

COMMITTEE ON WAYS AND MEANS

U.S. HOUSE OF REPRESENTATIVES

WASHINGTON, DC 20515

August 5, 2016

Ms. Kimberly Byrd
Deputy Assistant Inspector General for Audit
Financial Systems and Operations Audits
Office of the Inspector General
Social Security Administration
6401 Security Boulevard
Woodlawn, MD 21207

Dear Ms. Byrd:

Thank you for your testimony before the Committee on Ways and Means Subcommittee on Social Security at the July 14, 2016 hearing on “Modernizing Social Security’s Information Technology Infrastructure.” In order to complete our hearing record, we would appreciate your responses to the following questions:

1. What does a successful Information Technology (IT) modernization plan need to consist of, and, to date, has the Social Security Administration (SSA) provided an IT modernization plan that is sufficient?
2. How confident are you in the timeline and cost estimates provided by the SSA?
3. What are the challenges to auditing a project that uses Agile IT development? How are you adapting to these challenges?
4. The SSA Office of Inspector General recently released a report indicating that the SSA did not adequately evaluate Commercial-Off-The-Shelf (COTS) products when analyzing alternatives to internal development of its Disability Case Processing System. What are the best practices for evaluating COTS products as an alternative to internal IT development?

We would appreciate your responses to these questions by **August 18, 2016**. Please send your response to the attention of Amy Shuart, Staff Director, Subcommittee on Social Security, Committee on Ways and Means, U.S. House of Representatives, B-317 Rayburn House Office Building, Washington, DC 20515. In addition to a hard copy, please submit an electronic copy of your response in Microsoft Word format to mm.russell@mail.house.gov.

Thank you for taking the time to answer these questions for the record. If you have any questions concerning this request, you may reach Amy at (202) 225-9263.

Sincerely,

A handwritten signature in blue ink that reads "Sam Johnson". The signature is written in a cursive, slightly stylized font.

Sam Johnson
Chairman
Subcommittee on Social Security

August 18, 2016

The Honorable Sam Johnson
Chairman, Subcommittee on
Social Security
Committee on Ways and Means
United States House of Representatives
Washington, DC 20515

Attention: Amy Shuart

Dear Chairman Johnson:

This is in response to your questions for the record, further to testimony by Deputy Assistant Inspector General Kimberly Byrd on July 14, 2016, before the Subcommittee on Social Security, Committee on Ways and Means, at a hearing on Modernizing Social Security's Information Technology Infrastructure. I appreciate the opportunity to provide additional information on these issues to the Subcommittee. Please see responses to your specific questions below.

1. What does a successful Information Technology (IT) modernization plan need to consist of, and, to date, has the Social Security Administration (SSA) provided an IT modernization plan that is sufficient?

We received a copy of SSA's IT Modernization Plan on July 12, 2016, and SSA briefed us on the plan on July 13, 2016. We have not yet conducted an in-depth review of the Agency's plan, thus we cannot express an opinion about the sufficiency of the plan at this time. That said, we believe a modernization plan should clearly document what SSA expects to achieve, in what timeframe, and at what cost. The legislation that would fund SSA for Fiscal Year 2017, if enacted, would require SSA to provide Congress a detailed report on its IT modernization plan in its Fiscal Year 2018 budget request. We believe the reporting requirements in the proposed legislation are very comprehensive, and the report would provide the level of detail the Office of the Inspector General, the Congress, and the public needs to understand and track SSA's IT modernization efforts.

2. How confident are you in the timeline and cost estimates provided by the SSA?

We received a copy of SSA's IT Modernization Plan on July 12, 2016, and SSA briefed us on the plan on July 13, 2016. We have not yet conducted an in-depth review of the Agency's plan, thus we cannot express an opinion about the timeline or cost estimates at this time. We will be available to meet with Subcommittee staff and share our thoughts after we review and evaluate the Agency's plans.

3. What are the challenges to auditing a project that uses Agile development? How are you adapting to those challenges?

Agile is a software development approach that involves building software incrementally and requires close collaboration among programmers and business experts. Agile does not easily align with certain Federal processes and requirements and, as a result, introduces challenges for those responsible for auditing/evaluating projects that employ Agile methodologies. For example, Federal contracting procedures generally call for detailed plans and requirements be established up-front. However, with Agile, requirements are not known in advance.

According to SSA, the iterative nature of Agile makes it challenging to conduct long-range project planning. However, we believe SSA should deliver cost estimates for the “sprints” required to deliver software incrementally.

In April 2016, the Office of Management and Budget (OMB) released a guide outlining best practices and examples to support Agile development. OMB expects to develop Agile performance measurements, create an Agile Dashboard, and update IT-investment reporting mechanisms this fiscal year. Once OMB releases its formal guidance on Agile, we will review the guidance and incorporate it into our ongoing audit work planning effort.

4. The SSA Office of Inspector General recently released a report indicating that the SSA did not adequately evaluate Commercial-Off-The-Shelf (COTS) products when analyzing alternatives to internal development of its Disability Case Processing System. What are the practices for evaluating COTS products as an alternative to internal IT development?

To clarify, we stated in our May 2016 report, [*The Social Security Administration’s Analysis of Alternatives for the Disability Case Processing System*](#) (A-14-16-50078), that SSA did not fully evaluate all potential alternatives after “resetting” the DCPS project. With regard to COTS alternatives, SSA limited its evaluation to one specific product as a potential alternative to the case-management component of DCPS. According to SSA, another full alternatives analysis would have resulted in additional project costs and delays.

Per OMB, agencies should update alternatives analysis periodically to capture changes in the context for an investment decision, and they should generally consider upgrading, sharing, or converting existing systems or maintaining the legacy systems. We asked SSA whether it considered other alternatives—for example, phasing an existing system into all Disability Determination Services or procuring and modernizing one of the vendor-supported legacy systems. Agency personnel informed us they held “high-level brainstorming sessions” around these alternatives but ultimately dismissed them. According to SSA, the estimated costs, and the lack of internal expertise for the legacy systems that the Agency does not own, made these alternatives not viable. Consequently, we concluded SSA did not sufficiently evaluate all alternatives for DCPS. We reported that, without a comprehensive analysis of alternatives, the Agency cannot be assured the chosen option will be the best path to simplify system support and maintenance and reduce infrastructure costs.

Should you have further questions, please feel free to contact me, or your staff may contact Special Agent Kristin Klima, Congressional and Intra-governmental Liaison, at (202) 358-6319.

Sincerely,

A handwritten signature in cursive script that reads "Gale Stallworth Stone".

Gale Stallworth Stone
Acting Inspector General

COMMITTEE ON WAYS AND MEANS

U.S. HOUSE OF REPRESENTATIVES

WASHINGTON, DC 20515

August 5, 2016

Mr. William Hayes
Software Engineering Institute
Carnegie Mellon University
4500 Fifth Avenue
Pittsburgh, PA 15213

Dear Mr. Hayes:

Thank you for your testimony before the Committee on Ways and Means Subcommittee on Social Security at the July 14, 2016 hearing on “Modernizing Social Security’s Information Technology Infrastructure.” In order to complete our hearing record, we would appreciate your responses to the following questions:

1. What metrics generated by the Agile development process can Congress use in the oversight of Agile projects?
2. What are the best practices for employing Agile development methods within a Federal framework?
3. Is it possible to estimate total project costs for an IT project using Agile development methods? What about lifecycle costs?

We would appreciate your responses to these questions by **August 18, 2016**. Please send your response to the attention of Amy Shuart, Staff Director, Subcommittee on Social Security, Committee on Ways and Means, U.S. House of Representatives, B-317 Rayburn House Office Building, Washington, DC 20515. In addition to a hard copy, please submit an electronic copy of your response in Microsoft Word format to mm.russell@mail.house.gov.

Thank you for taking the time to answer these questions for the record. If you have any questions concerning this request, you may reach Amy at (202) 225-9263.

Sincerely,



Sam Johnson
Chairman
Subcommittee on Social Security

The Agile In Government Team at Carnegie Mellon University's Software Engineering Institute (SEI) is pleased to provide the following responses to Questions For the Record. Where appropriate, we have referenced the written testimony provided in advance of the hearing to support the information supplied here.

1. [What metrics generated by the Agile development process can Congress use in the oversight of Agile projects?](#)

Most Agile methods specify **team level metrics** and do not provide information that would meet needs for Congressional oversight. However, this does not mean that metrics do not exist to help Congress provide oversight on projects using Agile.

The performance of the software should be assessed against the performance of the business processes the software supports. Agencies undertaking IT modernization must have targets for business performance. Examples include:

- reduced cycle time for key functions
- increased case-handling capacity for high demand processes
- increased reclaimed efficiency due to resolution of chronic problems
- increased volume of workload redirected from exception-handling
- increased integration of previously redundant business processes

Such business outcomes should determine which software functions are prioritized. Agile principles explicitly focus development on prioritized value delivered to customers. Congressional oversight would focus on measures related to the value derived from the software deliveries. The incremental delivery of software emphasized in Agile development allows such assessments of business impact *as the modernization effort progresses* – rather than as a summary evaluation at the end of the program.

In addition to business measures, software engineering technical measures that focus on the product, rather than the performance of development activities, are still relevant. For example, software attributes can be measured with automated tools, and careful analysis can help to determine thresholds that warn about increased difficulty in maintaining the system or likely cyber vulnerabilities.

Our publication on Agile Metrics, referenced in our written testimony, provides descriptions of a number of metrics amenable to program-level use. One such measure commonly used in large-scale government projects is earned value management.

Across the Department of Defense (DoD), major software programs over a certain dollar value are obliged to report information using a certified earned value management system (EVMS). The primary motivation for EVMS is to quantify progress independent of dollars spent, time passed, or resources consumed. Programs applying Agile at scale in the DoD have tailored EVMS approaches to focus on the delivery of major capabilities (rather than decomposing the work in terms of management and engineering activities performed). These approaches help those charged with oversight to use a familiar mechanism, while taking advantage of Agile's user-value focus.

In summary, Agile development approaches applied at scale are typically driven by a roadmap for deployment of prioritized software functions over months and quarters, rather than the annual (or longer) cycles seen under traditional development regimens. Because software delivery occurs incrementally rather than as a single batch at the end, many detailed progress metrics and technical

measures of product performance will be analyzed over time, but these generally fall below the level of actionable information for Congressional oversight. The timely deployment of software capabilities into the workflow they support is a productive focus for this oversight. Rather than relying on proxies (such as dollars spent and time passed), this approach supports incremental evaluation of important outcomes.

2. What are the best practices for employing Agile development methods within a Federal framework?

With Agile projects, the agent performing the oversight must have a strong understanding of both the project parameters and Agile principles to judge whether the practices being followed are the “best” for that project.

Below we highlight several suggestions that, based on our experience, are of particular importance to software development efforts supporting the Federal government. These suggestions amend those addressed in our previous written testimony (section 3.1 Focus Areas of Oversight Approach in Agile Settings).

First, the participation of people who can authentically represent the true needs of the system user is essential. In the Federal space, this may encompass a diverse set of perspectives. To help navigate this concern, most Agile methods tend to rely on a role called “Product Owner.” Our research shows that the “Product Owner” role may be filled by a team or some other collaborative process.

Second, it is important to staff programs adequately from the start. The gradual build-up of staff at the start of many federal IT programs creates waste from lack of momentum. In addition, once the program is up and running, developer turnover on Agile teams breaks continuity and is particularly disruptive. Agile methods emphasize rapid and iterative development of potentially shippable working software code from the very start.

Finally, our research shows that government personnel with direct oversight responsibilities must be able to adapt to the more rapid cadence of Agile delivery. Traditional mechanisms that assure due-diligence might not inherently accommodate the pace of Agile development without some adaptation. Of particular importance is the expectation that implementation work will drive the most detailed design decisions rather than the specifications approved in advance. Keeping pace with development teams and driving beneficial design choices may be out of reach for federal oversight regimens that rely exclusively on quarterly or annual reviews.

3. Is it possible to estimate total project costs for an IT project using Agile development methods? What about lifecycle costs?

Yes. Modern tools for estimating major software programs currently support estimation of Agile development. Many commercial software estimation tools provide users with benchmarks collected by the vendor from projects in their customer base. Many of these tools support development of custom cost models populated by data derived from local projects rather than published benchmarks. The DoD Integrated Lifecycle Framework recommends the use of analogy and parametric estimation in the early phases of the program. As the program progresses into implementation, however, ongoing refinement of estimates as well as estimation of more fine-grained work elements should be based on historical team performance. Because of the incremental delivery of software in short timeframes, evolving the

estimates with the new information provided is much more feasible than in traditional development settings.

The SEI's Team Software Process is an Agile-compatible method that incorporates a strong measurement framework into the software development process. The collected data help the team understand its own performance, adjust plans and make more realistic estimates of future work. (<http://www.sei.cmu.edu/tsp/index.cfm>).

SEI research on Quantifying Uncertainty in Early Lifecycle Cost Estimation (QUELCE) may be of particular interest in this area. Working with major programs in the DoD, SEI researchers have developed rigorous methods for establishing statistically sound risk models. These models help stakeholders identify cost drivers and associated probabilities and magnitudes based on calibrated expert judgment. (<https://www.sei.cmu.edu/measurement/research/quelce/index.cfm>).

The Agile approach to rapid iterations, when executed with appropriate discipline and measurement, promotes on-going refinement of lifecycle cost estimates. In addition, tactical choices made by development teams can be more directly tied to strategic needs of the enterprise that drive system architecture, design of high-value functionality, lifecycle costs, and deployment timelines.

COMMITTEE ON WAYS AND MEANS

U.S. HOUSE OF REPRESENTATIVES

WASHINGTON, DC 20515

August 5, 2016

Mr. Robert Klopp
Chief Information Officer
Social Security Administration
6401 Security Boulevard
Woodlawn, MD 21207

Dear Mr. Klopp,

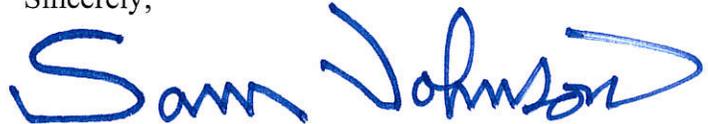
Thank you for your testimony before the Committee on Ways and Means Subcommittee on Social Security at the July 14, 2016 hearing on “Modernizing Social Security’s Information Technology Infrastructure.” In order to complete our hearing record, we would appreciate your responses to the following questions:

1. How will the SSA ensure that the Information Technology (IT) modernization plan that the SSA has outlined doesn’t change course with subsequent changes in leadership?
2. Mr. Warsinskey testified at length about system outages, lag time, and bandwidth issues that cost the SSA work hours and lengthen wait times for the public. How will modernization address these concerns? In the interim, what is the SSA doing to fix this?
3. Part of the IT modernization plan involves the use of Agile IT development methods that require working with end users which would include front service employees in the field. How is the Office of Systems collaborating with the Office of Operations to engage with end users?
4. The OMB Circular A-130 requires Federal agencies to conduct an alternatives analysis prior to making an IT investment that includes the consideration of commercially available options. Has the SSA conducted a Commercial-Off-The-Shelf (COTS) alternatives analysis for its IT modernization needs?
5. Given that technology can change over the course of an IT development project, and new COTS alternatives that didn’t exist at the outset of a project may become available, how does the SSA ensure this analysis stays current? How do you determine if a new COTS product is available once a project is underway?

We would appreciate your responses to these questions by **August 18, 2016**. Please send your response to the attention of Amy Shuart, Staff Director, Subcommittee on Social Security, Committee on Ways and Means, U.S. House of Representatives, B-317 Rayburn House Office Building, Washington, DC 20515. In addition to a hard copy, please submit an electronic copy of your response in Microsoft Word format to mm.russell@mail.house.gov.

Thank you for taking the time to answer these questions for the record. If you have any questions concerning this request, you may reach Amy at (202) 225-9263.

Sincerely,

A handwritten signature in blue ink that reads "Sam Johnson". The signature is written in a cursive style with a large, sweeping "S" and a long, horizontal flourish at the end.

Sam Johnson
Chairman
Subcommittee on Social Security

House Committee on Ways and Means Subcommittee on Social Security
Modernizing Social Security's Information Technology Infrastructure

July 14, 2016

**Questions for the Record for Chief Information Officer Robert Klopp
from Chairman Sam Johnson**

- 1. How will the SSA ensure that the Information Technology (IT) modernization plan that the SSA has outlined doesn't change course with subsequent changes in leadership?**

Areas requiring modernization (structured code and databases, updated infrastructure utilizing modern techniques, and languages and tools) have progressed from the conceptual to detailed plan phase. We have developed clearly outlined executable project plans and begun several initiatives – such as Amazon web services development and modern data warehousing. We will also continue with the progress made to date in modernizing our vast databases and data analytics capabilities.

Training hundreds of staff in modern applications and tools is progressing via a number of means including intensive boot camps and consultative engagements. Dual emphasis is made on acquiring modern languages and tools (i.e., Hadoop and Node.js) and effectively structuring code and data.

Career employees (rather than appointees), such as the Chief Technology Officer and Assistant Deputy Commissioners, are at the forefront of modernization plan execution. Continuity at this level will ensure that we remain on track. The modernization course of action is set and we are making good progress. At the levels proposed in both the FY 2017 House and Senate marks, the IT modernization projects will not start in FY 2017 and will be delayed another year causing delays in these important plans.

- 2. Mr. Warsinskey testified at length about system outages, lag time, and bandwidth issues that cost the SSA work hours and lengthen wait times for the public. How will modernization address these concerns? In the interim, what is the SSA doing to fix this?**

The issues Mr. Warsinskey raised were related to the agency's Wide Area Network (WAN) and SSANet - the foundation for the digital platform: bandwidth, integrated data and voice communications, video teleconferencing, wireless infrastructure, mobile device management, and secure logical and physical access. We will solve each of the listed concerns in the short and long term by measures to increase the size/capacity and speed/throughout the SSA network through our Quantum Leap Transition Project. Quantum Leap is centered on consolidating, leveraging, and optimizing SSANet bandwidth to 100 Megabits per second (Mbps) connectivity, which facilitates data

sharing, streamlines communications, and optimizes network investments by our agency. This upgrade will deliver from 3X to 100X speed improvements to resolve the issues.

- 3. Part of the IT modernization plan involves the use of Agile IT development methods that require working with end users which would include front service employees in the field. How is the Office of Systems collaborating with the Office of Operations to engage with end users?**

Our Office of Systems recently reorganized to address this very issue. The Office of IT Business Support is an Assistant Deputy Commissioner level office focused on understanding the precise needs of our internal and external customers and effectively translating them into the IT products we deliver. Hundreds of business analysts engage directly with end users and stakeholders continually throughout the development process to ensure each incremental production release meets the user's intended needs and expectations. This portion of the reorganization was designed *specifically* to improve the ability of Systems to interact with the Office of Operations and our other major operational component, the Office of Disability Adjudication and Review.

- 4. The OMB Circular A-130 requires Federal agencies to conduct an alternatives analysis prior to making an IT investment that includes the consideration of commercially available options. Has the SSA conducted a Commercial-Off-The-Shelf (COTS) alternatives analysis for its IT modernization needs?**

We conducted our IT Modernization Major IT Program level alternatives analysis based on various levels of funding, timeframes and wholesale versus piecemeal approaches. Elements comprising the entire program go through a series of make versus buy analyses.

First, our IT investment review process develops business cases that require COTS solution examinations. Our Enterprise Architecture team helps develop proposed IT initiative businesses cases and, in doing so, considers COTS as part of the technical approach. Our Enterprise Architecture team also engages with project release teams early enough in the life cycle to ensure it analyzes COTS solutions. Our Architecture Review Board has a responsibility to identify and consider applicable COTS solutions.

In addition, when feasible, we conduct proofs of concepts to test the viability and functionality of commercial offerings. For example, prior to continuing in-house development of the Disability Case Processing System, we hired a contractor to perform a proof of concept on the COTS solution. Further, we recently concluded a very comprehensive multi-year evaluation of a COTS solution to support the delivery of notices to the public.

- 5. Given that technology can change over the course of an IT development project, and new COTS alternatives that didn't exist at the outset of a project may become available, how does the SSA ensure this analysis stays current? How do you determine if a new COTS product is available once a project is underway?**

Our Chief Technology Officer and his staff continually learn about and assess new technologies through multiple means, including regular engagement with the Federal CIO Council and members, constant dialogue with our business partners and leading edge technology firms, frequent interactions with Gartner and other leading IT research firms, and emerging technology forums and conferences.

Our assessment of COTS products is founded on finding value in buying software instead of building it. However, purchased software must follow the same tenets as build efforts: it should scale, run on commodity hardware, and be written in or at least be customized using common open programming languages. It should be extensible from the outside such that all functionality is available to custom programs as callable services. Inflight COTS alternatives are measured against remaining build efforts, rather than total build costs. Sunk costs are not considered, in accordance with best industry practices.