

What Federal Acquisition Professionals Need to Know About the New IT Landscape

Federal Government IT failures are all too common. Even so called “successes” come with price tags that are too big, timetables that are too long, and architectures that are inflexible. At the root of the problem is a traditional reliance on “waterfall” development and force-fitting commercial off-the-shelf (COTS) applications in an attempt to make them fit government needs. Most of the acquisition and contract writing systems in use throughout the Federal government today were developed with one of these approaches. Widespread user frustration with those systems highlights how neither approach serves the government’s needs well.

New technology exists that allows government agencies to get tailor-made acquisition and contracting writing systems that avoid the limitations of the past. These solutions are also future-proof and affordable. This paper provides Federal acquisition teams with an education on the new technology, as well as guidance to help them update their evaluation and selection processes to include solutions using this technology.

INTRODUCTION

“We are now approaching 7 years since funds were first expended for this system. The total cost on the system is now over \$1 billion. I am personally appalled at the limited capabilities that program has produced relative to that amount of investment.”

- U.S. Air Force Comptroller Jamie Morin speaking in front of the Senate Armed Services readiness and management support subcommittee in April, 2012 about ECSS, a system intended to save billions by streamlining the Air Force’s procurement and supply chain systems. (Morin later described that system as having a “negligible usable capability.”)

I wish this was an isolated incident, but it isn't. Federal government IT failures are all too common. While the biggest ones like the U.S. Air Force system noted above make front page headlines and get senators asking tough questions (not good for anyone's career), other examples abound.

Even systems that are completed and introduced as a success have unacceptable price tags and often hide failures. Case in point is the FBI's recently completed "Sentinel" case management system. The good news about this system is that it allows the FBI to finally ditch paper files. The bad news is that this effort took 12 years and cost over \$600 million, including \$170M and three years wasted on a previous attempt that was scrapped.

As a whole, Federal government IT performance has been poor. Former Federal CIO Vivek Kundra summed it up best in his **25 Point Implementation Plan to Reform Federal Information Technology Management**. *"Despite spending more than \$600 billion on information technology over the past decade, the Federal Government has achieved little of the productivity improvements that private industry has realized from IT. Too often, Federal IT projects run over budget, behind schedule, or fail to deliver promised functionality."*

CAUSE OF FAILURE #1 – WATERFALL DEVELOPMENT

Vivek Kundra's plan highlights one of the primary causes of Federal government IT system failure. He notes, "Many projects use 'grand design' approaches that aim to deliver functionality every few years, rather than breaking projects into more manageable chunks and demanding new functionality every few quarters." The design approach described in his statement is called "waterfall development." Progress is made sequentially with one major step for the whole system (e.g. analysis, design, construction, testing) completed before another begins. Work on each stage is usually done by entirely different groups which can make this style of development a bit like the children's game of telephone. It's almost impossible to avoid big structural mistakes during these handoffs. Waterfall projects often get off to a bad start as the first step usually has users "throwing their requirements over the wall" to the IT development group.

Use of this approach is a primary cause of the Federal government's poor past IT performance. The waterfall development approach is so clearly linked to Federal government IT failure that some agencies have mandated it out of existence in favor of the Agile approach to software development. For example, the 2010 Defense Acquisition Bill sets new rules that the Department of Defense must follow when purchasing information technology systems. These rules state that any new IT systems must be designed so that they include:

- Early and continual involvement of the user;
- Multiple, rapidly executed increments or releases of capability;
- Early, successive prototyping to support an evolutionary approach; and
- A modular, open-systems approach.

The DoD returned to congress a report on how they would take action to follow these requirements. It is clear they are going to adhere to Agile software development practices.

The rest of the government is under a similar Agile directive from the Federal CIO. One of the points in Vivek Kundra's 25-point plan states, "Moving forward, Federal IT programs must be structured to deploy working business functionality in release cycles no longer than 12 months, and, ideally, less than six months, with initial deployment to end users no later than 18 months after the program begins."

CAUSE OF FAILURE #2 – FORCE-FITTING COTS SOLUTIONS

But what about just buying commercial off-the-shelf software? Isn't that a way around the failure risks associated with long development cycles? That's true in theory, but COTS applications come with their own problems. That gets us to the second major cause of failure behind the government's poor IT performance – trying to force-fit COTS applications to meet specific agency needs.

Commercial off-the-shelf software applications seem like an obvious answer. Instead of building systems from scratch, each agency should just license already available software specifically designed for the need they have. But the theory quickly breaks down in practice (even with "GOTS" or government off-the-shelf software). Software companies that create COTS solutions have to design them to meet as many of the common needs across the largest group of potential clients as possible. This allows them to maximize their revenue and profit. But it also means that few (if any) customers get all their needs met with the out-of-the-box product. Believe it or not, there's someone inside of every COTS software company who gets to decide what goes on their "product roadmap" and which customers will be happy and which will be disappointed (*I know because I used to be that person!*).

Frustration with the available COTS solutions for Federal acquisition and contract writing systems is very apparent. I recently sent out a survey to a diverse base of Federal acquisition personnel with responsibility for their agency's acquisition systems. Thirty-five percent of the respondents said they have adopted a manual workflow outside of the application to cope with limitations in the application. Another 30% use specific workarounds such as downloading data and e-mailing it to process participants, removing control of the process from the application. *Why can't these customers get the application functionality they need?* High cost of change is often the answer. Sixty percent of respondents stated they requested application changes from the vendor, but decided against them once they received a cost estimate. Seventy two percent believe their organizations would be much more productive if they could modify their software at low or no cost.

The survey results are not surprising. Customers of COTS acquisition products have to either 1) pay for customization and risk being kicked off a product upgrade path, 2) create manual workarounds to bypass software limitations, or 3) change their work processes to fit the capabilities of the software. As if that wasn't bad enough, organizations that buy COTS software often find themselves in the middle of "application sprawl" as they end up buying lots of individual applications, each designed to tackle one specific job. Data integration across these systems can be a nightmare, the costs of which are never estimated in the business case for any one individual application purchase.

To minimize the downsides of buying COTS, organizations create extremely long lists of specific functionality they want to see demonstrated in an evaluation process. This is logical. If the software is hard or expensive to change, you want to pick the application that will need the least change. But pursuing this path only leads to a false sense of comfort for three reasons:

- Gathering a complete list of requirements to evaluate is challenging
- It's hard to evaluate how well software meets a specific need until you've used it for several months
- No one can predict what new requirements will come along even just a few months after the purchase (but it is a certainty that there will be some)

All of these factors combine to point out the fallacy of evaluating COTS software products in an RFP process. Even after reviewing potentially hundreds of specific capabilities, the team won't have enough hands-on experience to know whether the application will really meet users' needs today or when things change in the future. Cost estimates to purchase and configure the software shared during the evaluation process don't include the cost of customizations you don't even know you need yet (but you can be sure they won't be cheap once the vendor has you locked). Vendors might promise you they can make lots of small changes to fit your needs, but those generally have to go through their "Change Control Boards" (for more information on those and other COTS issues, see my blog post, "What Lurks Deep Inside COTS Acquisition Software License Agreements").

NAVIGATING THE NEW LANDSCAPE FOR YOUR NEXT GENERATION ACQUISITION AND CONTRACT WRITING SYSTEM

Let's say your agency is in the market for a new acquisition and contract writing system. You would have plenty of company as last year's decision by the DoD to cease support for SPS, the DoD-wide procurement system, allows each branch of the service to choose their own system with a short time frame to get it done. This has set a lot of people looking.

All of those searchers will find the information I outlined above as they begin their processes. *What will they conclude?* Any type of custom-built system using waterfall methods is out of the question (*specifically written out of the rules by the DoD*). COTS acquisition software systems are a possibility, but they have all of the problems previously stated. Could an ERP system possibly serve as a contract writing system? Not without an even great order of magnitude in force-fitting than COTS systems designed for Federal acquisition, making ERP an even poorer option.

What these people really want is a custom developed application created around their specific agency's procurement needs. It would have to be created using an Agile development approach and have an architecture that could be easily modified to adapt to future needs. Costs are important too. Initial costs need to be the same or less than traditional methods and future costs need to be predictable and low. Time to go-live has to be short to meet impending system deactivation dates.

This kind of solution was impossible just a few years ago. But it is available now thanks to specific developments in the ever evolving world of technology. Forward-thinking vendors have pulled these capabilities together into a platform for a next generation of Federal acquisition and contract writing systems.

Here are the components that make up this new approach to acquisition software solutions:

- **Business Process Management (BPM) Platform** – At the core of these new solutions is a codeless development environment where application designers simply drag and drop icons to create functionality. This removes any trace of "throwing the design over the wall" to have the engineers create the system. Application users and designers can now sit side by side and communicate efficiently through flow diagrams that are actually building program logic.

- **Acquisition “Framework”** – While every agency has unique requirements for their procurement and contract writing system, much of what those systems do is common. Any one implementation from these new systems starts from a framework that contains the common elements. This framework is very different from a COTS product. It is not functioning software by itself. It needs to be completed and tailored to fit around a specific customer’s needs, creating a unique product every time. The framework serves as a project accelerator, lowering the development cost, shortening the time to first go-live, and increasing the breadth of functionality at launch. The completion of a framework can happen in less time than the deployment of a COTS product.
- **Native Mobile Clients** – Because the software developers of the platform don’t spend their time hard-coding specific application functionality, they can invest in making the underlying platform more functional and more easy to use. A great example is adding mobile process participation through native mobile apps. Native mobility as a core platform capability allows developers to quickly make their applications mobile without ever having invested one dollar in building their own mobile clients.
- **Integrated Social Communication** – Social media is quickly becoming a common tool in corporate environments. Tying it directly to process events greatly increases its utility which is easy to accomplish in this type of platform.

HOW TO KEEP YOUR EVALUATION PROCESS FROM EXCLUDING NEXT GENERATION PROCUREMENT SYSTEMS

You won’t end up buying next generation software if you use last generation’s evaluation process. That’s what many Federal acquisition professionals are doing accidentally because they don’t know how to change their evaluation process to accommodate new software models. Without updating your approach, you’re likely to end up being forced to choose between traditional COTS applications and waterfall development approaches. Choosing either one of those paths in today’s environment is likely to get your project on the front page of a newspaper (*keep this in mind... in today’s world, you don’t end up on the front page for being a success!*).

Here are the most important things to keep in mind when writing RFIs and RFPs to ensure next generation systems become options:

- **Ask for “COTS-based”, Not Just “COTS”** – This might seem like a small distinction, but it is actually big. If you limit your search to only COTS products, highly flexible and adaptable next generation systems may be excluded. This is because to deliver their level of customization, the solutions technically aren’t “off-the-shelf” although the platforms they are built on are, hence the “COTS-based” phrase.
- **Create Alternatives to the Long Functionality Check List** – When your focus is on COTS products, you definitely want to evaluate a long check list of specific functionality, knowing full well that anything not in the product you buy will be expensive to add (or to work around). But long functionality lists work against next generation systems. These software products focus on flexibility so anything you need later can be added with little cost or effort. Their acquisition frameworks will have many capabilities to demonstrate, but are unlikely to have the majority of the items on your list. Ironically, they are probably better able to meet your full needs once installed than COTS products that meet most, but not all capabilities during an evaluation. It is okay to still have a list of specific functionality, just be sure your scoring method won’t inadvertently penalize next generation systems. This can be countered by the next three items below.

- **Evaluate and Score Architecture** – Create evaluation criteria around the underlying solution architecture. This wasn't necessary when evaluating between COTS applications that were all proprietary, but is critical now that different architecture models are available and agency CIO's are requiring open approaches.
- **Require Demonstrations of Changes to Core Logic** – You wouldn't have included this in past evaluations because no COTS vendors would entertain creating a core logic change as part of a demonstration when they would otherwise charge hundreds of thousands of dollars for it. But now that new architectures exist that make rapid changes possible, you must include a demonstration of changes to draw clear distinctions between options.
- **Require Scoping for an Incremental Build Out** – One of the great advantages of next generation systems built on BPM platforms is that they can easily be extended to add related functionality. For example, an acquisition system could be extended to automate the process of responding to congressional inquiries on specific procurements. Be sure to require all vendors to state how they would meet such a request that's not part of the core functionality today and what it would cost so you understand system flexibility.
- **Require Native Mobile Clients and Social Communications** – We've already seen specific guidelines from the Federal CIO including "Cloud First", "Shared First", and "Future First." Given the way mobile and social technology are growing, we can bet that it won't be long before the "Mobile First" and "Social First" initiatives come out. Get ahead of the wave by adding evaluations for mobile and social technology.

It is also important to evaluate the end user license agreements (EULAs) from potential vendors early in the process. These are often filled with restrictions that can substantially increase the total cost of ownership of your software. Look for items like a requirement to purchase upgrades in order to stay on maintenance, who gets ownership rights of any customizations you pay them to create, and restrictions on your ability to share anything you've done with their software with other users. (For more information EULA issues, see my blog post, "[What Lurks Deep Inside COTS Acquisition Software License Agreements.](#)")

FINAL NOTE: THINKING BEYOND YOUR ACQUISITION NEEDS – HOW TO REALLY WIN AND SHINE!

Everything I've written so far will help ensure you get a next generation acquisition system that will perform dramatically better than those of the past. Follow this advice and you'll achieve your goal. But if you widen your view just a little broader, you'll see ways to really win and set your agency on a path to have a dramatically more effective and cost-efficient software infrastructure.

The view you need to have is that, in today's world, *no software application exists by itself*. All of the applications in your agency integrate with each other... or they should. Even COTS applications that have limited, specific purposes need to talk to other systems to get input data and share results. Agencies that build their software architecture around multiple COTS applications spend a lot of money on software licenses and are challenged to make their COTS applications play well together. Multiple applications built on the same flexible platform will not only be custom tailored to your agency's needs, they will also work together seamlessly because they share a common foundation.

ABOUT THE AUTHOR

Evan McDonnell is Appian's Vice President of Solutions. As senior executive at multiple software companies over the past twenty years, Evan has maintained a steady focus on helping organizations achieve competitive advantage and operational efficiencies through better use of technology. Evan continually strives to understand what prevents organizations like the Federal government from getting software solutions that really meet their needs and using this insight to drive breakthrough solutions. Evan holds a BS degree in Mechanical Engineering from Carnegie Mellon University and an MBA from Harvard Business School.

