



WHITE PAPER

What Agile Offers Government IT Leaders

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What Agile Offers Government IT Leaders

One of the few areas of agreement in Washington is concern about the state of IT project management. As Jeffrey Zients, the federal government's Chief Performance Officer, [noted](#) earlier this year, "too often, we don't get a high-enough return on our IT investments. There are pockets of strong performance, but in too many situations, our IT projects run over budget, behind schedule, or fail to deliver on promises."

This issue was a major focus of the *White House Forum on Modernizing Government* held earlier this year. There, a cross-section of corporate CEOs and government leaders [concluded](#) that:

. . . [M]ost Federal Government IT projects are too large and not sufficiently integrated into business unit operations. Multi-year Federal IT efforts are typically driven by technology managers— who often turn over during the life of the project—rather than agency business leaders. Agency business leaders are not held accountable for project success, and in turn do not adequately invest in IT project management. As a result, in comparison to industry best practices, Federal IT projects are too often marked by milestones spaced too far apart and deliverables that fail to deliver tangible end-user value. Further, Federal IT change efforts are typically managed in isolation from business operations, so those working on long-term solutions are too often not concerned with, or even aware of, the evolution of day-to-day business considerations.

Having led major development programs within the government, I can add that many of these challenges stem from an overreliance on traditional software development models. Too often, these legacy approaches lock users into fixed and lengthy development processes that don't readily accommodate change. What happens is that requirements evolve during this extended period, meaning that the final product often fails to meet real-world requirements.

Among the specific recommendations of the *White House Forum on Modernizing Government* were the need for greater transparency in project management; closer integration and more consistent involvement of line management in the development process; and shorter delivery timeframes with more regular mileposts. These changes would help to ensure closer alignment between IT and the mission, helping close a gap driving many inefficiencies today.

These proposed changes to how we develop and deploy new systems are significant. Fortunately, a framework – agile software development – already exists for implementing many of these best practices. And agile has already been shown to deliver significant benefits for major government programs in terms of time-to-value, overall quality and their responsiveness to changing business requirements.

Systemic Challenges Facing Government IT Programs

By definition, the traditional ‘waterfall’ model for software development used throughout government is sequential and highly regimented. By locking down requirements at the onset of the process and limiting subsequent stakeholder involvement, this approach often fails to:

- Identify and correct problems early in the development process when it is less costly and disruptive to do so;
- Respond effectively to subsequent changing requirements (and there will always be changes); or
- Incorporate lessons learned and other improvements into the final product.

What this process often produces is an off-target solution, despite years of development, which fails to meet the user’s real world needs. In the worst case scenario, failed projects are resurrected over-and-over with the expectation of a different outcome despite using the same flawed process.

To put this into perspective, the waterfall approach to software development builds upon traditional manufacturing models in that it relies upon a series of highly segregated phase – requirements analysis, design, development, quality assurance and so on. However, even manufacturers are moving away from a strict reliance on these conventional models. Instead, they are embracing lean manufacturing, six sigma, just-in-time delivery and other emerging concepts to produce higher quality products, greater operational efficiency and responsiveness, and faster time-to-value.

A More Empirical, Modular and Collaborative Approach to Software Development

A similar revolution is impacting the world of software development. For example, software giant SAP recently announced [plans](#) to transition much of its development to the agile model. Agile is expected to allow the company to reduce development times, extend stakeholder collaboration and improve its responsiveness to market change.

In terms of specifics, agile software development is an umbrella methodology encompassing a number of disciplines. These underlying techniques include Scrum, eXtreme Programming (XP), Continuous Integration and Test-Driven Development, each of which addresses specific functions and requirements. What they share in common is a commitment to delivering solutions with more efficiency, coherence, and responsiveness. As the Agile Manifesto [states](#), “our highest priority is to satisfy the customer through early and continuous delivery of valuable software.”

One of agile’s principal differences with waterfall is that it is an *empirical* approach, which means it relies on actual measurements and assessments to continually reevaluate and improve the solution. By contrast, waterfall is a *defined* methodology in which the design and

requirements are fixed at the onset of the project with a goal of locking in the feature set early. This empirical approach not only yields continuous improvement, but it also ensures the flexibility necessary to respond to unforeseen demands.

Agile is also a more *modular* approach that allows big deliverables to be broken into smaller, self-contained components that can be developed and implemented more quickly. This is consistent with the industry-wide shift to service-oriented architecture (SOA), software-as-a-service (SaaS) and cloud computing in which new features and functionality are added incrementally – Lego like – to deliver faster return-on-investment (ROI). Often, these upgrades are released on a quarterly basis.

Finally, agile is a more *collaborative* approach on several levels. Integrated project teams encompassing design, development and testing work in short duration sprints – typically two to four weeks – to deliver functioning software components. As a result, problems can be identified and remediated as they are created. They also meet regularly with stakeholders at the end of each sprint to assess performance and reevaluate priorities. This focus on developing working software within each sprint is critical as it provides users with the opportunity to evaluate this functionality firsthand – to ask, “is this what I envisioned?” – and adjust as needed.

Inherent in an empirical, modular and collaborative approach is the need for measurement and transparency to drive accountability. For example, a number of automated tools have been created to measure and assess the real-time performance of agile projects. This data is widely used to improve quality, to create more accurate plans and forecasts, and to assess and mitigate risk.

From a stakeholder perspective, the unique characteristics of agile produce a number of strategic benefits, including:

- **Faster Time-to-Value** – As functionality is delivered in a modular fashion, users can capitalize on new features more quickly.
- **Higher Quality** – Defects are caught and remediated earlier in the process as testing is fully integrated.
- **Risk Mitigation** – Program managers and other stakeholders can continually assess progress based on real-time performance data.
- **Better Solutions** – Continuous user feedback results in more effective solutions.

Taken as a whole, agile has allowed program managers to deliver major systems on-time, on-budget and on-scope with greater consistency.

Government Ready

History has shown that not every commercial best practice is suitable for the public sector. However, agile has been successfully adopted by a number of federal agencies to support their most high profile projects. In addition, contractors like Agilex have based their software development processes on these practices. What these pioneers share is a realization that agile isn't necessarily a replacement for existing processes and techniques, but rather, it is often a complement or enhancement.

As just one example, the Federal Health Architecture (FHA) program, operating under the Office of the National Coordinator for Health IT (ONC), used agile practices exclusively to develop the award-winning CONNECT Solution in less than a year. This was despite the challenges inherent in creating a nationwide health information exchange network from scratch as the project also served as an important research & development exercise for ONC. Subsequently, new functionality has been added on a quarterly basis. For the project, we delivered developer productivity that was five times the industry average while defect rates were just a quarter of similar projects. This has enabled eight consecutive quarters of on-time, on-budget product deliveries.

Likewise, the U.S. Navy's SPAWAR Command relied on agile to develop the Chapter 33 Long-term Solution for the Department of Veterans Affairs. As VA CIO Roger Baker [explained](#) during a media conference call, "we developed this completely under an agile methodology. What's important about that is that [education services] subject matter experts and my IT folks worked side-by-side, day-in and day-out to develop the user interface and the rules and the workflow in this system to be *optimal* [italics added] for the processing of these types of claims by the folks that are the claims examiners."

This project was also noteworthy as it faced a number of Congressionally-mandated deadlines for delivering specific functionality. In addition to meeting this compressed delivery timeline, third-party analysis found that end-user acceptance for the solution was 'very high.' Ultimately, the detailed reporting offered by agile proved critical to restoring confidence and support for the project with skeptical stakeholders, including members of Congress.

Compliance with Emerging Mandates

Driven by the concerns noted earlier, the federal government is in the process of reevaluating how it manages large IT projects. In order to ensure the sustainability of major programs, the technology gap with the private sector must be closed so that these programs can operate more efficiently. Urgency for delivering upon technology's potential stems from the growing recognition that budgets are unlikely to grow for the foreseeable future and may be cut in some cases.

In issuing new guidance for the management of federal IT projects, the Office of Management & Budget (OMB) [argued](#):

. . . [T]his guidance initiates a re-examination of these expensive and lengthy investments in financial modernization solutions in favor of shorter-term, lower-cost, and easier-to-manage solutions. By dividing projects into smaller segments that deliver the most critical functionality more quickly, Federal agencies will achieve greater functionality sooner, better align projects to their organizations capacity to manage change, and reduce risk and cost.

From our perspective, what's clear is the role that agile can play in enabling this transformation. As an empirical approach, it relies upon regular and in-depth assessments to deliver greater transparency and accountability. It also mandates the continuing involvement of stakeholders in the decision-making process, which is needed to ensure that IT projects remain aligned with the requirements of the mission. In addition, it utilizes short-duration sprints and regular delivery timeframes to keep projects focused and on-track. In other words, agile addresses many of the most important gaps in current IT project management approaches.

When to Use Agile

While agile offers great potential for the federal government, it shouldn't be viewed alone as a panacea. Many of the most successful adopters employ it as a complement or enhancement to their existing development processes, one of many weapons in their arsenal.

What's important is to use the right tool for the right application. In terms of the types of projects that benefit most from agile, they include the following:

- **Fixed time and/or budget constraints** – Agile works extremely well for projects with firm delivery dates and/or budgets, such as the VA's Chapter 33 Long-term solution. As noted earlier, traditional approaches strive to lock-in requirements, budget and timeline early in the development process, often before the project's full scope is clear. As a result, projects experience frequent delays and cost overruns as additional requirements are uncovered and incorporated into the plan. In contrast, agile projects work with time-based constraints with available budget often driving this decision-making. Thus, project scope is based on what can be accomplished within this defined time period. Rather than delaying delivery while extraneous features are added, agile projects deliver core functionality as quickly as possible.
- **Research-driven Initiatives** – Within emerging fields, the project objective isn't simply to deliver the solution, but often to also identify how the solution can be developed so that others can replicate this process. The FHA's CONNECT Solution, which pioneered new approaches to health information exchange, is a good example of this scenario.

Working with new ideas and approaches, project teams benefit from agile's empirical approach as it provides a framework to continually test and refine their solution hypothesis.

- **Open-ended development** – Due to their significant scope, some projects have fairly long-term and ongoing delivery timelines. These projects include major enterprise systems, such as ERP or clinical information systems, as well as those requiring frequent updates, such as an enterprise service bus. Consider SAP's adoption of agile as one example. The value that agile offers is the ability to break these projects up into smaller components that can be delivered within a defined time period, typically 90 to 180 days. In addition to making the project more manageable, this incremental delivery model enables faster time-to-value.

Of course, with agile serving as an umbrella methodology for multiple disciplines, it can be readily configured to meet each project's unique requirements.

Ultimately, the challenges that we face are real, but the answers are apparent as well. In this case, agile is clearly emerging as a solution to the cost, performance and other pressures facing major government IT programs. IT leaders should carefully evaluate how these best practices can be implemented with their development organization.

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