GAO’s Agile Assessment Guide

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Outline

• GAO Background
  • About GAO
• Guides and Best Practices
• Previous GAO Work on Agile
• Agile Guide Overview
• Chapter 3 Overview: Agile Adoption Best Practices
• Chapter 7 Overview: Acquisition Best Practices
• Chapter 9 Overview: Agile Execution Best Practices
• Questions
Learning Objectives

• To provide an overview of key themes to effectively manage software products using Agile methods in the government

• To disseminate information regarding the best practices GAO has developed through our internal research and discussion with approximately 400 experts

• To share information about practical challenges in the federal government among participants during the question and answer period
About GAO

• GAO is an independent, nonpartisan agency serving the Congress and helps improve the performance and ensure the accountability of the federal government.

• Core values are Accountability, Integrity, and Reliability

• To ensure independence, the Comptroller General (CG) is appointed to a 15-year term by the President. Other than the CG, there are no political appointees at GAO.
GAO work is primarily done at the request of congressional committees or subcommittees or is mandated by public laws or committee reports. We also undertake research under the authority of the Comptroller General.

Some examples of our work include:

- Auditing agency operations to determine whether federal funds are being spent efficiently and effectively
- Investigating allegations of illegal and improper activities
- Reporting on how well government programs and policies are meeting their objectives
- Performing policy analyses and outlining options for congressional consideration
- Issuing legal decision and opinions, such as bid protest rulings and reports on agency rules

More information about GAO can be found at www.gao.gov
GAO Guides and Best Practices

Purpose of these documents is two-fold:

• Provide criteria for GAO to use when performing audits
• Provide guidance for agencies

• **Cost Estimating and Assessment Guide** (March 2009, GAO-09-3SP)
• **Schedule Assessment Guide** (December 2015, GAO-16-89G)
• **Technology Readiness Assessment (TRA) Guide** (August 2016, GAO-16-410G)
GAO Guides and Best Practices
Expert Group Process

• To develop these guides, GAO compiles a list of experts in that area to discuss topics

• For example, the Cost Expert Group was established in 2005 and has since grown to include experts on schedule analysis and earned value management
  • Group meets twice a year to discuss a variety of related issues
  • Contributions have been invaluable both in
    • Providing historical information and experience
    • Keeping the Guide current with industry trends

• GAO has currently assembled an Agile Expert Group
  • The group’s first meeting occurred on August 30, 2016
## Table: 10 Practices Used and Found Effective by Five Agencies

<table>
<thead>
<tr>
<th>Practice</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Start with Agile guidance and an Agile adoption strategy.</td>
<td>Empower small, cross-functional teams.</td>
</tr>
<tr>
<td>Enhance migration to Agile concepts using Agile terms and examples.</td>
<td>Include requirements related to security and progress monitoring in your queue of unfinished work (backlog).</td>
</tr>
<tr>
<td>Continuously improve Agile adoption at both project and organizational levels.</td>
<td>Gain trust by demonstrating value at the end of each iteration.</td>
</tr>
<tr>
<td>Seek to identify and address impediments at the organization and project levels.</td>
<td>Track progress using tools and metrics.</td>
</tr>
<tr>
<td>Obtain stakeholder/customer feedback frequently and closely.</td>
<td>Track progress daily and visibly.</td>
</tr>
</tbody>
</table>

*Source: Software Development: Effective Practices and Federal Challenges in Applying Agile Methods. | GAO-12-681*
### Table: 14 Identified Federal Challenges

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Challenge</th>
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<tbody>
<tr>
<td>Teams had difficulty collaborating closely.</td>
<td>Procurement practices may not support Agile projects.</td>
</tr>
<tr>
<td>Teams had difficulty transitioning to self-directed work.</td>
<td>Customers did not trust iterative solutions.</td>
</tr>
<tr>
<td>Staff had difficulty committing to more timely and frequent input.</td>
<td>Teams had difficulty managing iterative requirements.</td>
</tr>
<tr>
<td>Agencies had trouble committing staff.</td>
<td>Compliance reviews were difficult to execute within an iteration time frame.</td>
</tr>
<tr>
<td>Timely adoption of new tools was difficult.</td>
<td>Federal reporting practices do not align with Agile.</td>
</tr>
<tr>
<td>Technical environments were difficult to establish and maintain.</td>
<td>Traditional artifact reviews do not align with Agile.</td>
</tr>
<tr>
<td>Agile guidance was not clear.</td>
<td>Traditional status tracking does not align with Agile.</td>
</tr>
</tbody>
</table>

*Source: Software Development: Effective Practices and Federal Challenges in Applying Agile Methods. | GAO-12-681*
### Table: Implementation of Key Agile Practices for USCIS ELIS

<table>
<thead>
<tr>
<th>Practice</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete planning for software releases prior to initiating development and ensure software meets business expectations prior to deployment.</td>
<td>⬜️</td>
</tr>
<tr>
<td>Adhere to the principles of the framework adopted for implementing Agile software development.</td>
<td>⬜️</td>
</tr>
<tr>
<td>Define and consistently execute appropriate roles and responsibilities for individuals responsible for development activities.</td>
<td>⬜️</td>
</tr>
<tr>
<td>Identify users of the system and include them in release planning activities.</td>
<td>⬜️</td>
</tr>
<tr>
<td>Write user stories that identify user roles, include estimates of complexity, take no longer than one sprint to complete, and describe business value.</td>
<td>⬜️</td>
</tr>
<tr>
<td>Prioritize user stories to maximize the value of each development cycle.</td>
<td>⬜️</td>
</tr>
<tr>
<td>Set outcomes for Agile software development.</td>
<td>⬜️</td>
</tr>
<tr>
<td>Monitor and report on program performance through the collection of reliable metrics.</td>
<td>⬜️</td>
</tr>
</tbody>
</table>

Source: GAO analysis of USCIS documentation. | GAO-16-467
• **Objective**: Determine the extent to which TSA has implemented selected key practices for transitioning to Agile software development for the Technology Infrastructure Modernization (TIM).

• **Outcome**: The program fully committed to Adopt Agile, yet only fully implemented two of six leading practices essential to ensure effective Agile adoption.

  • Two leading practices fully implemented:
    • Obtaining full support from leadership to adopt Agile processes
    • Enhancing staff Agile knowledge by providing training
  
  • Four leading practices still needed to be fully implemented:
    • Ensuring product owners are engaged with the development teams and have clearly defined roles
    • Establishing a clear product vision that aligns to program requirements
    • Prioritizing backlogged requirements with priority levels and user stories
    • Implementing automated tools to enable rapid system development and deployment
GAO Agile Assessment Guide

- Chapter 1 – Background
- Chapter 2 – Compliance and Past Work
- Chapter 3 – Agile Adoption Best Practices
  - Team activities, Program processes, and Organizational Environment
- Chapter 4 – Agile Implementation Challenges
- Chapter 5 - Agile Metrics
- Chapter 6 – Requirements Decomposition
- Chapter 7 – Agile and the Federal Acquisition Process
  - Agile and Federal Contracting Process
- Chapter 8 - Agile and Program Management Factors
  - Program Planning and Tradeoffs, Team composition
- Chapter 9 – Agile Program Control Best Practices
  - Cost estimating, Scheduling, and Earned Value Management

Appendices:
- Agile Glossary
- Effects of not following best practices
- Agile Methodologies
- Debunking Agile Myths
- Questions for Auditors and Managers
- Case Study Descriptions

GAO is currently working to develop the Agile Assessment Guide exposure draft. Expected out on the GAO webpage: Early 2020
Agile Adoption Best Practices
Chapter 3

1. Team composition supports Agile methods
2. Work is prioritized to maximize value
3. Repeatable processes are in place

4. Staff are appropriately trained in Agile methods
5. Management has established an Agile supportive environment
6. Technical environment enables Agile development
7. Program establishes project planning controls that are compatible with Agile

8. Organizational processes support Agile methods
9. Organizational culture supports Agile methods
10. Organization acquisition process supports Agile methods

Source: Goes here | Product #
## Agile and Contracting Best Practices

### Chapter 7

<table>
<thead>
<tr>
<th>Best Practice</th>
<th>Summary</th>
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| Tailor contract structure and inputs to align with Agile practices | • Encourage the use of modular contracting.  
• Establish contract with sufficient structure to protect all parties and achieve the desired mission outcomes, while offering flexibility for adaptation of software requirements.  
• Decide whether the contract should be structured for deliverables or services. |
| Incorporate Agile metrics, tools, and lessons learned from retrospectives during the contract oversight process | • Ensure that contract data requirements rely extensively on Agile metrics  
• Collect actual data from the program’s releases, features, and capabilities to enable contract oversight and hold contractors accountable for producing quality deliverables  
• Enable retrospectives to allow stakeholders to interact with the development team and the product owner to continually improve Agile methods based on lessons learned.  
• Ensure that contract oversight reviews align with the program’s Agile processes and cadence. |
| Integrate the program office and development teams | • Develop a common understanding of Agile techniques among the development and the acquisition teams so that an acquisition strategy can be properly structured.  
• Train contracting personnel to enable an Agile mindset.  
• Identify clear roles for contract oversight and management, including a designated user with authority to make decisions quickly and to prioritize requirements within the scope of the project road map.  
• Ensure that all personnel are familiar with the contract’s scope to identify and minimize when a contract needs to be modified. |
The chapter discusses developing a work breakdown structure (WBS) used by management and Agile teams to provide a clear picture of the total scope of work necessary to meet a program’s requirements.

Cost estimating, scheduling, and earned value management (EVM) best practices established in earlier guides are still applicable to Agile projects.

The chapter also highlights considerations for each item. For example:

- Cost Estimating: Sizing
- Scheduling: Minimizing constraints
- EVM: Calculating variances
Thank you

Guides Available Online and Downloadable in PDF:

GAO Cost Estimating and Assessment Guide:
http://www.gao.gov/products/GAO-09-3SP

GAO Schedule Assessment Guide:
http://www.gao.gov/products/GAO-12-120G

GAO Technology Readiness Assessment Guide: