rolled up into automated reports. Unconverted data, if previously entered in a data warehouse, was left there.

For converted transactions, old funds citations proved most troublesome given the conversion from legacy financial management systems to SAP just prior to legacy procurement system conversion to CMM.

Technical Issues

NASA reports no major technical issues. The solution is available 99% of the time and is only off line at night to update T&Cs, address issues, and perform scheduled maintenance. Integrations with CMM to SAP financial management maintains proper traceability and has been very good. The biggest issue is that some reports take a long time to run.

Concluding Remarks

NASA believes that the results of implementing CMM paired with SAP have been mixed. Cost savings, FTE savings, and productivity improvements have yet to materialize in any significant way, although the automated process has improved somewhat. The administration believes that these benefits may come later when open issues, specifically reporting, can be resolved.

NASA lastly recommends that agencies implementing contract writing solutions with ERPs focus on change management and reporting as these are two areas that the software applications by themselves either do not support as part of the implementation or only provide tools.

U.S. Department of Agriculture

Interview attendees included Ruby Harvey and Walter Rossi, USDA, Jason McKnight; Lisa Romney, DPAP; and Saul Goldberg, IBM.

Program/Project History

In 1996 USDA recognized the need to re-consider the technology supporting its procurement business. With ten existing systems, variance in compliance with regulations, multiple varied business processes and data stores, no financial integration, and no end-to-end capability, the Procurement Modernization Team (PMT) developed a Program Assessment Report to identify alternatives and opportunities. The PMT envisioned and developed comprehensive Program Management, Change Management, and Communication Plans, re-charted the Procurement Management Team, and developed other supporting resources to obtain funding. In Q1 of FY2001, USDA submitted an OMB Exhibit 300 and shortly thereafter began developing the acquisition strategy.

The Procurement Solutions Division (PSD) was chartered as the program management office (PMO) for the project. PSD established a steering board with members of the eleven agencies with procuring authority and various executive offices. In 2001, PSD conducted a market review and determined that ERP solutions did not contain robust contract writing capabilities and were unable to support Federal procurement requirements. Some ERPs were not fully web-based, which was a major USDA requirement. In Q2 FY2002, PSD conducted an open market competition and selected a solution that combines Oracle iProcurement for requisitioning and receiving, Oracle Core Apps for invoicing, and Compusearch's PRISM for core procurement and contract writing functions, to integrate with its Federal Financial Information System (FFIS) financial management system. Oracle and PRISM are interfaced via the Oracle-

Compusearch Integration (OCI) while WebSphere MQ Series handles the integrations with FFIS. A vendor portal/e-sourcing component is planned. Potential extended functionality may include eCatalog (likely in Oracle iProcurement), eRFx, eInvoicing, and integration with asset management.

The resultant Integrated Acquisition System (IAS) is a single instance, web-based procurement solution that replaces ten legacy procurement systems at eleven USDA agencies with procuring authority. IAS was implemented as a cost savings measure to replace multiple legacy systems and provide end-to-end procurement integration with financial management and other domains (e.g., asset management). IAS standardizes procurement processes and policies, facilitates agency and USDA-wide reporting capabilities, and meets the goals of the President's Management Agenda and other e-Government mandates (e.g., IAE). Further, IAS was implemented to meet the goals of OMB Circular A-123 for financial management controls and has served as a platform for meeting other governmental mandates (e.g., the Transparency Act) and procurement best practices (e.g., meeting small business award reporting requirements). IAS supports the CIO's technical goals and is the first system within USDA to use a true enterprise approach from the start.

While IAS is connected to multiple instances of FFIS, it is viewed as an enterprise system, not an ERP system, due to its singular focus on procurement. IAS integrates ten distinct USDA agencies and executive offices, supports 24,000 users, and standardizes processes and technologies, improves internal controls, makes data more accurate and accessible, modernizes the technical platform, and strengthens the relationships between the program and contracting offices.

The project is six years into a ten year life-cycle, has been deployed to all USDA agencies with procuring authority, and is currently in the Operations and Maintenance (O&M) stage. USDA plans to conduct a due diligence review of SAP's procurement capabilities as SAP is being implemented as USDA's financial management system replacement of legacy FFIS under the Financial Management Modernization Initiative (FMMI). PSD is currently working with the FMMI team on the integration design between IAS and FMMI and is also exploring FMMI features and capabilities for improvement opportunities under IAS and post-IAS.

Program and Project Management

The project is owned and run by the procurement community. The Chief Acquisition Officer in USDA is the lead executive and the project is executed by PSD. At the outset of the project, each USDA agency agreed to support IAS and provided agency experts to support the project. Memoranda of understanding are signed between PSD and each agency. The Chief Financial Officer's office was also brought in to support the planning and deployment of IAS, specifically with the integration between IAS and the FFIS instances. The Chief Information Officer's office provided needed expertise as well. The CIO and CFO points of contact assisted with the deployment at each agency as needed. Subcommittees were established to develop requirements, evaluate sources, and oversee business process and policy integrations.

The IAS Steering Board (ISB) manages the project. The ISB is co-chaired by the Senior Procurement Executive and Deputy Chief Financial Officer. Membership also includes the Heads of Contracting from the ten procuring agencies. Procurement Policy, Office of the Inspector General, Office of the Chief Information Officer, and Office of the Chief Financial Officer are also represented.

Working level forums include an End User Forum, Business Process Subcommittee, and Change Control Board. Each has participation from various representatives from the aforementioned offices and end user community.

IAS, like all USDA systems, undergoes an annual program and system evaluation to identify changes in the near future (e.g., 2-3 years) that will impact the system as currently designed. The review includes technical architecture, functional usage, business process, policies, and cost impacts. IAS is assessed as an individual procurement solution and as a part of the USDA technology portfolio.

Software Functionality

USDA stated that the IAS software meets most of its needs. IAS supports a $2B spend in FAR-based procurement transactions (e.g., letter contracts, definitive contracts, IDIQs including post-award orders, BPAs, simplified acquisitions). Highlighted software functionality related topics are as follows:

- USDA awards most types of common procurement vehicles and feels that the IAS functionality meets their procurement support needs with no major functionality gaps. A few enhancements were developed to meet specific business requirements, but most focus on the interfaces between the IAS systems rather than the systems themselves. Where possible, USDA leverages the system configurations to meet business needs and avoids customizations. Policy and process changes were instituted to meet the limitations of IAS but also to support the stated goals of IAS. No changes were needed to accommodate major functionality gaps. The one gaping hole cited is sub-CLIN integration between IAS and FFIS which has forced USDA to support certain transactions at a least common denominator level; FFIS cannot handle sub-CLINs. On a positive note, the implementation of IAS allowed USDA to more closely examine its fire buys (procurements made in emergency situations where access to USDA systems is remote or non-existent) and make several process improvements rather than software changes.
- USDA determined that a T&C template/checklist approach was preferable and established USDA templates. Users select the appropriate template and tailor the contents by adding/deleting FAR and USDA T&Cs, and modifying T&C contents. The user then generates the selected T&Cs into a coherent document. However, if users make changes to the online T&Cs and then regenerates to include the changes in the word processing document, they lose all formatting in previously generated and formatted word processing document. This is because the newly generated T&C word processing document overwrites the previous word processing document. This has prompted many users to build T&Cs outside of IAS and attach them to the online documents. Users are losing current FAR and AGAR supplement versions as well as lessening the effectiveness of the template approach.
- USDA notes that ad-hoc reporting has been an issue with IAS. While the standard reports provided with the IAS applications have been adequate, the ability to easily access other data or in different representations has been difficult. USDA is moving to a data warehouse with a core reporting software. USDA recommends that agencies focus on reporting capabilities of the procurement software and their overall reporting requirements early in the pre-implementation stages and not wait until after deployment to address the reporting issue.
- USDA offered two recommendations to other departments and agencies undertaking a similar effort. First, understand the other applications the procurement solution will interface with (or ERP application modules with which the procurement module is integrated) and make sure the counterparts who own those applications understand the procurement solution. Familiarity sessions, demonstrations, discussions, and joint activities will ensure that businesses process and data exchanges go smoothly. Second, be flexible with the calendars of other impacting projects. Collaborating on project schedules and constant communications will help create a better path for each project.

Change Management

USDA undertook major change management efforts prior to the IAS implementation and continued to do so as each agency began implementing and using IAS. USDA imparted that while IAS has been a six year effort, so too has change management been a six-year effort. For each agency, USDA appointed a PSD Bureau Representative and dedicated implementation team. The PSD team's role was to provide program education to the agency, execute on all implementation activities to shepherd the agency from legacy system to IAS, work with and resolve issues, and keep all PSD commitments to the agency. These commitments included all IAS general commitments between PSD and the agencies as documented in memoranda of understanding, but also all agency deployment-specific commitments. PSD also undertook change management communications to all agency executives at the start of the IAS program and each agency deployment. Messaging was also provided to agency staff with particular emphasis on the agency implementation team leaders.

While USDA established a help desk, a routine activity for any software deployment, USDA established a parallel customer care offering to assist newly deployed agencies with learning the new software and new

business process and policies. Customer care included on-site and phone accessible experts versed in that agency's IAS implementation (i.e., members of the agency's implementation support team) that users could turn to within the first month or deployment prior to calling a centralized help desk. At the agency's discretion and funding, the embedded customer care offering is available for an extended period of time.

Instructor led training was provided to all agency procurement users by the application provider with each deployment. Requisitioners received CBT training. Since all agencies with procurement authority are in production, training for new IAS users is now provided by a USDA trainer. Webcasts are employed to provide training on new features with each IAS release to the baseline IAS applications, new enhancements, and business process changes.

Testing

USDA employs a functional testing approach using three rounds of system testing (unit, system, and user acceptance) and functional and technical readiness reviews to make go/no-go decisions on new releases. Testing is customer driven and includes participation from across the end user base to ensure system configurations met business process needs. USDA schedules two releases a year in May and December.

Data Migration/Conversion

USDA did not perform automated conversions/migrations of transactions from legacy systems due to the diverse number of legacy systems making the effort cost prohibitive. Also, legacy system data was mostly of poor quality. USDA employed the PRISM reconstruction functionality and let each agency determine which records to manually recreate in IAS. Most chose to enter a very limited number of transactions.

USDA's approach left legacy systems available for six months after IAS deployment to complete and closeout transactions in the legacy systems. During this six month period, users were also given the opportunity to perform the reconstructions in IAS. Although they could perform them any time during, or even after, the six month window, they were encouraged to complete the activity early while customer care support was readily available. After IAS was live at the agency, no new procurement vehicles were permitted in the legacy systems though modifications were allowed. All new procurement vehicles were created using IAS. After six months, the legacy systems were shut down completely.

Technical Issues

USDA recommends frequent tracking of network usage since a major COTS/ERP solution utilizes a high level of resources. Network and system performance testing is needed to understand throughput constraints on the procurement system and the networks on which data travels. USDA further recommends understanding the impacts caused by different transactions (e.g., simplified acquisitions vs. large contracts with attachments) and planning for the volume at the upper ranges. Peak periods of use should be anticipated and planned for prior to their occurrence. USDA recommends investing in dedicated DBAs and network engineers to manage the technical infrastructure.

USDA also notes that OCI issue ownership is sometimes hard to pin down between Oracle and PRISM and recommends decoupling the interface to ease correcting issues. USDA has made less than five changes in four years to the IAS MQ Series middleware interface.

Concluding Remarks

USDA believes a key to its success is taking the time to develop a vision, planning extensively to meet the vision, and executing on it. USDA stayed true to its visions with minor deviations and has been very satisfied with the results. Also, USDA notes that not everything will work out perfectly, and implementing agencies should be flexible but firm.

Regarding cost savings and performance improvements, USDA notes that it believes it has seen both but cannot quantify them since they did not baseline cost or performance prior to IAS. However, IAS has allowed USDA to qualitatively improve staff utilization due to higher visibility of workforce activity, achieve higher transparency of its activities due to improved process metrics and file management, and perform

better sourcing events. IAS has also allowed USDA to attain better agency and enterprise-wide reporting data because of the move to a common procurement solution platform.

USDA recommends that agencies implementing contract writing solutions with ERPs focus on change management and reporting as these are two areas that the software applications by themselves either do not support as part of the implementation or only provide tools.

U.S. Department of Energy

Interview attendees included Doug Baptiste, DOE; Lisa Romney, DPAP; and Saul Goldberg, IBM. Background information on STRIPES and the iManage program was gleaned from the iManage website, which can be found at: http://www.cfo.doe.gov/corpsyst/i-manage/aboutBackground.htm#Program.

Program/Project History

The Department of Energy (DOE) was established in June 1977 by assembling multiple organizations such as the Federal Energy Administration, Energy Research and Development Administration, Nuclear Regulatory Commission, and Energy Resources Council from a dozen departments and agencies into a single enterprise. The Department was structured to allow for continuity of programs and functions under predecessor organizations while blending their expertise into new management teams. DOE began as a geographically dispersed organizational structure with a diverse set of operations supporting a wide range of program missions. It remains highly decentralized organizationally.

In FY2000, DOE began an effort to centralize certain business operations and remove some of the autonomy and empowerment that kept the Department fragmented. The resultant Integrated Management Navigation System (iManage) Program is the Department's solution for managing enterprise-wide systems initiatives to achieve improved financial and business efficiencies, integrated budget and performance, and expanded electronic government in support of the President's Management Agenda. The iManage Program is a collaborative Departmental effort to define and provide a modern, integrated corporate business system for the Department of Energy.

The iManage Program is comprised of seven major Department of Energy Corporate Business Systems Initiatives that are either under development or have been deployed and are operational systems. These systems are enterprise-wide servicing various DOE user communities providing information in the areas of Finance, Business and Human Resources. The iManage Project Portfolio contains information on: the Standard Accounting and Reporting System (STARS), iManage Data Warehouse (IDW), Standard Budget System (SBS), Corporate Human Resource Information System (CHRIS), Strategic Integrated Procurement Enterprise System (STRIPES), and the E-Travel System (eTS).

The goal for STRIPES is to replace and consolidate approximately 30 procurement systems with a single, enterprise-wide procurement solution. The vision includes replacing 31 interfaces to multiple legacy financial management systems with a single interface to a single Oracle instance implemented under STARS. The STRIPES vision includes interfaces to the IAE environment and calls for improving the efficiency and effectiveness of awarding and administering acquisition and financial assistance instruments, improving the ability of all program offices to perform DOE missions, and utilize existing enterprise financial management functionality to accomplish an integrated solution.

DOE assembled a team from across the procurement community and affected stakeholders (e.g., program office managers) to define solution requirements and conduct market research. The team examined multiple options, including solutions from Oracle, SAP, PAI, CACI, AMS and Compusearch. The team focused on the ability of the proposed solutions to provide the desired results, rather than how they would be supported or accomplished. The team was empowered to create a position that reflected the needs of the intended user community of 450 procurement professionals and 5,000 program office users and execute on it.

In 2003, the team chose to pursue a best in class model. After examining Oracle's solution, the team determined that it was not conducive to Federal procurement requirements in functionality and

terminology, and would require a significant number of extensive changes. Given the scope of the changes and time over which they would need to be made, the team determined that a single solution with the financial management domain was not feasible. The team turned to existing COTS procurement solutions and looked for solutions that supported the Federal procurement industry. DOE was unwilling to accept promises of future functionality, vaporware, or solutions that required DOE contracting professionals to design software. DOE also wanted a solution that would meet all of its major base functionality requirements, rather than a solution that performed some functions expertly (i.e., meet all end-to-end horizontal requirements vs. some deep vertical requirements). To that end, the team conducted an open market competition with live test demonstrations to make selection from a set of acceptable proven solutions. Compusearch PRISM was selected as the solution in October 2006. STRIPES was initially deployed in April 2008 to the headquarters users. During May 2008, three other DOE contracting activities were trained and started using the system. The wave approach will be employed until all contracting activities are on STRIPES. Some contracting activities will not be implemented until FY2009 to avoid 4th quarter deployments.

Program and Project Management

The STRIPES project is managed by a cross-section of representatives from the CAO, CFO, CIO, program offices, and supporting vendors (application providers and system integrators). A formal governance model is in place to keep the project on track and make decisions. DOE cited the governance model as a key success factor.

DOE recommends that the project manager be the right person for the job. Their perception is that the PM should be able to handle a project of the complexity of an integrated software environment, regardless of whether the person is a certified PMP. DOE provided a profile of someone who is both a visionary but also tactical, thick skinned, and tenacious.

Software Functionality

DOE stated that the STRIPES software meets most of its needs. STRIPES supports FAR-based procurement transactions (e.g., letter contracts, definitive contracts, IDIQs including post-award orders, BPAs, simplified acquisitions), purchase cards, some inter-agency agreements, and financial assistance (i.e., grants) transactions. Approximately 90% of the DOE procurement spend is on a small number of extremely high dollar value contracts. Highlighted software functionality related topics are as follows:

- DOE awards most types of common procurement vehicles and feels that the STRIPES functionality meets their procurement support needs with no major functionality gaps. The DOE view, however, is that if STRIPES allows the user to accomplish their work, even if not in the most efficient or expedient manner, then the software has met DOE needs. This is in line with the approach to satisfactorily cover all phases of the end-to-end processes with less regard to deep vertical support in some phases. Some functions are met but would be rated low in the way it is met (e.g., 2 on a scale of 10), while other functions are more highly rated. DOE recommends ensuring that the core functionality be met at the higher levels of satisfaction through demonstrations and formal evaluations prior to selection.
- DOE compared their business processes to the software capabilities to determine gaps in functionality. Gap mitigations were developed including process changes and work arounds, rather than COTS software modifications to meet DOE requirements. Where possible, DOE removed non-value added process actions. Further, DOE made extensive use of the system configurations, especially when considering the integration to STARS, as the Oracle application was the more rigid of the two. As noted elsewhere, DOE elected to implement software that met its basic needs and chose not to develop software capabilities.
- Homegrown and shadow systems are not permitted to support sub-optimally supported functionality. Users are allowed to keep separate records using MS Office applications, but STRIPES is the official repository for all procurement actions and its use to the maximum extent possible is highly encouraged.
- Due to a limitation imposed by the Oracle financial management system, which only handles accounting lines, STARS does not mirror the line items as structured in STRIPES. Specifically, when documents in STRIPES are structured to the CLIN and sub-CLIN level, with one or more funding line on each CLIN or sub-CLIN, the corresponding STARS record only includes the

funding lines. This often causes traceability issues since the STARS record does not identify from which CLIN or subCLIN the funding is associated. The issue is managed as best as possible via the STARS and STRIPES interface where data is transmitted between the systems based on what the target system can accommodate.

- Accountants are capable of modifying the financial management record directly in STARS, rather than follow the procurement process using the STRIPES-STARS interface. This practice is a remnant of financial management practices prior to an integration solution. DOE recommends that the financial community be included in the business process redesign for procurement. Where possible, financial system users should be restricted in the financial management solution from modifying records transmitted to/from the procurement solution.
- DOE established T&C templates to match the DOE procurement instrument types. Users select the appropriate template and tailor the contents by adding/deleting FAR and DOE T&Cs, and modifying T&C contents. The user then generates the selected T&C functionality into a coherent document. The use of T&C templates is generally required by the DOE. However, if users make changes to the online T&Cs and then regenerate to include the changes in the word processing document, they lose all formatting in previously generated and formatted word processing document. This is because the newly generated T&C word processing document overwrites the previous word processing document. DOE is unable to predict whether users will complete all of their work in STRIPES or build T&Cs outside of STRIPES and attach them to the online documents as has been done at other Departments.
- DOE noted that they used the opportunity to consolidate special/local clauses into corporate clauses and standardized them across the Department.
- A few enhancements were developed to meet specific business requirements, but most focus on the interfaces between STRIPES and STARS rather than the systems themselves. Other enhancements include data capture for FAADS reporting on grants awards. Some additional enhancements are desired, but DOE will not pay for them unless they are baselined and partially funded by other clients or the application provider.
- DOE is satisfied with the standard reports in most cases, but is looking at implementing a data warehouse using Oracle Business Intelligence to supplement the PRISM reporting functionality. Other data mining options are being considered. DOE strongly recommends that other departments undertaking a similar effort consider their reporting needs very early in the evaluation and implementation stages of the project life-cycle. If the procurement application does not meet those needs, other options should be implemented with the procurement solution and available from the day the procurement system goes live.
- DOE is using the PRISM FedConnect module to exchange data with vendors. FedConnect is a vendor portal that allows for data and communication exchanges between PRISM implemented agencies and vendors (e.g., posting of procurement documents from PRISM such as solicitations and awards and receipt of data from vendors such as bids and offers) and is purchased on a subscription basis, rather than a license. FedConnect includes suppliers and agencies. Usage of FedConnect has not yielded enough data for DOE to state whether it provides significant process improvements.
- DOE noted that release and support schedules are not always conducive to DOE's needs. DOE is using a 5.x release version, but that is being de-supported, even though DOE has the largest client base of PRISM.

Change Management

Because DOE was formed from multiple entities into a consolidated enterprise, local cultures were strongly ingrained in the 'legacy' organizations. To provide opportunities for inclusion and build a cohesive team, DOE included representation from each stakeholder organization (procurement and non-procurement) as part of the implementation team. The inclusion provided all affected parties an opportunity to express their requirements and concerns and shape the STRIPES program for success. All participants shared in crafting the standard process and configurations and are equally accountable.

To facilitate the transition to STRIPES, DOE listened closely to the various stakeholder organizations and crafted messages that resonated with each organization. A change management team was created which identified change agents tasked with distributing targeted communications to all levels of the organization.

Senior management support was solicited to create the right environment; specifically one that allows changes to proceed without encumbrance. The top-down messaging from senior managers set the tone that STRIPES is critical to the DOE procurement community and is part of the mission critical iManage initiative. Targeted meetings and messages were employed to impart these and other messages to affected employees.

DOE recommends that other departments executing a similar project leverage senior management support to remove roadblocks to the project's success. Also, the project should be depicted in the context of the wider benefits to the department, not just procurement-centric benefits. This allows the department to make decisions and trade-offs that may not be popular with the procurement office or with other domains (e.g., financial management). It's also acceptable to let employees know that resource constraints are a reality and will require the department to do what it can with the resources at hand.

DOE utilizes classroom instructor led training for the procurement professionals and some program office staff. Computer Based Training modules (online training) are used to train requesters, although classroom training is available to the program offices if they are willing to pay for it. Some informal DOE internal training will be available to defray costs.

The Department recommends scheduling training with contingencies for the project schedule and user schedules.

Testing

DOE performed extensive selection testing, both scripted and unscripted, during the evaluation stage and recommends other Departments do the same.

DOE employs a functional testing approach using three rounds of system testing (unit, system, and user acceptance) and functional and technical readiness reviews to make go/no-go decisions on new releases. Testing is customer driven and includes participation from across the end user base to ensure system configurations met business process needs.

Data Migration/Conversion

DOE did not perform data migration of any historical records. The decision was based on the need to make tradeoffs between tasks given project funding levels and degree of difficulty of supporting automated migrations from 30 or more legacy systems. In most instances, these legacy systems did not support the entire procurement process, but focused on specific aspects of the procurement lifecycle such as tracking deliverables, tracking work load, drafting the solicitation or contract, etc. Users were trained on manually reconstructing procurement files and given leeway to determine which records to enter into STRIPES. The project set some parameters for which actions should be or should not be reconstructed mostly based on the remaining length of time a procurement action had until end of the immediate period of performance and/or contract completion.

Technical Issues

None noted.

Concluding Remarks

DOE concluded that funding and people resources constituted its largest challenges. DOE recommends that an agency performing a similar activity make a judicious effort to wisely expend these resources, make reasonable trade-offs, and properly plan a critical path for the functionality to be implemented. A governance structure involving stakeholders across at least the Procurement and Financial Management domains should be established to coordinate the approach to the satisfaction of both parties. In DOE's case, the umbrella iManage initiative provided the infrastructure to support this recommended model and proved valuable to the STRIPES success.

Defense Logistics Agency

Interview attendees included Claudia “Scotti” Knott, Joseph Ryder, John Simpson, Annette Kennedy, Lora Conrad, Robert Gee, Jeff Curtis, and Ynette Shelkin, DLA; Lisa Romney and LeAntha Sumpter, DPAP; Saul Goldberg, IBM.

Program/Project History

The Defense Logistics Agency (DLA) is DOD's largest combat support agency, providing worldwide logistics support in both peacetime and wartime to the military services as well as several civilian agencies and foreign countries. DLA supplies almost every consumable item America's military services need to operate, from groceries to jet fuel and helps dispose of materiel and equipment that is no longer needed.

DLA operates a streamlined supply depot and distribution system, is focused on moving DLA support far forward to the point of military customers' demand and managing suppliers, not just supplies. Enterprise Business Systems, updated and integrated supply chain, and financial management processes and systems making DLA support to the warfighter faster and more efficient. DLA manages 5.2 million items, processes 54,000 requisitions per day, and issues 8,200 contract actions per day.

DLA migrated from a Government Off the Shelf (GOTS) procurement application to Procurement Desktop-Defense (PD2) under the Standard Procurement System (SPS) initiative. SPS was integrated with the SAP financial management solution and the Manugistics logistics management solution. The concept demonstration revealed several major functionality gaps with the SPS solution: lack of automated buys, insufficient support for delivery order processing, poor post award processes, poor workload management capability, and insufficient electronic contract file management. Companion applications such as SRWeb were developed but did not meet requirements. Next Generation PD2 was also explored and found lacking. DLA dropped SPS and reverted back to operations under the legacy GOTS application which is currently the contract writing solution.

In response to the inability to deploy SPS, DLA began a development partnership with SAP to create a new module in SAP’s ERP suite that would meet the specific needs of DLA and the general requirements of the Defense procurement profession. The resultant module incorporated into SAP is Procurement for Public Sector (PPS). The initial release in September 2005 focused on sourcing against existing awards and other basic functions while the second release in Spring 2006 addressed issues and augmented the functionality from the first release.

During this time, DLA continued using their legacy GOTS application interfaced with the SAP financial management software. In the Summer 2008, DLA will receive a ‘sandlot’ version of PPS 2.0 to test whether it meets the DLA business processes and stated requirements. In October 2008 DLA will begin work on upgrading its SAP financial management application with a July 2009 target for moving into production. This is a pre-requisite for SAP’s ERP to be compatible with PPS 3.0

The development partnership between DLA and SAP continues today with plans for adding in required functionality, including support for BRAC depot level reparables awards and retail support to all services. DLA anticipates migrating to SAP PPS as early as FY2010 with full cut over by FY 2012. DLA anticipates a phased approach to deployment but has not ruled out other options (e.g., big bang). To date, DLA has invested $24M into the SAP partnership for licenses and development activities.

Program and Project Management

DLA established a PMO office for its Business System Modernization (BSM) which has oversight of all information technology activities, including the SAP development effort.

An executive board meets bi-weekly with every affected SES to discuss process and technology issues. The board operates under a philosophy of compromise, bonding, and continuity (a requirement to be on

the board). DLA notes the executive board has been the project 'saving grace' for solving issues, making decisions, and keeping the ERP implementation on track.

DLA notes that 80% of the ERP solution is fielded. Some aspects of the implementation do not meet full requirements or expectations, but DLA stated that they chose not to wait for perfection during the deployment.

Software Functionality

DLA is essentially partnering with SAP to obtain a 'custom' application that supports DLA's unique requirements but is really a COTS application. When completed, SAP PPS in intended to meet all the core requirement of Federal procurement, including the Defense procurement requirements and the DLA unique requirements. Software functionality highlights provided during the interview are included below.

- DLA processes approximately 36,000 orders a month. Approximately 80% of all DLA transactions are fully automated from requisition receipt through delivery or purchase order award and transmission to vendors. Practically no human intervention occurs. The volume drives the need for automated processing which is why SPS was dropped in favor of the legacy system and spurred the investment decision.
- DLA noted that their initial assessment of SAP 4.0 revealed bare boned functionality with significant gaps. Specifically, these included:
    - Inability to support CLIN structures, including sub-CLINs
    - No terms and conditions functionality
    - Limited RFx and sourcing support
    - No standard and optional procurement forms for DoD or Federal Civilian
    - Functionality was developed towards supporting business relationships rather than competed activities
    - Insufficient delivery order processing requiring significant extensions
    - Lacking support for order fulfillment from existing stock and delivery order and purchase order processing
- DLA estimated that SAP 4.0 also lacked many basic features common in other COTS applications that focused on federal procurement.
- DLA's decision to invest in SAP was based on DLA's desire to perform as much business as possible within the ERP application.

Change Management

Extensive briefings were delivered to the executive and line levels. Change management activity was attempted at the lower levels but abandoned to the corporate level.

To support the ERP, 250 positions were created. Staff was hand selected, trained, rewarded, and empowered to deliver the solution.

Training on the new ERP was mostly instructor-led classroom sessions. DLA stated that an agency undertaking a similar venture should not shortchange training users in this area. Training should not only focus on standing up the solution, but also on new features/functions and follow-on refresher training. DLA lessons learned here are that the quality of training directly impacts the success of the implementations and the capacity to train directly affects the rollout strategy.

Testing

The only note on testing during the interview was to ensure that extensive testing be performed in conformance with SDLC best practices.

Data Migration/Conversion

The approach to data migration to SAP included a design and proof of concept/concept demonstration. All open transactions were converted. Open items that could be closed in the legacy DLA Pre-Award

Contracting System (DPACS) system were closed. Five years of history were brought over. All new items were initiated in SAP. DLA imparted that there were many data cleansing issues.

Open long term contracts were brought over piecemeal. New orders were initiated in the new system while the contracts were left in the legacy systems. DLA admits that the approach was not well executed and caused reporting and traceability issues.

Technical Issues

None identified during the interview.

Concluding Remarks

DLA concluded by remarking that they hoped their move to SAP can somehow be leveraged by other agencies and avoid massive integration efforts to other services' legacy applications.

DHS – U.S. Coast Guard

Interview attendees included Rachel Verlik, Immigrations and Customs Enforcement (ICE), formerly the U.S. Coast Guard CIMS Project Manager; Pamela Campbell, DHS Acquisition Systems Branch; Lisa Romney, DPAP; Saul Goldberg, IBM.

The interview was conducted mostly focusing on the Coast Guard experience, which was completed prior to the transfer to the Department of Homeland Security (DHS). The solution is also used by the Transportation Security Administration (TSA). Some information from the interview comes from the DHS, ICE, and TSA experiences.

Program/Project History

Since the Department of Homeland Security (DHS) began operations in March 2003, as mandated by the Homeland Security Act of 2002 it has faced the daunting task of bringing together 22 diverse agencies. DHS has initiated various approaches as it attempts to transform itself into a single entity across strategic vision, information technology, and management systems especially related to financial information, acquisitions, grants, and human capital management. The Department's attempt to reach this goal includes consolidating and standardizing on applications while migrating from diverse legacy systems, many of which utilize antiquated/obsolete technologies, with a mix of COTS and homegrown applications. For the procurement and financial communities, only a few upgrades were in process at the time DHS was formed, but the promise of upgrading business administration systems was largely received as a welcome move.

DHS inherited many financial management weaknesses and vulnerabilities from the 22 agencies. From 5 of the agencies, auditors had identified 30 reportable conditions, 18 of which were considered material internal control weaknesses in fiscal year 2003. To help remedy the situation, DHS began implementation of the electronically Managing Enterprise Resources for Government Effectiveness and Efficiency (eMerge2) program in January 2004 to integrate financial management systems across the entire department and to address the financial management weaknesses. eMerge2 was expected to establish the strategic direction for migration, modernization, and integration of DHS financial, accounting, procurement, personnel, asset management, and travel systems, processes, and policies. The eMerge2 project was halted in December 2005 due to lack of project direction and confusion on what was to be delivered, missed schedules, inadequate deliverables, and high expenditures with little to show for the effort.

Electing to try an alternative path, DHS officials decided to consolidate under the department's financial management systems. The Office of Management and Budget (OMB) approved DHS's decision to rely on its in-house core financial management operations. DHS officials performed an internal assessment of the financial management systems being used by the components and revisiting internal financial service

providers, such as the Coast Guard, to determine whether they can leverage those resources. The systems used by TSA and CBP were some of the internal DHS systems being considered.

To date, DHS employs multiple instances of Savantage (FFMS) and one instance each of Oracle, SAP, and Momentum for financial management/ERP as DHS Headquarters has elected to not select a single enterprise-wide solution. DHS agencies are enabled as follows:

- Secret Service has an Oracle Instance
- Coast Guard has an Oracle Instance which is shared with TSA
- Customs and Border Protection has an SAP instance
- Federal Law Enforcement Training Center has a Momentum instance
- Federal Emergency Management Administration has an custom IFMIS instance
- Immigrations and Customs Enforcement has a Savantage instance which is shared with DHS HQ and several of the components serviced by ICE

DHS concurrently determined a need to consolidate components on a single enterprise procurement solution to standardize technical platforms, reduce investment costs, and improve data capture capability across DHS. The DHS procurement solution, the Enterprise PRISM Instance (EPI) is based on Compusearch's PRISM. EPI is financial system neutral. The Coast Guard implemented Compusearch's PRISM application, referred to as the Contract Information Management System (CIMS), prior to joining DHS.

CIMS was interfaced with the legacy Department Accounting Financial Information System (DAFIS) before DAFIS was migrated to Oracle under the DHS financial management solutions approach.

CIMS is integrated to the Coast Guard's Finance and Procurement Desktop (FPD). FPD is the homegrown system for simplified acquisition and field accounting. FPD is integrated with the Coast Guard's Oracle suite referred to as the Core Accounting System or CAS.

Program and Project Management

USCG Headquarters led the CIMS implementation effort. Like many DHS components, the Coast Guard integrated into the implementation by providing resident experts to shape the deployment and develop the solution architecture.

Software Functionality

The Coast Guard procurement solution is comprised of three applications interfaced to a variety of other applications that form the Coast Guard ERP solution, as follows:

- PRISM – The DHS standard procurement solution used for core procurement functions, specifically large complex contracts issued from headquarters such as vessel repair and DEEPWATER. PRISM is integrated with FPDS-NG and other IAE applications. PRISM is deployed under the Contract Information Management System (CIMS) pseudonym. CIMS is interfaced to FPD with a bi-directional feed. PRISM is considered to provide sufficient support for contract writing.
- Financial and Procurement Desktop (FPD) – The homegrown legacy solution that 'resides' between PRISM and Oracle. FPD is the enterprise-wide accounting and procurement system assigned to assist in funds and procurement management. FPD is used for micro-purchases and simplified acquisitions by the field offices and program office users. FPD also allows agencies to perform project budgeting and ledger management. FPD is interfaced with CAS and CIMS with bi-directional feeds.
- Oracle – The core financial management application at the Coast Guard under the Core Accounting System (CAS). Coast Guard's Oracle instance is heavily customized.
- Other systems comprising the ERP include:
    - TEServ travel management solution - Interfaced to FPD and CAS with a one-way feed.
    - Sunflower property management - Interfaced with CAS and FPD with a bi-directional feed.

- Consolidated Billing System (CBS) credit card processing and MarkView Imaging and Workflow - Interfaced to CAS with a one-way feed to electronically process and track field financial transactions and vendor invoices.
- National Finance Center (NFC) payroll - Interfaced to CAS with a one-way feed.

From a high level solution architecture view, workflow is performed as follows.

- Requisitions are initiated in FPD and validated in Oracle against the cited budget. Upon receipt of validation in FPD from Oracle, the requisition is transmitted from FPD to PRISM.
- In PRISM, the requisition is reviewed by the assigned contract specialist and accepted, rejected or suspended. Once accepted the requisition follows the required process for contract placement, contract management (e.g., modification, order processing).
- If a PRISM transaction is processed and obligates funds, the transaction is transmitted to FPD. FPD transmits the action to Oracle where it is matched with the requisition to reduce the cited amount and obligates the funds in Oracle.
- The solution architecture was noted as working "OK" but there are interface issues.
  - The interfaces cause discrepancies, specifically between obligations and payments. Bulk funding is used for large ship repair, and there are partial obligations and payments. The complex nature of these types of contracts causes many of the issues.
  - Many of the policies developed to manage the interface cause the issues.
  - The transitional nature of personnel (i.e. lack of continuity) resulted in a lack of hard decision making during the planning and implementation stages which resulted in soft policies. The issue continues post-deployment.
  - Some of the policies governing the interfaces changed procurement business processes. Oracle was the first system implemented and deployed to address material weaknesses in financial management. All other domains were required to meet the financial management goals and as such were expected to work within the financial management framework. While this has helped address some material weaknesses, and has improved some procurement processes, it has also placed some limitations and burdens on the procurement community.

The lesson learned and recommendations from this experience include:

- Define requirements, processes, and policies holistically. Include all affected business areas and be willing to meet the needs across the areas. Invite the financial management, procurement, accounts payables, property, program office, and other stakeholder communities to the project with willingness to compromise but also make tough choices.
- Develop processes end-to-end and ensure traceability is maintained where needed (e.g., CLINs, contract file contents, document numbers, funds citations, accounting lines).
- Ensure understanding of terminology between the systems and domains by mapping terminologies. "Lines" can be defined as CLINs, accounting lines, PR line item, contract line item, and so on. Define common terminology wherever and whenever possible.
- The accounting structure should be defined and maintained across the enterprise.
- Consider usability and don't short change it. Some Coast Guard personnel were vehemently opposed to retiring FPD because they were accustomed to it, FPD easily met their simple procurement and budget management needs, and a move to a more industrial strength application was not warranted.
- For reports, look at all standard reporting needs as well as public and government requested types of reports. Agencies undergoing a system implementation should critically ask what they need to get out of the system. Consider polling external FOIA and Congressional Affairs Offices representatives for the types of reports they request.

A final note was that the effort to move some functionality into the Oracle ERP is perceived as a big effort, but it isn't perceived as critical either. Because PRISM is the mandated procurement system, it is unlikely core procurement functionality will move to an ERP, though requisition origination may move to the ERP from FPD someday.

Change Management

Basic change management techniques were used to educate staff and bring them into the CIMS fold. Senior management was leveraged to facilitate the project and key staff was placed on the implementation team. Targeted messaging was developed and delivered to appropriate individuals. Stakeholders were included from across the enterprise to address all concerns. As stated previously, the Oracle implementation provided lessons learned about taking a holistic view and being amendable to others' needs. These recommendations apply to the change management effort as well.

The Coast Guard established a standard Tier 1, 2, and 3 help desk with each tier branching into specialties. ICE has a centralized help desk. A DHS Headquarters managed help desk is contemplated for all components in FY 2010.

Two change management recommendations were made:

- Local administration (i.e., power users) should be the first line of support. These would be system users in the office/on the floor with other users that best understand the solution architecture, application functionality, business process, etc. This would allow other users to ask questions and see the resolution on screen like tutorial training. It would also allow the agency to uncover and address business processing and policy issues which is something that a help desk support would not likely be attuned.
- Don't underestimate the importance of change management.

Testing

As stated previously, USCG's Oracle instance is heavily customized. This makes it harder to upgrade to new releases and requires Coast Guard to maintain a custom interface. With this arrangement comes a need to conduct a significant amount of development and unit, system, and regression testing.

Data Migration/Conversion

None identified during the interview for the Coast Guard. It was noted that ICE performed a manual migration using the PRISM reconstruction functionality for their EPI implementation. ICE employed a common cut off approach to determine candidate contracts for reconstruction based on open status, remaining contract life-cycle length, go-live dates, and ability to close out contracts in the legacy system.

Technical Issues

None identified during the interview.

Concluding Remarks

No additional insights beyond those identified above.

DHS – Customs and Border Protection

Interview attendees included Andrea Wood and Steven Smith, CBP; Pamela Campbell, DHS Acquisition Solutions Branch; Saul Goldberg, IBM.

The focus of this report is on US Customs and Border Protection (CBP) lessons learned from implementing SAP R/3 and SAP's contract writing system Intelligent Procurement (IPRO).

Program/Project History

Through 1995, the Custom and Border Protection (CBP) contract writing and ERP experience included several systems with automated interfaces between procurement and the FFS-based financial management system called AIMES.

Early in 1995, the CBP Office of Finance (which includes the Procurement Directorate) conducted business area analyses in some functional areas, as prescribed in the Customs administration Information Strategy Plan (ISP). The results include incremental improvements in functional areas but conclude substantial reengineering opportunities are not achievable due to lack of technological tools. CBP determines that a technology solution was required to implement cost effective, scalable, streamlined business processes.

In July 1997, the Office of Finance chartered a process improvement and financial system modernization project known as the quality planning for asset management (QPAM) project with the objective of reengineering processes to reduce costs while enhancing service. CBP creates a task force staffed with representatives from the financial management, procurement, budget, and property management communities. The task force spent several years examining end-to-end processes and developing system requirements, business process models, IT requirements, and other parameters for the solution. The results determine that reengineered processes can only be achieved with the implementation of effective, useful, and advanced technology. The task force recommended the implementation of an enterprise resource planning (ERP) software.

In September 1999, CBP selected SAP R/3 as the ERP solution with the SAP IPRO application as the contract writing system. IPRO, which SAP acquired from the Procurement Automation Institute (PAI) in 2000, is an automated system used to generate solicitation and contract documents. IPRO delivers advanced client-specific software tools that support an organization's procurement policies and procedures. IPRO provided core procurement contract writing functionality that the SAP R/3 software could not.

In June 2000, the SAP pilot project is completed. CBP determined that the software configured demonstrated key processes and the team recommends proceeding to implementation planning. CBP conducted gap analyses and gap mitigations to address process and functionality issues.

In October 2000, the SAP Implementation Planning effort is completed. CBP selects a phased roll-out strategy for the SAP Implementation consisting of three releases.

Release 1: Replacement of Logistics databases
Release 2: Replacement of PIMS/VIMS, CLAS, ARRS and PRO-DOC/TRAC for contract writing
Release 3: Replacement of FFS, RMS and Budget Execution

CBP completed the Business Blueprint and Early Development phase in March 2001 for Release 1 and Release 2. During Early Development, a select sampling of fourteen development objects (e.g., reports, interfaces, conversions and enhancements) were delivered by the Business Process and Development Teams. Due to funding limitations, the start of Release 2 was deferred and the project moved forward with the implementation of a re-evaluated scope for Release 1 only In April 2002, CBP went live with functionality based on the scope definition from the Blueprint phase for all Release 1 business solutions in Real Estate, Project Systems and Plant Maintenance – Real Property.

From June 2002 to October 2003, CBP completed the implementation of Release 2, which covered core SAP R/3 functionality in Procurement, Property and Finance. Part of the Release 2 requirements included the integration between core SAP R/3 and IPRO and the configuration of the SAP General Ledger to support the ACE implementation of the Accounts Receivable Subsidiary ledger. The legacy CBP systems replaced in Release 2 included Property Information Management System (PIMS), Vehicle Information Management System (VIMS), Customs Logistic Automated System (CLAS), Automated Receiving Report System (ARRS) and Procurement Documentation Tracking (PRO-DOC/TRAC) legacy systems. Release 2 also captures cost management data from various legacy systems for use by the Cost Management Information System (CMIS).

Regarding the IPRO implementation:

- All IPRO project phases and major milestones occur with the SAP Release 2 implementation.
- IPRO went live concurrently with the SAP Release 2 implementation to 100 users.

- SAP developed the IPRO configuration, security, end-user training (development and delivery), and interfaces between SAP and IPRO.
- The core Release 2 SAP procurement team assisted the IPRO team with the business requirements (business processes and interfaces).
- SAP/IPRO team provided installation support and continued technical support for the IPRO software.
- SAP provided technical administrative/maintenance training to Core Release 2 SAP basis team members.
- The IPRO team followed the SAP Project methodology and used the AscendantSAP Toolset.
- The IPRO team provided the procurement team with a weekly status report.
- The IPRO team participated in the weekly Procurement Team status meetings.

Release 3, which upgrades SAP R/3 4.7 Enterprise 1.10 to 4.7 Enterprise 2.0 and an EAPS upgrade from 1.1 to 2.0, is implemented by CBP in October 2004 and replaces the Federal Financial System (FFS), Report Management System (RMS) and Budget Execution (BE) systems. Implementation of SAP functionality covers all Core Finance and Budget processes. Release 3 introduces SAP's Business Information Warehouse (BW) to support CBP reporting requirements.

CBP SAP versions implemented and timing overview:

- Release 1 – SAP R/3 4.7 Enterprise 1.10 EAPS 1.1 (April 8, 2002)
- Release 2 – IPRO 2.44 (October 8, 2003)
- Release 3 – SAP R/3 4.7 Enterprise 2.0 EAPS 2.0 (October 12, 2004)
- Upgrade IPRO 2.44 to IPRO 2.46 (January 18, 2007)
- Technical upgrade of SAP R/3 4.7 Enterprise EAPS 2.0 to SAP R/3 ECC 6.0 (May 27, 2008)
- Technical Upgrade of IPRO 2.46 to SAP Procurement for Public Sector Release 3 (April 1, 2009)

SAP has incorporated the functionality of IPRO 2.46 into its Procurement for Public Sector (PPS) solution. CBP intends to upgrade IPRO in order to remain current with SAP development and support. PPS Release 3 which will be tied to SRM 7.0 is scheduled for release to ramp up customers in November 2008. CBP's upgrade to PPS will be a technical upgrade meaning that no new functionality is implemented at the time of upgrade. Once the technical upgrade is completed, discussions will be held with the Procurement Directorate to determine the additional functional requirements that are available in PPS and required by the Procurement Directorate.

Currently there are approximately 150 IPRO users and approximately 4,000 SAP users.

Program and Project Management

CBP's ERP implementation management approach is documented in a project charter. The program is headed by an executive steering committee of senior executives. Project directors provide next level down management oversight. Smaller teams focus on individual domains (e.g., procurement, property, core financial management, change management, system development) as either subject matter exerts or system implementation and integration experts. External advisors from CBP and support contractors are available to support the implementation. The project management team manages the project scope which is defined in a project charter. Team leads track their tasks, work products, issues, and change requests and are held accountable for providing desired results. Roles and responsibilities are defined in the project charter.

Communications within the program and project management infrastructure are formalized. A variety of project planning, milestone, and status reports are used to track progress and report to various project management levels. Other reports are used to track ongoing progress and issues. Formal weekly status meetings and reporting forums are used to report between individual teams and the executive steering levels.

Software Functionality

CBP stated that the IPRO and SAP R/3 software meets most of its Procurement requirements. IPRO supports FAR-based procurement transactions (e.g., solicitations, definitive contracts, IDIQs including post-award orders, BPAs, simplified acquisitions), milestone tracking, and other standard core procurement functions. SAP R/3 supports other acquisition functions (e.g., requisitions, approvals, etc.). Highlighted software functionality related topics are as follows:

- CBP's late 1990's assessment of most procurement COTS applications, including ERPs such as SAP and Oracle, was that they were all weak in contract administration. Additionally, they assessed the applications as providing the program offices poor milestones visibility and contract/award status. CBP feels that its electronic business opportunities are currently lacking, specifically electronic signature and electronic records. CBP believes SAP will improve these areas over CBP's current situation in PPS Releases 2 and 3.
- The initial IPRO deployment included the following key capabilities
    - Business Process Definitions - IPRO processes covering all IPRO relevant SAP processes
    - Interface SAP to IPRO - Covers all IPRO relevant SAP processes
    - Data Conversion - Open contract obligations and selected simplified acquisitions
    - IPRO Reports - SF 281 Federal Procurement Data System Summary, Milestones for Acquisitions, Outstanding Purchase / Delivery Order, Active Procurements Pending Award, List of Orders against BPAs against GSA Schedule Contracts, Admin Database Report, Interagency Database Report
    - Support for twelve procurement forms: TD F 76-06.9 Department of the Treasury TADS Input Form; SF18, Request for Quotation; SF26, Award/Contract: SF30, Amendment of Solicitation / Modification of Contract; SF252, Architect-Engineer Contract; SF1442, Solicitation, Offer and Award (Construction, Alteration or Repair); SF1447, Solicitation / Contract; SF1449, Solicitation / Contract / Order for Commercial Items; CF236, Interagency Agreement; OF347, Order for Supplies or Services (Same as CF341); SF 33, Solicitation, Offer and Award Personal Contracts Award Form; Personal Contracts Award Form
- CBP continuously improves its processes through new and improved software functionalities. For example, CBP upgraded IPRO to version 2.46 in order to implement FPDS-NG interface functionality. In addition, development is being completed in R/3 to implement integration with FedBid and a deobligation request process was implemented for FY 2008. In the past two months, no new Procurement functionality has been implemented into SAP or IPRO due to the work being performed for the technical system upgrades.
- Requisitions originate in SAP. Requisitions are approved and assigned to buyers in SAP, and then sent to IPRO for processing. Awards are transmitted back to SAP where the funds obligation occurs. If funds are not available for obligation, a real time error message is sent to the Contracting Officer in IPRO and the award is not issued. Emails are employed to notify affected users when certain system actions occur (e.g., Requisitions assigned or modified).
- FAC updates are made manually in IPRO through a promoted to production pipeline. IPRO employs a knowledge-based method.
- CBP uses SAP R/3 to obtain procurement reports due to a combination of IPRO not providing sufficient reporting capabilities and SAP's superior reporting capability with its built in Business Warehouse (soon to be Business Intelligence) module. Fields were added to SAP to receive procurement specific data from IPRO for reporting. CBP notes that SAP is the system of record for procurement transactions from a financials point of view. The contract file is managed in IPRO but the official contract record is the paper file. Most of CBP's reporting is conducted using financial data as the reporting key.
- Limited electronic receiving functionality for Logistics Reimbursable Work Authorizations (RWAs) is being piloted.
- CBP is moving from IPRO to PPS to remain current with SAP development and support. Improved functionality is anticipated from the technical upgrade. For example, using SAP security, CBP can allow a requisitioner to view a solicitation on-line as well as the pre-award milestones.

- Through various SAP developed user groups (e.g., ASUG), CBP has submitted public sector procurement requirements to SAP and many of those requirements have been included in the development of PPS. SAP also completed a project with the Defense Logistics Agency (DLA) in order to identify public sector procurement requirements and include those requirements in PPS.

Change Management

Based on prior experience, CBP offer the following recommendations:

- Develop several media, targeted messaging, and appropriate frequency for specific stakeholders. Executive level messaging may be done infrequently using briefings. Staff level end users may require frequent newsletters, FAQs, and participation in implementation activities such as process design and user acceptance testing.
- Get mid-level managers and end users involved. Mid-level managers need to translate the big picture for their staffs. End users know the business processes and their needs the best. Involving these constituencies will improve adoption of the new system.
- Create power/super users from the end user base that are co-located with their operating divisions.
- Senior executives get involved but don't always push down the messages. Also, they are not the daily users. While senior executives can articulate the strategic visions and strategic need, only the mid-level managers and end users craft the true solution.
- Devote the time, effort, and money to training. CBP developed classroom training materials, computer-based-training (CBT) materials and webinars for new functionality demonstrations and instruction. IPRO training was delivered as instructor-led classroom training. Since then, CBP experts have been delivering formal training to new staff. CBP user desk guides are CBP-specific, rather than COTS generic to impart processes and policies where applicable. CBP recommends advanced training to reinforce prior training, address new functions, and demonstrate how other users can better leverage the solution.
- CBP employs a matrixed implementation team. For the change management team to succeed, it is imperative for the business process modeling team and the training team to work with the change management team.
- CBP recommends accepting the ERP and/or bolt-on procurement software for what it is and not customize. Customization is often costly and creates the expectation on the end user that anything and everything can be added in. Often the gaps can be mitigated through process changes and other solutions.

Current SAP and IRPO help desk support includes Level 1 support available via a central help desk. If required, calls are transferred to Level 2 support that consists of project team members. The SAP and IPRO project team members can also receive initial direct calls from Contracting Officers and other users. Contractor support is used for SAP R/3 and IPRO tickets. If required, Level 3 support is available from an organization's subject matter experts.

Testing

Testing is accomplished using standard SDLC methods (e.g., unit, business scenario, integration, systems, user acceptance, security, volume and stress, and regression testing). CBP recommends a thorough and tremendous test effort. CBP uses a four or five week test cycle with each new release, service pack, or patch. Tests should include mock cutovers with detailed schedules; CBP cut over schedules are down to the hour for some activities including the actual cutover. CBP recommends using an automated tracking tool for testing issues; CBP uses SAP Solution Manager to track testing status.

Data Migration/Conversion

The initial data migration/conversion to IPRO included open contract obligations and selected simplified acquisitions from its legacy system. For the technical upgrade from IPRO to PPS, CBP is still determining the strategy that will be used to convert data from IPRO.

Technical Issues

None identified during the interview.

Concluding Remarks

An overall lesson learned not previously mentioned is that the project team members and end users should know about the procurement, financial management, asset management, and other companion domains to best enable the end-to-end processes and policies needed to successfully deploy an ERP. Specifically, procurement professionals using the ERP should have access to check obligations, payments, budgets, etc. and be trained on how to interpret the data in the ERP. To this end, CBP recommends exchanging experts from each domain in a cross-training program to ensure knowledge transfer. Alternately, users that possess the cross-training acquired elsewhere (e.g., career changes) should be considered for the project team.

Also, CBP recommends ensuring easy access to experts and allowing the experts to participate by making participation part of the workload.

CBP recommends remaining current with ERP/COTS releases to avoid prolonged and complicated upgrades which would include upgrades to several releases at once.

Other critical success factors identified by CBP include:

- Staff and other resources that will be needed for the implementation are clearly defined and available
- Software modules, functionality and deliverables to be included in the implementation are clearly defined
- Appropriate support must be provided by business partners (external vendors and contractors), in support of the acquisition and maintenance of hardware and software required for implementation
- Support and commitment from not only the highest levels of management and stakeholders but also the mid level managers.
- Appropriate level of project documentation is maintained throughout the project
- High percentage of business needs are met
- Well-defined security with ease of setup, change and removal of users' rights
- Well-trained users who receive the necessary training to perform their job functions

U.S. Department of the Interior

Interview attendees included Debra Sonderman, DOI; Lisa Romney; DPAP; Saul Goldberg, IBM.

Program/Project History

In 1994, DOI began planning and executing a migration from their legacy SACONS contract writing solution to the new Interior Department Electronic Acquisition System (IDEAS). IDEAS intended to modernize DOI's procurement community by taking advantage of new technologies to improve internal contract writing capabilities and expand data exchange with suppliers. DOS-based SACONS had been implemented in 90 locations across several bureaus for several years but the technology was obsolete and the application was identified as having usability issues (e.g., cumbersome navigations). Additionally, general issues with the DOI telecommunications network were impacting accessibility and usability and the interface to the DOI financial management systems could not be effectively accomplished. In 1997, DOI moved to the client-server Windows-based solution Procurement Desktop to improve the interface to the Federal Financial Management (FFS) solution (both applications provided by the same supplier), standardize procurement applications, processes, and reporting across the bureaus, and modernize the IT portfolio. DOI developed and deployed an electronic vendor portal and other internet-based applications to improve the acquisition community's capabilities and support electronic commerce with suppliers under IDEAS-Electronic Commerce (IDEAS-EC).

While the move to IDEAS-EC provided many benefits, many hurdles still existed. Each location where IDEAS-EC was deployed required a separate database instance and a separate interface to one of the 17 FFS instances. Each database instance for procurement and financials maintained separate vendor tables with inconsistent data formats (e.g., vendor names, codes, classifications), as well as other common tables with similar discrepancy issues. The inability to properly report clean and consistent information remained. Further, cost reductions were not realized concerning maintenance of multiple applications and database instances. Additionally, the procurement solutions were not fully integrated with the Department's property management systems.

For the first time in DOI's history in 2003, the Department issued a strategic plan reflecting a unified DOI plan rather than a bundle of assorted office and bureau plans. The implementation of the Financial and Business Management System (FBMS) as a comprehensive approach to improving business functions was envisioned to enable DOI to ensure efficient and careful use of limited resources leading to mission excellence and delivery of the best possible performance. FBMS represents a complete shift from the highly decentralized approach previously maintained by DOI, and will allow the Department to bring fundamental and constructive change to DOI in terms of how it conducts and manages its business. FBMS will allow DOI to realize the benefits of common processes, a common technology platform, integrated real-time data, and improved operational decision-making. In additional, FBMS will eliminate 180 legacy systems, including COTS, GOTS, and shadow applications. The integrated system will eliminate over 90 official DOI and bureau-specific systems, multiple shadow systems, and enable the alignment of a business management system with the DOI's strategy of modernization, integration, accountability, and customer value. Expected benefits include:

- Replacement of unsupported legacy systems with a system with a long life-cycle and upgradeable components
- Improved security and internal controls to help meet compliance requirements from various sources (i.e., OMB A-123)
- A single point of system access that will eliminate redundant administrative tasks and multiple logins
- Creation of consistent shared tools that will operate on a single instance and platform that stabilizes operations and maintenance costs
- Standardization and integration of business processes across DOI (i.e., property will "talk to" accounting) while allowing for minor adjustments that may be required for valid business reasons
- Delivery of better cost and performance information by synchronizing information both at bureau and departmental levels, including improved reconciliation and auditing.
- Improved reporting capabilities across module/components that will reduce the time and effort needed to generate reports

DOI awarded FBMS in January 2004 under a performance based contract. FBMS includes SAP-ERP 2005 for core financials, some acquisitions support, personal property, fleet management, and human resource management; Compusearch PRISM and FedConnect for contract writing, eGrants Plus for financial assistance; SAP Budget Formulation; SAP Business Warehouse (BW) for reporting; SAP Enterprise Portal; Maximo for inventory management; multiple support systems for help desk and system management; multiple integrations to DOI department systems, bureau/mission specific systems; and multiple integrations to government standard systems (e.g., CCR, FedBizOpps, GSA systems, Treasury FM systems). FBMS is currently live in several stages at a few bureaus with continuous rollout underway.

Program and Project Management

FBMS was designed, in part, to create a holistic ERP solution for DOI's management and administrative needs. To complete the enterprise view, stakeholders from all levels within the bureaus and all affected business areas were included in the planning and selection stages. DOI continues to manage the FBMS project using the same inclusive approach. Areas highlighted include:

- FBMS is considered co-owned by the business areas.
- The Chief Information Officer (CIO) is the Designated Accreditation Authority (DAA) and manages FBMS.

- The Management Initiatives Team (MIT), which consists of Deputy Bureau Directors, and the Executive Steering Committee, comprised of representatives from each bureau, are guiding the project team.
- The project is managed by the Executive Steering Committee, Department Leadership, Project Leadership, Bureau Leads, as well as Functional, Change Management, Core Financial, eTravel, and Technology Teams. Business area subject matter experts from the business assist the implementation teams.
- FBMS is the most expensive IT project ever undertaken by DOI and is on the OMB high risk list. Consequently, the project is managed at the lowest possible detail level.

Software Functionality

DOI noted that the PRISM contract writing solution is meeting most current procurement needs and the integration with SAP is functioning as expected. PRISM is utilized solely for contract writing and is considered the feeder to SAP. Some highlights concerning FBMS functionalities are listed below:

- Requisitions originate in SAP and are sent to other FBMS applications as appropriate. This is in part to maintain centralized requisitioning and avoid some complexity in the system architecture, as well as for licensing reasons. Requisition numbering uses a standard nomenclature and numbers are generated in SAP with bureau-based coding. Receipt and acceptance is also handled in SAP. DOI is using the Treasury internet payment portal for electronic invoices.
- DOI noted that an SAP limitation caused a change from using header level funding to using line item funding, which proved painful from a business process perspective.
- Overall the system architecture has greatly improved internal controls, though business processes have become somewhat more difficult. DOI believes that the trade-offs are acceptable.
- DOI related that the interface between PRISM and SAP is standard one-way (i.e., provided by the application provider) but custom the other.
- Some enhancements are desired, but they are mostly minor. The significant enhancement mentioned that will improve interface data exchanges and business processing is SAP's handling of decimal positions. Without this enhancement, DOI cannot properly perform commitment accounting.
- CCR is integrated with SAP. When the procurement and grants functions need a vendor not in the PRISM or eGrants Plus applications, a call is made to SAP to transmit the vendor information. This is to maintain an official, single, centralized vendor database.
- Contract writing reporting is completed using both PRISM standard reports and the SAP Business Warehouse. Tactical reporting is done in PRISM for such things as contracts by award date, contracts by type and acquisition workload management while strategic reporting is done in SAP BW.
- DOI recommends leveraging the move to a new ERP solution as an opportunity to truly examine business processes, make improvements, standardize where possible across the enterprise, and address unique process needs. Specifically, DOI noted that internal controls, financial and otherwise, should be examined.
- DOI noted that at the time FBMS was being competed, Oracle was proposed for contract writing. The Department felt that the solution did not meet Federal procurement requirements. DOI has not explored leveraging SAP's Procurement for Public Sector (PPS) module.

Change Management

Organizational change management is performed for FBMS using common techniques. Specifically, DOI noted:

- Change management requires departmental collaboration with the implementation and integration supplier. Deploying agencies must help craft target messaging to stakeholders.
- Change management requires constant attention, especially to bureaus whose deployment may be several years away to keep them involved.
- Communications and training are important and should not be overlooked or under estimated in value.
- DOI employs a centralized help desk for all ERP systems.

- User adoption for PRISM has been fine. During the initial stages of FBMS, project leaders discovered that users were using shadow systems and other non-Departmental tools to manage their work. One organization literally retyped all of the FAR terms and conditions and had been using their local version instead of the terms and conditions provided by IDEAS. Under FBMS, such systems were “outlawed’ and users are required to do all of their work in PRISM.

Testing

Not discussed during the interview

Data Migration/Conversion

DOI’s migration methodology consisted of developing a strategy for what types of data would be migrated followed by an analysis of the detailed data to be migrated and how it would be migrated. Following are highlights provided concerning the migration:

- Legacy system managers and users were apprised of how FBMS would receive data and then provided instructions for data cleanup in anticipation of the migration.
- SAP is very particular in how it captures information. Data disconnect issues arose with data elements common to most systems that needed to be normalized to the SAP standard. For example, a common issue was user names where variations of the name referred to the same person (e.g., asmith, andreasmith, and andreasm).
- DOI noted that changing the funding model from document header level to document line item level was painful from a conversion perspective (e.g., proration of funds, tracking of expenditures against obligations).
- DOI performed an automated conversion from IDEAS to FBMS after closing out transactions in IDEAS using a modification to the contract to change the IDEAS document number to a new FBMS contract number. FPDS reporting proved troublesome since the PIID and historical document numbers were out of sync.
- A lesson learned from FBMS’s initial deployment is to plan for and perform multiple mock conversions to ensure the migration can be performed with a very high degree of confidence. Mock conversions also identify unforeseen issues and allow for corrective actions prior to actual migration.
- Another migration lesson learned was to be flexible with how you approach conversion. DOI related that current values matched against historic values led to an inability to convert documents using a three-way match of obligations, receipts, and invoices. This was due to the way data was entered into multiple legacy systems. To complete the conversion, DOI opted for a two-way match.

Technical Issues

Two technical items were noted. First, DOI recommends testing “to the last mile” to ensure that connectivity, bandwidth, and transmission times are acceptable to the most remote users. Second, DOI has many staff working in remote areas, such as park rangers and fire fighters, where internet access is minimal or non-existent. DOI would like hand-held devices or a similar solution for recording transactions, but has not addressed the issue.

Concluding Remarks

No additional insights beyond those identified above.

Defense Intelligence Agency (DIA)

The DIA discussion was conducted during the development of the ERP Contract Writing Lessons Learned survey to identify content for the survey. It was not a formal interview for the resultant report. However, salient information was provided by DIA during and after the discussion and is documented below. Information from this interview is included in the resultant report.

Attendees included Mark Bogart, Ken Sherwood, Judith Oxman, Karen Blum, and Mike Earnhardt, DIA; Lisa Romney, DPAP; Saul Goldberg, IBM.

Program/Project History

The driving factor in DIA's ERP implementation was the requirement to achieve financial auditability.

Program and Project Management

DIA's deployment approach followed the typical implementation lifecycle at the major task level. The deployment was executed with detailed milestones but one actual deployment/end system.

DIA notes that formal support teams are critical during a new deployment, especially one involving multiple interfacing systems. While there were three qualified support teams for the DIA deployment, one for each interfacing system (Purchase Request Electronic Support System (PRESS), Contract Management System (CMS), and Finance and Accounting System (FACTS)), there could have been better coordination between them. With three interdependent interfacing systems, it would have been beneficial for all support personnel understand the other systems at the basic levels. DIA additionally felt there was room for improved communication between the support teams, which could have been accomplished via meetings/introductions during the pre-deployment timeline and during project execution.

DIA notes that their implementation could have better engaged leadership and the end user community to include all users of the Financial Management System (FMS), as well as all purchase request submitters. This would have let the financial community better understand the more intricate decisions that were made, identify new requirements, and the impact to themselves and their users. Very little guidance was provided to the purchase request preparers, who were totally unprepared for the complexities imposed on the Agency business processes by the FACTS application. Better communications would have gone a long way to refining expectations of the user community and may have helped users view the implementation in a better light.

Software Functionality

DIA is implementing CACI's ComprizonSuite as its core procurement application under the Contract Management System initiative. The CMS is integrated with FMS/FACTS (FACTS), a PeopleSoft Financials-based application hosted at NSA; the agency's Human Resource Management System, eZHR, a PeopleSoft application; the Agency's Integrated Logistics System (ILS); and the agency's Electronic Data Warehouse (EDW). The PRESS application, a legacy system, is being replaced by the ComprizonSuite application. Requisitioning and contracting, to include contract management is accomplished in the CMS which feeds commitment and award data into FACTS. Invoicing and payments are handled by FACTS, whereas all other procurement actions take place in the CMS. FACTS is a financial system that tracks funding from original commitment, to obligation, to invoice and payment.

The COTS ComprizonSuite procurement application allows the procurement user community to operate in accordance with the FAR and DFARS. The agency requirements, derived from the CFO Compliance act, were built into the application as dictated. Changes to the procurement/contracting application were required in order for the ERP FACTS to operate as implemented. This was a case where the financial management system was implemented without regard for procurement and contracting actions and resulted in usage in contradiction with the FAR/DFARs.

The T&Cs as contained in CMS are a complete collection of the FAR and DFARs T&Cs. The procurement application provider receives FAR and DFARs clause updates and consequently sends the updates to the agency for upload. Users must use the T&Cs as they exist in the application, and are only able to complete the specified fill-ins.

The CMS, when full operational capability is achieved, will be a single acquisition and contract management system integrated with the agency's financial management and logistics systems – a single repository of accurate and complete critical contracting data.

All three interfacing systems underwent a major upgrade at the same time, and because each system has a different migration path for legacy data, there was often confusion about how manipulations of the legacy data needed to be handled. Additionally for a successful initial implementation, all three support teams and user communities would have needed to be up to speed on the relevant business rules and process changes. For instance:

- PRs prior to FY08 were not available in the new requisitioning system. In order to perform some actions, a hardcopy PR needed to be created outside of the requisitioning system.
- Modifications executed on legacy contracts could not be interfaced to FACTS. While this was known ahead of time, there was no method for otherwise transmitting the data to FACTS. As a result, the additional requirement for hands-on support and the need to define new business processes resulted in the ERP application not being kept up to date on these contract modifications for a period of 2-3 months. Once an interim solution was developed, the ERP application still experienced a temporary backlog getting up to date.
- Contracting users could no longer structure CLINs as desired. CLIN structuring depended on the structure of the lines received on the PR from the requisitioning system. This led to a situation where the submitter of a requirement had to know how the contracting staff would structure the contract prior to submitting the PR.
- Due to FACTS limitation, once the CLIN quantity had been fulfilled, no further action could occur against that line.
- FACTS now tracks funding at the CLIN level as opposed to the document/header level. As a result, the procurement specialists are no longer afforded the freedom to structure contracts lines as desired, or to move money between them. The utmost importance is now placed on PR preparation in the requisitioning system so that the PR is structured in accordance with how the procurement specialist intends to make the award.
- While some of these issues were known ahead of time by the individual support teams, communications between support teams and proper notification/training to the user communities were insufficient. The communication and training often came after the fact, well into the implementation timeline.
- Deployment was executed only after full functionality was believed to exist. However, that belief failed to take into account the significant change management that needed to occur to help the user community across the agency adapt to the new environment.

CMS was highly customized for DIA with the intent to be in line with the requirements levied against the FACTS application from the CFO Compliance Act. It is many of these new requirements and customizations that frustrate the user community in totality. While some of the frustration is a result of resistance to change, some is also due to the fact that users are unable to perform the same quality work in as an efficient manner as with their legacy applications. However, with tighter controls in place (which eliminated some of the ‘holes’ in the legacy procurement application), the final result (e.g., solicitation, award, order) is often a more reliable product. The procurement application can now be counted on as the central contract repository and the contract in CMS is the same as the contract sent to the vendor.

Post-deployment, the PR preparation process has undergone the most review and revision. New requirements were invoked in FACTS that required additional CMS compliance. Likewise it became exceedingly important for the requisitioning system to adhere to the FACTS rules. Attempting to implement these new processes resulted in a sizeable impact to organization’s execution rates. To this end, much time was devoted by the support teams determining the various processes for all possible workflows/scenarios and the user community attempting to learn while doing. This work did significantly contribute to requirements for replacement of the PRESS application and its future integration into the CMS.

The business process issues were, on occasion, only discovered as they occurred instead of preemptively through more intensive integration testing and involvement of leadership from the user communities. Additionally, as process issues were uncovered, the updates and revisions to the processes should have been broadcast to the user community more quickly instead of waiting to schedule large workshops and town hall meetings. According to DIA, the interim newsletters and emails were not very effective in communicating news and updates to users.

The procurement reporting solution is Business Objects Crystal Reports, which contains about 50 reports requested by the agency; however the solution was not available at the time of deployment. There was a delay in developing the reports, building the host server at the agency, and testing the reports at the agency. The greatest delay seems to have been building the host server at the agency and putting it through the acceptance process. In the interim, the support team and procurement application provider have been developing ad-hoc reporting queries on an as-requested basis. Once the future CMS-EDW interface is completed, the bulk of information and leadership reported from the EDW data and operational reports will be generated from the ComprizonSuite application using Crystal Reports.

Automated CMS workflow includes optional review and approval processes, as well as PR assignment rules. There are customizable notifications sent to the contract specialist at various points of the procurement process. Additionally there are several notifications sent to the COR/COTR and PR creator providing them visibility into major events associated to their PR (e.g., when it is solicited and awarded).

DIA recommends that an agency performing a similar effort consider security level issues such as personnel system access through the integrations and ensure privacy is maintained.

Change Management

DIA noted that while most users affected by the implementation of CMS and FACTS were afforded opportunities to understand the impacts of the upcoming changes, change management was insufficient, in hindsight, for the CMS users. Some stakeholders such as contracting leadership and specialists felt they were not made aware of the impacts of the FACTS implementation in advance. Also, the most qualified people did not seem to be involved in the pre-implementation integration testing efforts. There was often confusion on the correct functionality. DIA noted that terminology disconnects (e.g., “lines” may be viewed as CLINs or accounting lines depending on the user) hampered communications and may have contributed to some project issues.

For both FACTS and CMS there were change management teams that executed the following activities during the pre-implementation timeline:

- Held several town hall meetings to discuss the new systems and what it meant for the users
- Sent out several countdown newsletters helping users ready themselves for the change
- Implemented a few controls in the legacy application to force users into some of the same business processes that would be in place in the new system.

While the information provided was useful, users were not receptive to the information. Many did not attend the town hall meetings, read the newsletters, or provide any response to the Change Management team.

Training for CMS was provider delivered off-the-shelf training three months in advance, two weeks in advance, and one month after implementation. While the training was aimed at teaching contracting professionals how to use the new CMS application and some of the new agency-specific requirements, a full agency-specific training experience could not be delivered since the interfacing PRESS (now scheduled to be replaced by CMS) and FACTS were not included. DIA strongly felt that there is so much interdependence among the three systems such that the training and knowledge required to use the system becomes exponentially more difficult when the systems are fully integrated. Generic COTS training was supplemented with some agency specific information designed to smooth the transition. Users, however, could not get the full experience due to training focus on the procurement system. Given the complexity of the implementation and the significant business rule changes, DIA felt that customized training focusing on the full experience including partner systems would have been more appropriate.

Help desk support is available. There are three separate support teams, one for the ERP application, FACTS, one for the PRESS application and one for the CMS application. For CMS, neither SMEs, power users, nor any other user group are utilized from a support perspective. The CMS support team receives and responds to all questions and issues. DIA contracting professionals feel that due to the integration of these complex systems and the resultant impact on operations among the systems, a centralized Help Desk with operational expertise across the applications would have been a better approach to providing user support. Effective user support in almost all cases requires a total understanding of all functional systems and the underlying business rules. As DIA exploits the “requisition” functionality of the

ComprizonSuite application (DIA's CMS), consideration is being given to a centralized "business system" support structure.

DIA recommends a strong change management approach that includes all stakeholders, even those peripherally affected. Stakeholder involvement allows them to feel responsible for the project's success, shape the solution, and become project champions. Also, DIA notes communications are critical between different implementation teams and to the end users concerning functionality and functionality gaps and limitations. Finally, cross-training between the domains on applications, business processes, and terminologies is essential and should be addressed early in the implementation.

Testing

DIA noted that the solution deployment was executed only after full functionality was believed to exist, which proved incorrect. In retrospect, DIA believes that the integration testing between all three applications in the ERP suite could have been more robust. Many of the common scenarios were not considered and this caused confusion and frustration during implementation. The user groups should have been involved in the integration testing at least from the position of being a focus group to make sure all relevant business cases and processes were considered. All requirements were properly documented and tested by assigned Test Leads.

DIA recommends thorough testing by experts prior to deployment using real-world examples. Testing should cover all intended business processes and be completed with a reasonably long testing cycle using a large enough team to cover business processes several times.

Data Migration/Conversion

None identified during the discussion.

Technical Issues

None identified during the discussion.

Concluding Remarks

DIA concluded that:

- Completion of a thorough business process re-engineering effort to include all functional environments impacted is essential to ERP implementation success.
- A thorough and common understanding of new business rules that will be implemented is essential in order for the ERP applications to operate and users to perform successfully.
- A common understanding by all system users and their management/leadership of the changes in operational processes and procedures is required for the ERP to operate as intended.
- Ensure requirements are fully understood so that contracting functionality is present in the procurement application/ERP module and systems interoperability is seamless.

The major lesson learned has been that preemptive communication, coordination, and involvement of the user community is extremely important. Without a comprehensive understanding of how users perform their work, and effective change management communication, it is difficult to realize a successful implementation at day one.

In addition, the implementation of the financial ERP application at DIA resulted in overly strict controls on upstream systems, such as procurement. Taking a hard look at the necessity of these controls is required to avoid tightening the system to a point where individuals involved in acquisition and contracting have no flexibility in conducting their work. Failing to do so will seriously impede their ability to perform their work (e.g., preparation, processing of purchase requests and contracting).