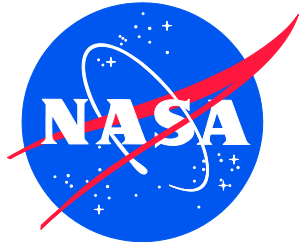


NASA/TM-20240010785



NASA Agile Community of Practice 2023-2024 Report

*Jackelynn Silva-Martinez
Johnson Space Center, Houston, Texas*

*Alex Desharnais
Jet Propulsion Laboratory, Pasadena, California*

August 2024

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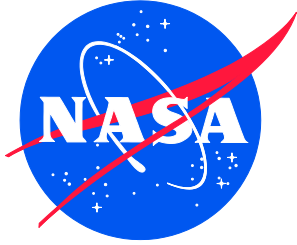
- Access the NASA STI program home page at <http://www.sti.nasa.gov>

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NASA Agile Community of Practice 2023-2024 Report

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National Aeronautics and
Space Administration

Langley Research Center
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August 2024

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NASA Agile Community of Practice

2023-2024 Report

Abstract

This 2023-2024 report provides a comprehensive summary of the products and activities executed by the NASA Agile Community of Practice over its first year from being formally stood up. The report highlights the community's ongoing efforts to advance Agile values and principles, improve practices, and foster innovation within teams across NASA centers. The report delves into key initiatives, including the development of a strategic plan, executive summary, and best practice guidelines; as well as the facilitation of knowledge-sharing events such as webinars with internal and external speakers, workshops, and technical interchange meeting. It also examines the impact of these activities on organizational agility, team performance, and overall product success through case studies, feedback from community members, and metrics. This shows the community's role in driving continuous improvement and supporting the broader adoption of Agile principles across NASA.

Purpose

The purpose of this community is to exchange knowledge, experience, and ideas among Agile practitioners across the Agency, and help new adopters in their Agile transformations.

NASA Agile CoP Leadership Team

Name	CoP Role
Jackelyne Silva-Martinez	NASA Agile CoP Lead, Webinars Lead, TIM Lead
Alex Desharnais	CoP Deputy, JPL Rep, Guidelines Lead, TIM Committee
Daniel Hoffpauir	Communications Lead, TIM & Metrics Committees
Paul Liu	ARC Rep, TIM Committee
David Swartwout	JSC Rep, Executive Summary Lead
Scott Tashakkor	MSFC Rep, Software TDT Rep
Chris Edwards	LaRC Rep, Getting Started with Agile Lead
Marian Cronin	GRC Rep, TIM Committee

Aaron Comis, Heather Livingston	GSFC Reps, Digital Engineering Liaison
Jeanette Le, John Baca	AFRC Reps, TIM & Executive Summary Committees
Caren Ensey	KSC Rep, TIM & Executive Summary Committees
Alex Elliot	SSC Rep, TIM & Executive Summary Committees
Shenandoah Speers	HQ Rep, TIM Committee, OCIO-NPR-NASA2040 Liaison
Denise Amling	HQ Rep, Training & Metrics Lead, TIM Committee
Amit Patel	Electro-Mechanical Systems Lead, TIM Committee
Chris Munk, Kasey Phillips	Getting Started with Agile Committee

Products

Product	Delivery Month	Status
Charter	July 2023	Complete
Agile CoP Website: NEN Site	Aug 2023	Complete
Agile CoP Teams Channel	Aug 2023	Complete
Results from NASA Agile Teams Study	Oct 2023	Complete
Webinars	Ongoing	In Progress
Agile CoP Branding and Templates	Jan 2024	Complete
Agile Guidelines	Jan 2024	Complete
Strategic Plan - Playbook	April 2024	Complete
Executive Summary	May 2024	Complete
Agile Technical Interchange Meeting	May 2024	Complete
Agile CoP Report (First Year)	Aug 2024	Complete
Metrics	Ongoing	In Progress
Getting Started with Agile	Ongoing	In Progress
Recommendations for NPR Updates	Ongoing	In Progress

Charter

The Agile CoP Charter established the CoP's functions, membership, participation expectations, assessments, and records dispositions. The charter was applicable to all NASA centers including component facilities. The CoP efforts apply to technical and business areas, mission and mission support, hardware and software projects, from research to flight projects, and at any phase in the lifecycle. The charter was developed with inputs from the CoP Leadership team and effective in July 2023.

Link to charter: [Agile CoP Charter](#)

NASA AGILE COMMUNITY OF PRACTICE CHARTER**1. PURPOSE**

- a. This charter establishes the NASA Agile Community of Practice (CoP) and sets forth the CoP's functions, membership, participation expectations, assessments, and records disposition.
- b. The NASA Agile CoP is an Agency-wide forum established by the NASA Engineering & Safety Center (NESC).

2. APPLICABILITY

This charter is applicable to all NASA Centers including Component Facilities. The CoP efforts apply to technical and business areas, mission and mission support, hardware and software projects, from research to flight projects, and at any phase in the lifecycle.

3. FUNCTIONS

- a. The NASA Agile CoP provides a forum to exchange knowledge, experience, and ideas among Agile practitioners across the Agency.
- b. The NASA Agile CoP develops best practices and recommendations to support teams across the Agency in their Agile efforts.
- b. The NASA Agile CoP provides resources to help new adopters in their Agile transformations.
- c. The NASA Agile CoP efforts focus on the increase the Agile capability in the NASA workforce.

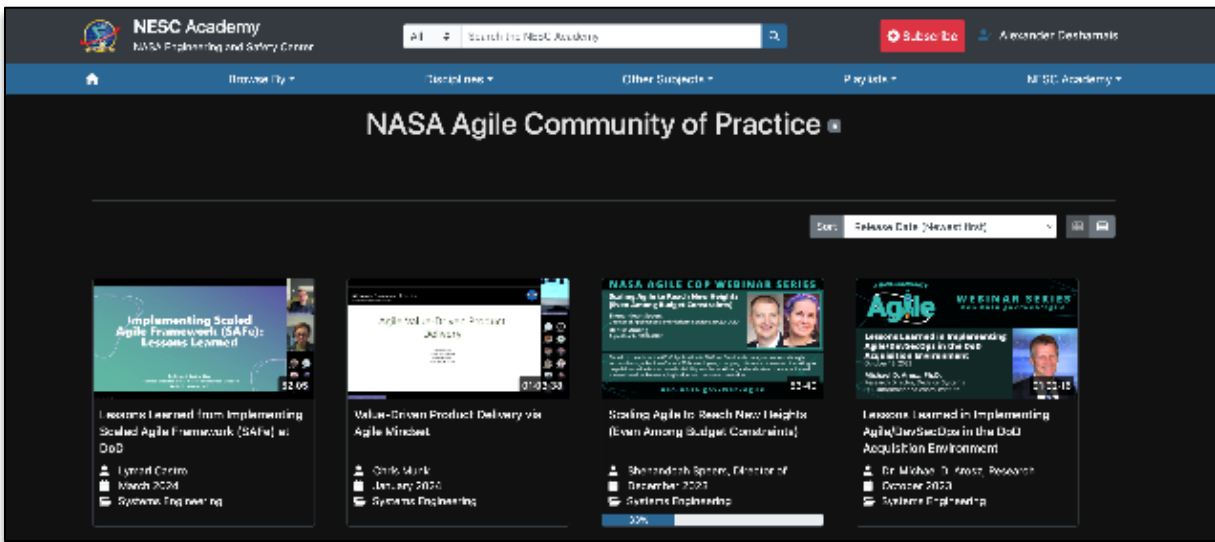
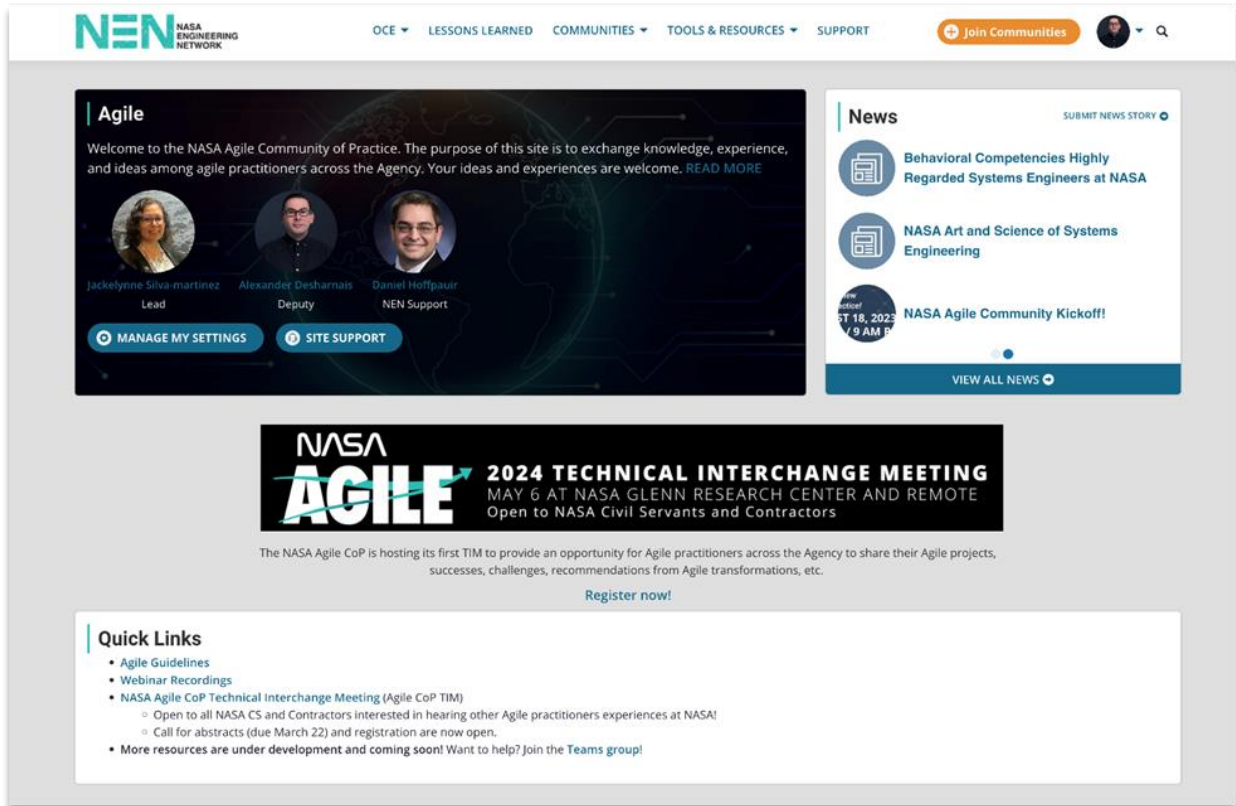
4. MEMBERSHIP

- a. The NASA Agile CoP Leadership Team is composed of the NASA Agile CoP Lead, CoP Deputy, and CoP Agile Team.

Agile CoP Website

The CoP hosts its website under the NASA Engineering, known as NEN Site. The NESC provides technical support on the website, advertisement of CoP events, and editing and publishing of CoP Webinars in the NESC Academy. In addition to membership tracking and documents repository, the CoP has leveraged its use to collect metrics on the Agile roles and certifications are across the Agency, link to recorded webinars in the NESC Academy, and as abstracts and registration platform for the Agile Technical Interchange Meeting. The CoP has also coordinated with Satern on updates and additions of training material to the Digital Academy link available to all employees via Satern.

Link to website: <https://nen.nasa.gov/web/agile>



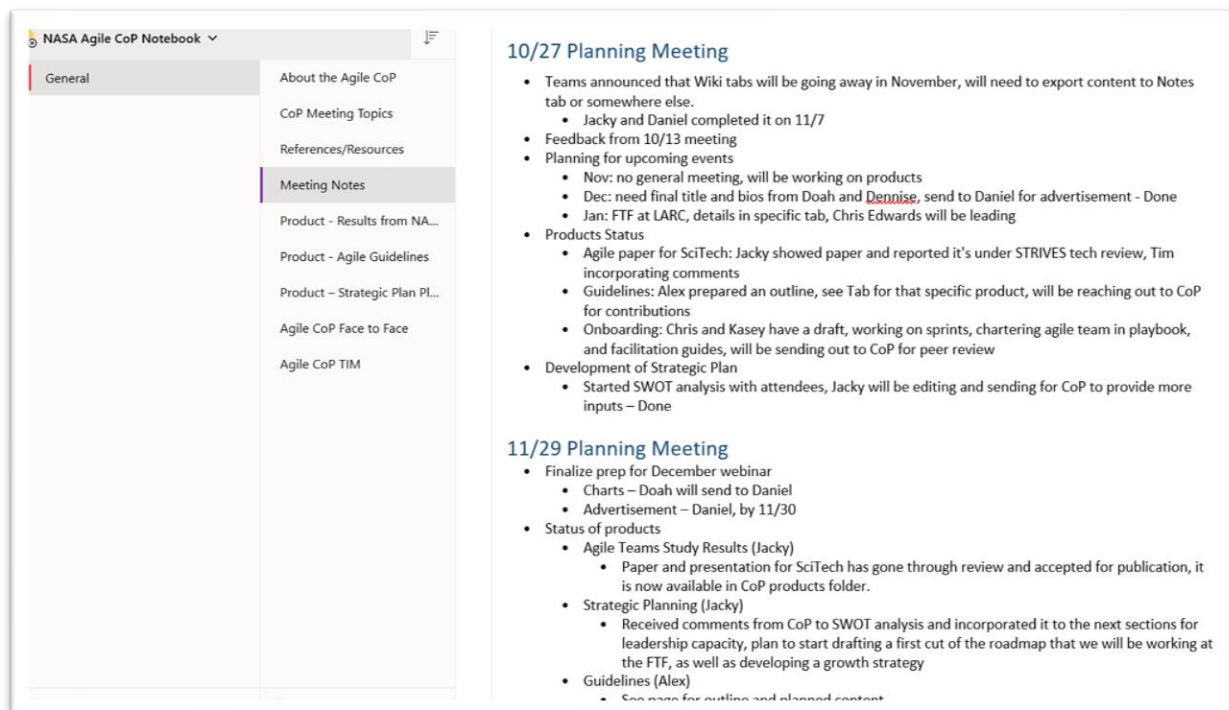
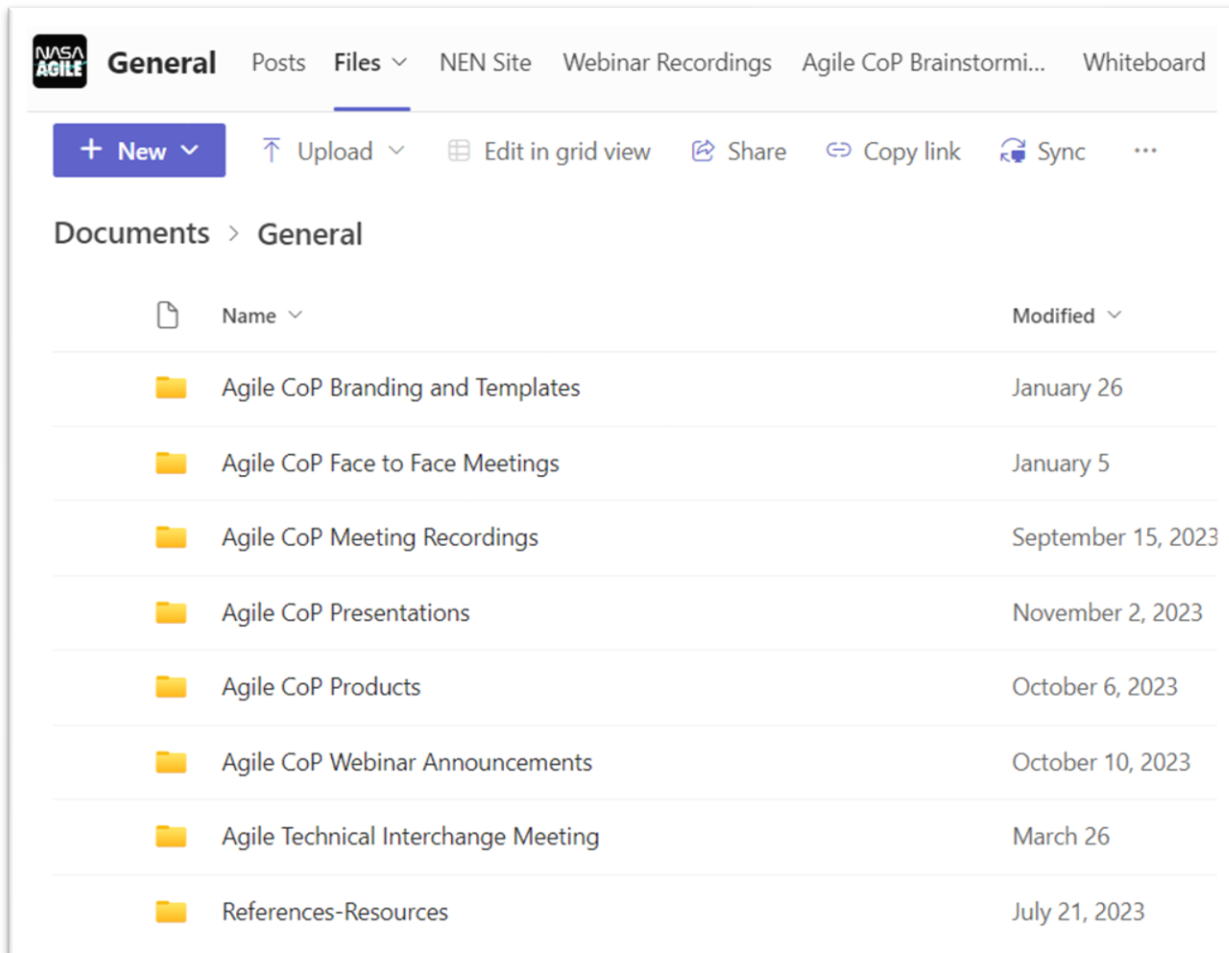
Agile CoP Teams Channel

The Agile CoP created a teams channel to use for collaboration and communication. Working products are developed and worked collaboratively in there. The channel has facilitated the exchange of information across the CoP. Members have been adding resources and references to existing materials, including the sharing of their own projects documents and presentations. Appendix # shows some of the references shared by the CoP.

The features used within teams include chat, structured files, notes, whiteboard, and planner. Microsoft Planner has been used to manage CoP tasks. Early in the year, JPL members and contractors without NASA email addresses had some limitations accessing all the features within Teams. Thanks to the latest OCIO updates, collaboration with JPL became more functional.

The teams channel chat has been useful for communication of inputs requests, advertising of events, and published products announcements.

Link to teams channel: [NASA Agile CoP | General | Microsoft Teams](#)



Results from NASA Agile Teams Study Conference Paper

Following on the study performed from NASA agile teams, results were summarized in a conference paper and presented at the AIAA SciTech 2024. Results showed a consistent framing of agile as incremental knowledge growth, a way of showing progress, and as the incorporation of frequent customer feedback. The paper provided details of the interview responses gathered in the study and suggested actions for NASA to become more agile.

Link to paper:

https://ntrs.nasa.gov/api/citations/20230014877/downloads/AIAA%20SciTech%20-%20Agile%20Teams%20Results_Revised.pdf

Results & Discussion

- Consistent framing of agile as incremental knowledge growth, a way of showing progress, and the incorporation of frequent customer feedback.
- Participants emphasized a lack of a common understanding of agile across the Agency, which sometimes caused managers and engineers to be reluctant to accept and support them.

How Do You Define Agile?/Across All Sources

Definition	Percentage
Incremental knowledge growth or product development	57%
Incorporates constant and frequent customer feedback	20%
Can respond in a timely fashion to changes in requirements	24%
Making my team efficient, self-directing and high performing	18%
A mindset switch between waterfall and agile	7%
Following the Agile Manifesto	1%

Describe Your Work Environment That Allowed Agile To Be Fostered Instead of Previous Traditional Methods/Across All Sources

Work Environment	Percentage
Buy in and support from management, stakeholders and the team	73%
Team has been given a lot of autonomy/flexibility	20%
Its very collaborative	13%
We were all co-located	10%
Openness to on-line collaboration	10%

6

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Agile CoP Branding and Templates

Ideas from the community were gathered to come up with a CoP logo. After some iterations made based on feedback to a couple of options, and with the support of a graphic designer, a logo was developed for the Agile CoP, which has been used in presentations and products.

Similarly, presentation templates were created using the CoP logo as well as links to the website and Teams channel. These templates were also used in the Agile TIM presentations.

Link to logos and templates: [Agile CoP Branding and Templates](#)



Agile Guidelines

A handout was created providing Agile principles and practices that can be applied in NASA projects. These were developed based on values and principles from the Agile manifesto, inputs and feedback from the CoP. This handout also contains quick focus and key features of the most used Agile frameworks and methodologies.

Link to guidelines: https://nen.nasa.gov/web/agile/documents/-/document_library/h5fjYiGhs1eZ/view_file/43096775?_com_liferay_document_library_web_portlet_INSTANCE_h5fjYiGhs1eZ_redirect=https%3A%2F%2Fnen.nasa.gov%3A443%2Fweb%2Fagile%2Fdocuments%3Fp_p_id%3Dcom_liferay_document_library_web_portlet_DLPortlet_INSTANCE_h5fjYiGhs1eZ%26p_p_lifecycle%3D0%26p_p_state%3Dnormal%26p_p_mode%3Dview

AGILE
NASA Community of Practice
Educate • Collaborate • Innovate

National Aeronautics and Space Administration
AGILE GUIDELINES
Principles, Practices, Frameworks & Methodologies

Principles

Embrace Change	Deliver Value Early and Often	Collaborate with Stakeholders	Empower Teams	Measure and Learn
Be flexible and adaptable. Welcome change as an opportunity to improve by continuously adapting their plans based on feedback.	Break down work into small, manageable chunks and deliver working software frequently to meet the needs of the customer.	Work with stakeholders to communicate regularly about your progress and plans. This will help to ensure they are aligned with your goals.	An agile team is self-organizing, self-managing, and has the authority to make decisions to achieve shared goals.	Regularly measure and reflect on progress. Learn from mistakes and make frequent process adjustments as needed.

Practices

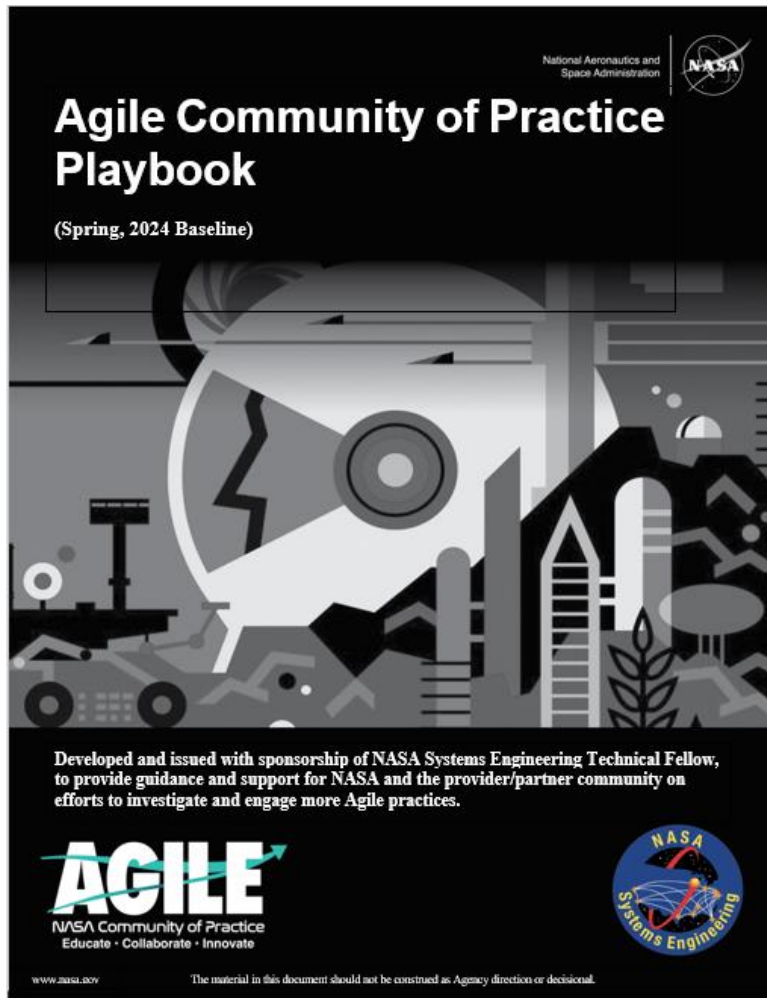
- Iterative and Incremental Development:** Work in short iterations or increments to establish feedback loops in order to develop and deliver value.
- Collaborative Approach:** Emphasize collaboration and communication within the project or team to infuse transparency and psychological safety.
- Cross-Functional Teams:** Work collaboratively in a cross-functional team. Share knowledge and skills to achieve shared-goals.
- Customer Involvement:** Involve customers and stakeholders throughout the development process. Gather and prioritize feedback to adapt to changing requirements.
- Adaptive Planning:** Adapt and refine plans as changes in requirements or new information becomes available during each iteration.
- Continuous Improvement:** Foster a culture of continuous learning and improvement. Reflect on the previous iteration, what went well, and adjust processes to improve efficiency.
- Quality Accountability:** Build quality into the product from the start. Use testing and other techniques to ensure deliverables meet quality.
- Prioritization:** Maintain a prioritized value-driven backlog.
- Transparency:** Use information radiators to visualize and communicate progress, plans to stakeholders. Share information about challenges and decision-making.
- Risk Reduction:** Identify, prioritize, and address (communicate/elevate) potential risks as early as possible. Mitigate risks through iterative development and frequent feedback loops.

www.nasa.gov
nen.nasa.gov/web/agile

Agile CoP Playbook

This product contains the mission, vision, and values of the CoP. A strengths, weaknesses, opportunities, and threats analysis, along with leadership capacity and a roadmap for the Agile transformation efforts including short-term and long-term objectives and strategies.


Link to playbook: https://nen.nasa.gov/web/agile/documents/-/document_library/h5fJYiGhs1eZ/view_file/44898967?_com_liferay_document_library_web_portlet_DLPortlet_INSTANCE_h5fJYiGhs1eZ_redirect=https%3A%2F%2Fnen.nasa.gov%3A443%2Fweb%2Fagile%2Fdocuments%3Fp_p_id%3Dcom_liferay_document_library_web_portlet_DLPortlet_INSTANCE_h5fJYiGhs1eZ%26p_p_lifecycle%3D0%26p_p_state%3Dnormal%26p_p_mode%3Dview




Executive Summary

This power point presentation provides a high level explanation and key points of Agile, comparison with the traditional approach, when Agile should and should not be used, and CoP efforts. The product was developed to help the CoP and new adapters to communicate with their management, teams, and projects/programs about Agile.

Link to charts: https://nen.nasa.gov/web/agile/documents/-/document_library/h5fJYiGhs1eZ/view_file/44898948?_com_liferay_document_library_web_portlet_DLPportlet_INSTANCE_h5fJYiGhs1eZ_redirect=https%3A%2F%2Fnen.nasa.gov%3A443%2Fweb%2Fagile%2Fdocuments%3Fp_p_id%3Dcom_liferay_document_library_web_portlet_DLPportlet_INSTANCE_h5fJYiGhs1eZ%26p_p_lifecycle%3D0%26p_p_state%3Dnormal%26p_p_mode%3Dview



Traditional vs Agile Workflow



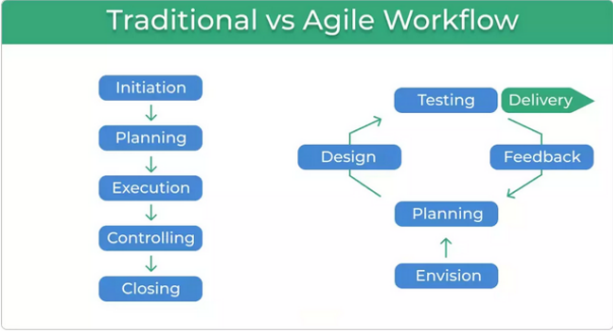
Traditional

- Traditional workflow is managed in a sequential, linear way known as the “waterfall” approach.
- Issues occur when a change of requirements or new request emerges (scope creep).
- During “scope creeps”, teams go through lengthy change control processes, then go back, undo and redo some of the work, which contributes to enormous process delays and high costs.

Agile

- Agile workflow aims to relieve issues caused by “scope creeps” by focusing on continuously delivering small pieces of work to the end customers and getting their feedback as soon as possible.
- By getting customer feedback as soon as possible, teams can adapt easier to emerging changes.

Traditional vs Agile Workflow



Benefits of Agile

- Transparency
- Adaptability
- Improved Team Collaboration

nen.nasa.gov/web/AGILE 3

Agile Face to Face Leadership Meeting

Logistics

Lead: Chris Edwards

Location: LARC B2102, Rooms 262-263

Dates: January 16-19, 2024

Agenda

Tuesday, January 16

- (AM) Travel time
- (3:00PM) Meet & Greet, LARC B2102
- (5:00PM) Dinner: Vanguard (504 N King St, Hampton)

Wednesday, January 17

- (8:30AM) Welcome – LaRC Associate Director for Technology, Kevin Rivers
- (8:45AM) LaRC History - Chris Edwards
- (9:00AM) Agile involvement and challenges - All participants
- (10:30AM) Mission and Vision
- (11:30AM) Values (Revise latest version of **Agile Guidelines** based on feedback received from CoP)
- (12:15) Lunch: Cafeteria available on first floor
- (1:00PM) SWOT Analysis
- (3:00PM) Tour of B1148 Structures and Materials Lab, Habitats and Robotics
- (3:45PM) Leadership Capacity
- (5:00PM) Wrap-up
- Social (optional): Afterburners (Open 4-7)

Thursday, January 18

- (8:00AM) Finalize Leadership Capacity
- (9:00AM) Goals for Organizational Capacity & Roadmap for Agile at NASA
- (11:30 AM) Tour of B1212 14X22 wind tunnel 301
- (12:00) Lunch: Cafeteria available on first floor
- (1:00PM) Onboarding: Getting Started with Agile - Chris Munk, Ramel Panaguition, Kasey Phillips

(Review/Finalize Getting Started with Agile Project Transition Playbook)

- (3:45PM) Compare content from **Agile Guidelines** against the **Onboarding Playbook** content to ensure they link to each other but don't repeat/contradict information - Alex
- (5:00PM) Wrap-up
- Tour (optional): B2104 measurement system lab (1hr)
- Social (optional): Afterburners (Open 4-7)

Friday, January 19

- (8:00AM) Open Agile Topics (~30' each):
 - CoP Logo – Daniel Hoffpauir
 - Metrics - Denise Amling
 - SLS – Scott Tashakkor
 - CoP roles & products (leads and dates)
- (10:00AM) Agile TIM Agenda discussion

- (11:00AM) Review of FTF actions
- (11:30AM) Transfer to Pearl Young Theater
- (11:45AM) Group Photo at Pearl Young Theater Stage
- (12:00PM) Agile CoP Seminar & Webinar: Value Delivery and Mindset
 - Presenters: Chris Munk, Kasey Phillips, and Ramel Panaguiton
 - Location: LaRC Pearl Young Theater
- (PM) Travel back to home sites

Attendees

- Alex Desharnais
- Alex Elliot
- Caren Ensey
- Chris Edwards
- Chris Munk
- Daniel Hoffpauir
- David Swartwout
- Denise Amling
- Jackelynne Silva-Martinez
- Jeanette Le
- John Baca
- Jon Holladay
- Kasey Phillips
- Mary Beth Wusk
- Paul Liu
- Scott Tashakkor
- Shenandoah Speers
- Ramel Panaguiton

Agile Face to Face Meeting Summary

Day 1 - Wednesday, Jan 17th, 2024

Chris Edwards introduced the Associate Center Director For Technical at Langley who presented on Langley's capabilities and their adoption of agile methods. He emphasized Langley's unique position as a pioneer for experimenting with and implementing new methods across NASA. This includes not just software development but also hardware development and technology demonstrations.

Chris Edwards provided a historical perspective on Langley highlighting its significant milestones. He shared that Langley is the oldest NASA center boasting over 100 years of experience. Furthermore, Langley holds the distinction of employing Katherine Johnson, a mathematical genius instrumental in the success of early NASA missions.

Edwards elaborated on Langley's facilities, describing how the center is divided into East and West sections. The East side situated on the grounds of the oldest operational Air Force Base in the world houses a variable density pressure tunnel. This historic facility played a key role in developing the foundational airfoil shapes that continue to be relevant in modern aviation.

This CoP discussed crafting a mission statement and vision statement for the NASA Agile community of practice (CoP) aiming to ensure the initiative goes beyond simply speeding up project completion. The focus is on using Agile methodologies to deliver the right products and make sound decisions.

- Proposes a mission statement that emphasizes infusing Agile values and principles into NASA projects.
- The key question becomes how to phrase the mission statement in a way that avoids defensiveness and encourages a cultural shift within NASA. Chris Munk cautioned against language that implies the existing culture is flawed suggesting a more opportunity-oriented approach that highlights the benefits Agile can bring.
- To achieve this, they brainstorm and refine the wording to focus on supporting NASA in successful project delivery through Agile practices. This reframes Agile as a tool for improvement not a replacement for existing structures.
- The concept of a vision statement is also introduced. It should articulate the desired future state for the CoP without getting too tactical. Here, the focus is on the long-term goals and impact the CoP aims to achieve.
- Chris Munk emphasized the importance of the "why" behind the mission. He underscored that ensuring Agile is used to deliver the right products, not just complete projects faster is a critical distinction. This ensures the CoP is driving value and meeting customer needs.

Overall, the discussion unpacked the complexities of crafting clear and concise statements that motivate and guide the NASA Agile CoP. It goes beyond simply defining what Agile is to how it can be adopted within NASA to achieve successful mission outcomes.

Day 2 - Thursday, Jan 18th, 2024

Kasey Philips introduced an Agile project transition playbook specifically designed for NASA employees. The playbook aims to streamline the process of adopting Agile methodologies within the agency. Here are some key takeaways:

- **Targeted Content:** The playbook skips in-depth explanations of Agile fundamentals, instead focusing on its applicability within NASA's specific context. It serves as a springboard for teams to decide if Agile is a suitable approach for their projects and provides initial steps to get them started.
- **Decision-Making Support:** A flowchart included in the playbook acts as a guide for teams, helping them assess if Agile is a good fit for their project needs.
- **Focus on Usability:** Recognizing the busy schedules of NASA employees, the playbook is designed to be concise and user-friendly. It prioritizes key information delivery to avoid overwhelming users with extensive details.
- **Actionable Steps:** The focus is on providing practical guidance. The playbook outlines the core principles and values of Agile, along with initial steps for implementation within NASA projects.
- **Expanded Learning:** The playbook acknowledges that it's not an exhaustive resource. It integrates references to other materials for further exploration of Agile concepts.
- **Addressing Specific Terminology:** The speaker recognizes the presence of Langley-specific terminology within the playbook and plans to elaborate on the reasoning behind it in the future.

The content was broken down into several key areas for the audience to understand:

- **Target Audience and Value Delivery:** The speaker clarifies who the playbook is intended for and emphasizes the concept of value delivered throughout the project.
- **Desired Outcomes and Agile Practices:** They delve into managing projects with a focus on achieving the specific desired outcome. The presentation aims to provide a foundational understanding of Agile practices without getting bogged down in specific terminology like Scrum or Kanban.

- Scrum vs. Kanban: A key distinction is made between Scrum, which uses fixed-length iterations with limited scope changes, and Kanban, a more flow-based approach that can accommodate unplanned work.
- Handling Unplanned Work: The speaker acknowledges that unplanned work is a reality and offers strategies to manage it, such as reserving some capacity for these eventualities.

Overall, Kasey set the stage for a deeper dive into Agile project management concepts, highlighting the playbook's role in guiding users through the process.

Day 3 - Friday, Jan 19th, 2024

Denise facilitated a discussion about the purpose and value of the NASA Agile Community of Practice. Here's a more detailed breakdown of the conversation:

Agile CoP's goals:

- Foster knowledge sharing and experience exchange among Agile practitioners across NASA.
- Assist new adopters and guide Agile transformations within the agency.
- Promote Agile principles and values to enhance project delivery and value creation.

Brainstorming session to identify the value the Agile CoP can provide to NASA. Here are the ideas that emerged:

- Improved project outcomes: Successful project completion, faster turnaround times, and early detection of potential roadblocks were all mentioned as ways the CoP could contribute to better project outcomes.
- Enhanced collaboration and knowledge sharing: The group acknowledged the potential benefit of increased collaboration and cross-functional communication across different departments at NASA. Sharing knowledge about existing Agile initiatives and identifying teams that are already using Agile could streamline these efforts.
- Improved communication and outreach: Establishing a common voice for Agile implementation and fostering better interaction with industry partners were identified as ways to strengthen communication and outreach efforts.
- Empowering new adopters: Recognized the need to support new adopters by providing educational and outreach opportunities to help them learn more about Agile practices.
- Reduced bureaucratic hurdles: While the specific wording wasn't mentioned, the idea of streamlining processes and reducing bureaucratic obstacles that might hinder Agile adoption was also discussed.

Overall, the brainstorming session highlighted the CoP's potential to contribute to a more collaborative, efficient, and Agile way of working at NASA ultimately leading to better project outcomes and increased value delivered.

Scott Tashakkor gave a presentation and a more detailed explanation of the challenges of implementing Agile development at NASA:

Traditional Waterfall vs Agile:

NASA's software development traditionally follows a waterfall model, with meticulously defined phases like requirements gathering, design, development, testing, and deployment. Each phase is completed sequentially, with strict milestones and signoffs before moving to the next. This approach ensures stability and predictability, crucial for high-risk space missions.

Agile, on the other hand, is an iterative and flexible methodology. Software is developed in short sprints (typically 2-4 weeks) with continuous integration and testing. Requirements can evolve throughout the process based on constant customer feedback and new learnings. This fosters adaptability and a quicker response to changing needs but introduces uncertainty into the typically rigid planning cycles at NASA.

Challenges for Agile Implementation at NASA:

- **Safety-Critical Systems:** NASA's top priority is mission success and crew safety. Deviations from a well-defined plan due to changing requirements raise concerns. Agile's emphasis on flexibility can be at odds with the rigorous testing and verification procedures for safety-critical software on spacecraft.
- **Fixed-Cost Contracts:** Many NASA projects operate under fixed-cost contracts. The unpredictable nature of Agile development, where the scope and timeline might evolve, makes it difficult to estimate costs accurately upfront. This can lead to budget issues and contract disputes.
- **Geographically Distributed Teams:** NASA's workforce is spread across various locations. Agile methodologies often thrive on close collaboration and daily stand-up meetings, which can be challenging to conduct effectively with geographically dispersed teams.

Agile Success Stories and Adaptations:

While implementing Agile across the board proves difficult, some projects have found success with adaptations:

- **Smaller Projects:** Smaller, less complex projects can benefit more from Agile's flexibility. Teams can adapt the methodology to their specific needs, focusing on core principles like iterative development and continuous feedback, while maintaining a level of planning and documentation necessary for oversight.
- **Infrastructure Projects:** Projects with a well-defined scope, like internal IT infrastructure upgrades, are more suited for Agile since they resemble traditional IT projects with fixed timeframes and deliverables.

In conclusion, Agile development offers advantages for some projects at NASA, particularly those that are less complex and have more flexibility in scope and budget. However, significant hurdles related to safety, cost control, and team structure need to be addressed for widespread adoption. Finding the right balance between the adaptability of Agile and the rigorous planning required for space missions is an ongoing challenge for NASA.

Actions from Agile CoP Face to Face Meeting

1. Create a survey to learn who are certified Agile Coaches, certified trainers, practitioners across the Agency
 - **Who:** Daniel (Denise will provide options to add to Agile certifications/training in NEN site)
 - **Due:** 5/6
2. Make a list of Agile tools used/approved, with guidance on in what case(s) is better to use them
 - Guidance part is in Agile Guidelines and Playbook
 - List of tools can be created out of the same survey discussed in Action 1
 - **Who:** Daniel
 - **Due:** 5/6
3. Meet with Technical Authorities about their support for Agile CoP efforts (need to understand their involvement level and whether we specify TAs in the leadership capacity part of the strategic plan)
 - Quality is under OSMA
 - **Who:** Jacky, Alex D, John H

- **Due:** Feb 8
4. Meet with NASA Chief Program Management Officer, to ensure he is ok with the role we added in the leadership capacity part of the strategic plan
 - **Who:** John Holladay, Jacky, Alex D
 - **Due:** Feb 8
 5. Involve SMD into Agile CoP efforts
 - **Who:** Chris Edwards
 - **Due:** Feb 16
 6. Find out how to incorporate Agile to AOs
 - **Who:** Chris Edwards
 - **Due:** Feb 16
 7. Download transcripts of Agile FTF
 - **Who:** Daniel
 - **Due:** 1/31
 8. Develop minutes of Agile FTF
 - **Who:** Alex D
 - **Due:** 2/9
 9. FTF Retrospective
 - **Who:** Alex
 - **When:** 2/2 (as part of CoP planning meeting)
 10. Disseminate Agile CoP efforts to teams/directorates/centers/etc. (invite them to monthly CoP webinars, join CoP Teams channel, become CoP members through NEN site, once products are finalized-share, etc.)
 - **Who:** All Agile FTF Attendees
 - **Due:** Upon return to home centers
 11. Agile CoP logo - Incorporate comments received, send to CoP for a final review, and release
 - **Who:** Daniel
 - **Due:** 2/6
 12. Strategic Plan - Clean up various parts discussed during the FTF and integrate them into one product, send to CoP for a final review, and release
 - **Who:** Jacky
 - **Due:** end of Feb
 13. Getting Started with Agile - Incorporate comments received writing it as an Agency product, send to CoP for a final review, and release
 - **Who:** Kasey, Chris, Ramel
 - **Due:** end of March
 - Product development ongoing
 14. Guidelines - Incorporate comments received, send to CoP for a final review, and release
 - **Who:** Alex D
 - **Due:** 2/9
 - Turn into a handout - will work with NESC for formatting
 15. Executive Summary - Develop a presentation targeting management using other existing CoP products
 - Scott has a video that can be used as reference, Kasey and Alex also have some resources
 - **Who:** John Baca, Caren Ensey, Alex Elliot, Jeanette Le, David Swartwout
 - **Due:** end of March
 16. Find examples of flight hardware using Agile
 - a. **Who:** through Agile TIM
 - b. **Due:** May

Photos from Agile CoP Leadership Face to Face Meeting



Webinars

08/18/2023 - CoP Kickoff & NASA Agile Teams Study Results

The meeting began with the facilitator, Jackelynn Silva Martinez, welcoming everyone and introducing herself. She then asked the participants how they had heard about the community of practice and what their experience with agile was. The responses showed that the participants had a variety of levels of experience with agile, from those who were just learning about it to those who were certified scrum masters. The majority of the participants had heard about the meeting through email or the NASA Engineering Network website.

Silva Martinez then shared the results of a study she had conducted on agile teams at NASA. The study found that there was a need for more agile training and resources at the agency, as well as a need for better communication and collaboration between agile teams.

The facilitator then discussed the goals of the NASA Agile Community of Practice.

The goals are to:

- Provide a forum for NASA employees to learn about and share agile practices
- Help NASA teams adopt agile principles and methodologies
- Promote agile thinking and mindset across the agency

Silva Martinez then opened the floor for questions and discussion. The participants discussed a variety of topics, including the challenges of implementing agile in a large organization, the benefits of agile for hardware development, and the role of leadership in agile transformation.

The meeting kicked off with a discussion of the following questions:

- How did you hear about this community of practice?
- What is your experience with agile?
- What are you looking to get out of this community?
- What would you like to contribute to this community?

The meeting then covered the following topics:

- What is agile?
- The need for agile transformation
- The gaps in the literature on agile leadership
- The results of a study on agile teams leadership
- Recommendations for creating an agile leadership model at NASA

The study on agile teams leadership found that the following factors are important for successful agile leadership:

- A focus on continuous improvement
- A commitment to collaboration and teamwork
- The ability to adapt to change
- The ability to empower team members
- The study also found that there is no one-size-fits-all approach to agile leadership, and that the best approach will vary depending on the specific team and organization.

Based on the results of the study, Silva Martinez proposed a model for agile leadership. The model includes four key elements:

- Vision: Agile leaders must have a clear vision for the future and be able to communicate that vision to their team.
- Empowerment: Agile leaders must empower their team members to make decisions and take risks.
- Collaboration: Agile leaders must foster a collaborative environment where team members can work together effectively.
- Continuous learning: Agile leaders must be constantly learning and adapting to new ideas and technologies.

Here are some of the key takeaways from the meeting:

- There is a growing interest in agile at NASA.
- Agile can be a successful way to manage projects, but it requires strong leadership and a culture of continuous improvement.
- The NASA Agile Community of Practice can help NASA teams adopt agile practices and develop agile leaders.

Here are some additional details from the meeting:

- The meeting was attended by 98 people from across NASA.
- The participants represented a variety of disciplines, including software engineering, systems engineering, and human factors.
- The meeting was well-received by the participants, who expressed a strong interest in learning more about agile and how to apply it to their work.
- The NASA Agile Community of Practice will be hosted on the NASA Engineering Network website.
- The community of practice will have a Teams channel where members can ask questions and share resources.
- The community of practice will also host regular meetings and workshops.

The meeting concluded with Silva Martinez thanking the participants for their time and encouraging them to get involved in the community of practice.

Link to webinar: <https://nescacademy.nasa.gov/video/c120732f82eb455ca1c885065f42f0c81d>

NASA AGILE COMMUNITY KICKOFF



NASA is kicking off the new Agile Community of Practice!
FRIDAY, AUGUST 18, 2023
12 PM EASTERN / 9 AM PACIFIC

JOIN THE MEETING HERE:
[Join in Teams](#)

STAY IN THE LOOP:
Join our NEN site, open to all NASA CS/contractors with VPN access (including JPL), here:
<https://nen.nasa.gov/web/agile>

THEORETICAL IMPLICATIONS

Agile Leadership Model

Agile Leadership Characteristics

- ▶ Empowerment
- ▶ Clear definition of success
- ▶ Open communication and frequent feedback
- ▶ Comfortable with uncertainty

Outcomes from Agile Teams

- ▶ Increased value to the customer
- ▶ Transparent and collaborative environment
- ▶ Accountability and ownership
- ▶ Continuous learning

AGILE LEADERSHIP

When leaders empower their teams to deliver increasing value to their customers founded on clearly defined success criteria, open communication and frequent feedback; then a continuous learning mindset is developed in the teams' culture that allows them to be comfortable with uncertainty, be accountable and take ownership, within a transparent and collaborative environment.

Organizations can use the leadership characteristics found in this study for their **workforce development plan** in preparing their teams and leaders.

Organizations can **measure the success of their Agile transformation efforts** with the outcomes from Agile teams found in this study.

www.jackelynn.com

Silva-martinez, Jackelynn P. (JSC-SF211)

10/13/2023 - Lessons Learned in Implementing Agile in the DoD Acquisition Environment

In this conversation, Michael Arosz discussed his experience with implementing agile methodologies in the Department of Defense (DoD) acquisition environment. He mentioned several projects, including Project A (traditional waterfall), Project B (a hybrid of waterfall and agile), Project C (primarily for trade studies and preparation), and Project D (currently ongoing with a mix of agile and waterfall). Orosz highlighted the advantages of agile, including reduced bug reports during the final qualification testing phase and better adaptability.

He also shared challenges encountered in the agile approach, such as difficulties in estimating costs, managing feature spillover, understanding the balance of development and integration/testing within T-shirt sizing, and adapting to evolving requirements. Arosz emphasized the importance of early and frequent collaboration with stakeholders, including government contracting personnel, and the need for working groups to address evolving requirements and ConOps.

The conversation ended with recommendations, such as performing more upfront engineering for better project understanding, ensuring testing facilities are in place before development begins, and using model-based systems engineering for capturing corporate knowledge and training team members. Future steps include improving performance metrics collection and training and addressing cost escalation and lagging Earned Value Management (EVM) metrics.

Key points and recommendations from the discussion were as follows:

- 1. Challenges and spillage:** The primary challenge in Project D is the accumulation of unfinished features over time. This "spillage" is caused by factors like team members being pulled to other programs, delayed test facility availability, issues with intellectual property, and underestimating code complexity and system requirements.
- 2. Working groups and collaboration:** To address issues with stakeholder needs and evolving requirements, Orosz emphasizes the importance of frequent working groups and technical exchange meetings involving both the government and the prime contractor. Collaboration is key to ironing out the details and avoiding last-minute changes.
- 3. Roles like business analysts:** To address stakeholder needs, roles like business analysts and business relationship managers can be essential in facilitating communication and understanding between the development team and clients.
- 4. Transparency in t-shirt sizing:** Orosz discussed the challenge of using T-shirt sizing for estimating efforts, as it can hide details and inflate costs. He recommended improving transparency and granularity in the estimation process, distinguishing between development and integration/testing efforts.
- 5. EVM challenges:** Earned Value Management (EVM) lags behind Agile development cycles, making it difficult to track and report on project progress accurately. Finding more real-time metrics is recommended.
- 6. Front-loaded engineering:** Orosz suggested performing more upfront engineering to provide a foundation for project understanding and to identify complexities and dependencies early. This does not mean reverting to traditional waterfall-style documentation but ensuring a basic scaffolding is in place.
- 7. Near operational environment:** Establishing near-operational testing environments early in the project is vital for Agile projects to support continuous integration and testing.
- 8. Model-Based Systems Engineering (MBSE):** Increasing the use of MBSE can help capture corporate knowledge and improve understanding of complex systems. MBSE tools can also be used for training new team members.
- 9. Improving performance metrics:** Orosz discussed the need for better tools to communicate project success and challenges at the senior acquisition executive level. This would provide a higher-level perspective for decision-makers.
- 10. Lessons learned and manuals:** The need to continue collecting lessons learned and creating manuals with suggestions and recommendations for implementing and sustaining Agile methodologies in DoD acquisition projects.

Overall, the conversation highlighted the complexities and challenges of transitioning to Agile in the context of defense acquisitions and offers recommendations for addressing these challenges.

Link to Webinar: <https://nescacademy.nasa.gov/video/70c836b82c044274a46c6e58a43713a31d>



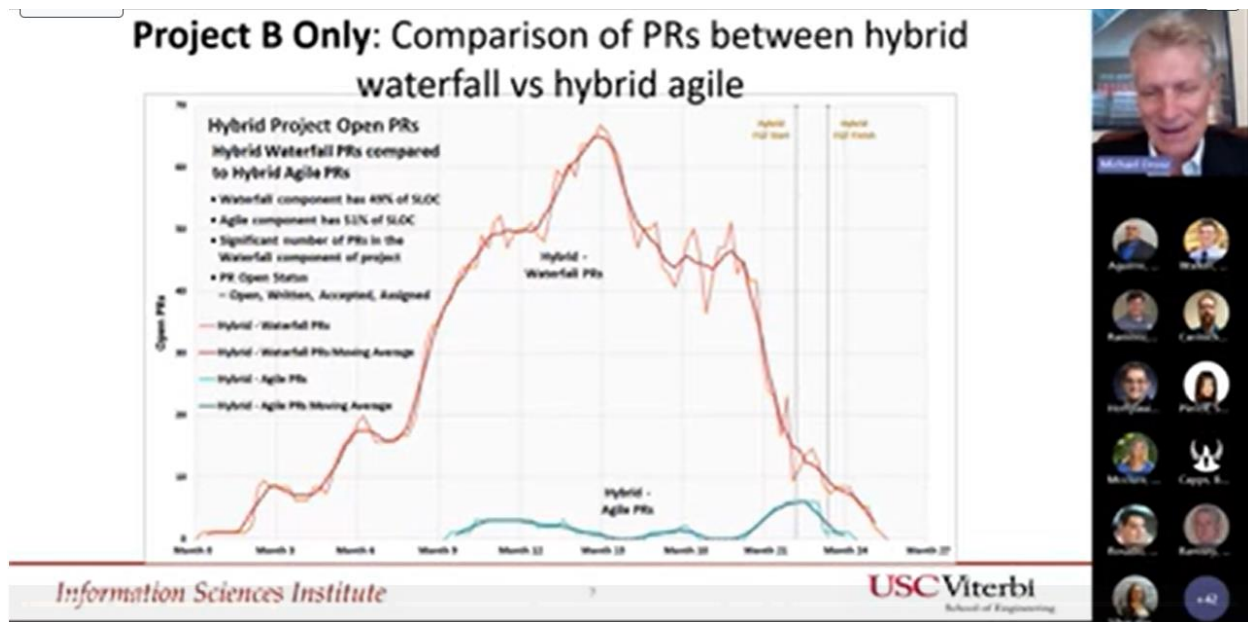
WEBINAR SERIES
nen.nasa.gov/web/agile

Lessons Learned in Implementing Agile/DevSecOps in the DoD Acquisition Environment

October 13, 2023

Michael D. Arosz, Ph.D.
Research Director, Decision Systems
USC Information Sciences Institute

Lessons Learned in Implementing Agile/DevSecOps in the DoD Acquisition Environment



12/8/2023 - Scaling Agile to Reach New Heights, Even Among Budget Constraints

Jackelynne Silva-Martinez, the webinar host, started by making announcements about the community's work on various resources like onboarding materials and Agile guidelines tailored to NASA's needs. She also highlighted resources available on the NASA Agile website, which include documents, publications, and conference papers detailing Agile practices within the Agency. Next, Jackelynne announced an upcoming face-to-face meeting for the Agile CoP leadership team in January with representatives from each Center. She then opened the floor for questions and comments regarding the announcements.

After introductions, Shenandoah Speers and Denise Amling took over to deliver the main presentation about the importance of adopting a lean-agile mindset for organizations.

Here are the key points:

- Traditional project management approaches like Waterfall are not effective for today's complex and ever-changing environments.
- Lean-agile combines Agile practices with Lean thinking to focus on continuous improvement, customer centricity, and delivering value in small increments.
- A key part of the lean-agile mindset is a growth mindset, which means believing that people can learn and improve over time.
- Agile is about iteratively delivering working pieces of a project and adapting to changes along the way.
- The Cynefin Framework helps decide when to use Agile vs Waterfall approaches. Agile is best for complex environments where there are unknowns.
- Business Owners prioritize their objectives for the Agile teams to focus on.
- Agile teams define their capacity and pull the prioritized work within their capacity.

Link to webinar: <https://nescacademy.nasa.gov/video/d477bce570414dd28db68e3c9cc76d691d>



NASA AGILE COP WEBINAR SERIES

**Scaling Agile to Reach New Heights
(Even Among Budget Constraints)**

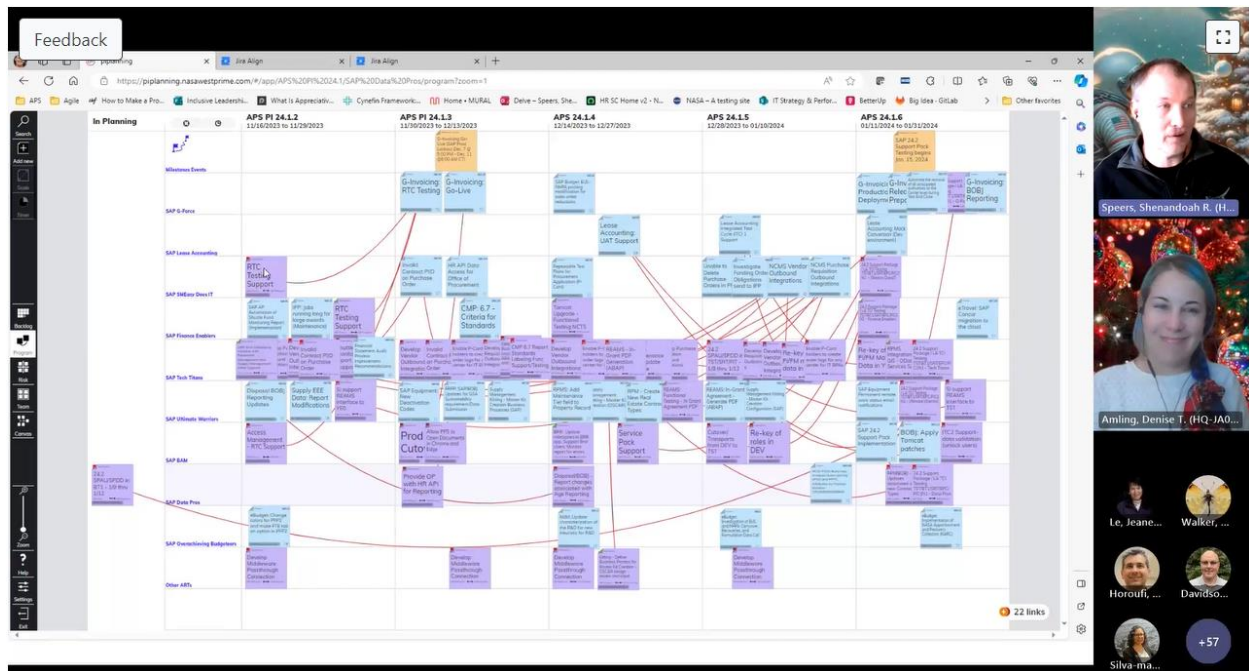
Shenandoah Speers
Director of Applications and Platform Services, NASA OCIO

Denise Amling
Agile Coach, NASA OCIO



Tune in to hear how the OCIO Application & Platform Services is on a journey to scale agile across the organization of about 700+ employees, changing culture and the ways of working to help deliver value faster, provide visibility into the workload, and understand the capacity to do the workload, while managing budget and resource constraints.

nen.nasa.gov/web/agile
Scaling Agile to Reach New Heights (Even Among Budget Constraints)



01/19/2024 - Seminar & Webinar: Value-Driven Product Delivery via Agile Mindset

The Value-Driven Product Delivery via Agile Mindset Webinar, presented by Chris Munk, Ramel Panaguiton, and Kasey Phillips, offered a comprehensive introduction to Agile at an agency-wide level, emphasizing the philosophy, values, and principles behind Agile implementation. The webinar highlighted the importance of incremental and iterative development, while enabling collaboration, adaptability, and responsiveness to evolving requirements. As the cultural and work landscape continues to evolve, so does NASA's changing role—primarily due to competitive technologies, the necessity for collaboration, and enhancing NASA's appeal to commercial industry partners to compete for scarce aerospace funding against a growing number of other organizations in government, academia, and commercial industries. As described in the webinar, depending on a task's characteristics, Agile Project Management may be applicable, and strongly considered as the most appropriate methodology to manage the level of uncertainty and complexity that a task may have. The webinar highlighted team empowerment to collaboratively perform, learn, and adjust their efforts based on customer and stakeholder feedback, promoting continuous improvement, and embracing flexibility—enabling “being Agile.” The presenters detailed Agile implementation applicability based on the needs of the project (and how others can assess the applicability to their work). Additional insights included defining “Value-Driven Product Delivery”, how to measure value, and how when value increases over time, typically risk to the project is reduced. Lastly, the Aerocapture Early Career Initiative Principal Investigator, Dr. Som Dutta provided a high-level overview of his project and the team structure within the Agile environment, and was highlighted as an Agile implementation success story at NASA Langley.

Link to webinar/seminar:

<https://nescacademy.nasa.gov/video/b79bc9ebbb314e7cb1ee674a79eeb8021d>

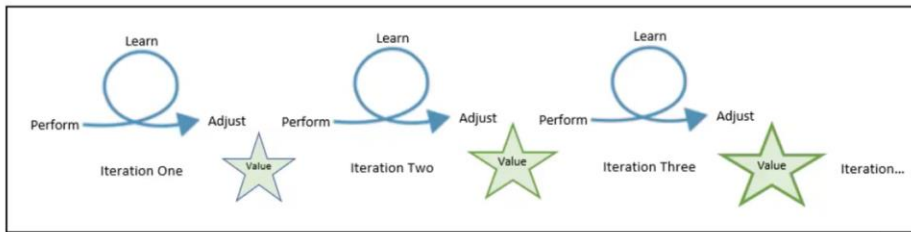
Value Increases as the Team: Performs, Learns, and Adjusts



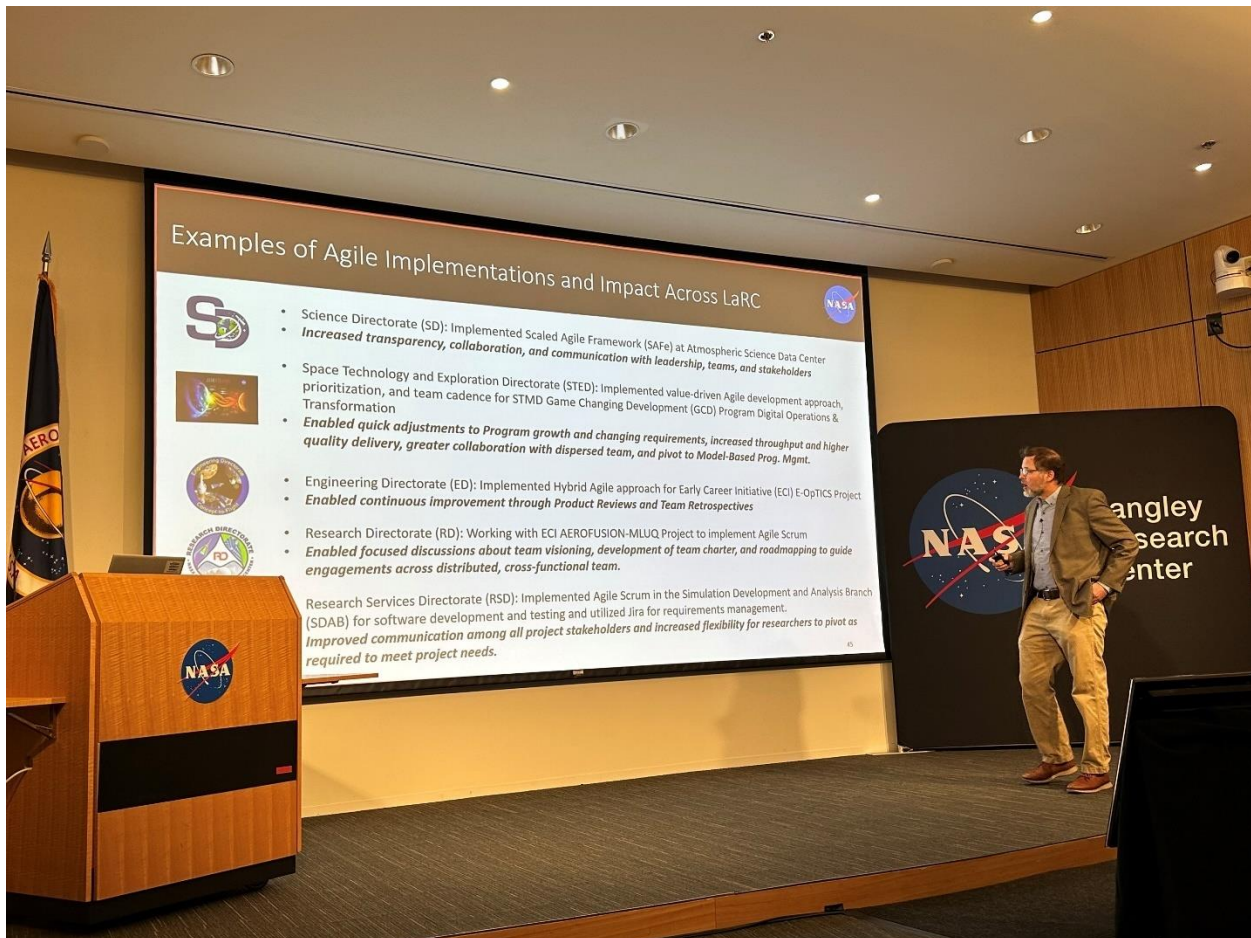
In Scrum, value is delivered incrementally allowing a frequent feedback loop with customers and stakeholders

- Helps ensure mission and business needs are being met
- Identify and reduce risks
- Visualize pivotal opportunities.

Once the team receives feedback, the team can adapt their efforts to ensure continuous product improvement on short timescales throughout the duration of the project's timeline



0:35:58 Inspired by: Agile Manufacturing Guide 0:50:12



02/16/2024 - Agile Flight Software Development in NASA's Waterfall World

The webinar presentation focused on the efforts of David Swartwout and his team at JSC engineering to incorporate the benefits of Agile development within the structured environment governed by NASA Procedural Requirements (NPRs).

Traditional Waterfall vs Agile: A Tale of Two Methodologies

The traditional waterfall life cycle, codified by NASA procedural requirements, follows a rigid, sequential approach. Requirements are meticulously defined at the outset, followed by distinct phases for design, development, testing, and deployment. This linear progression, while ensuring thoroughness, can struggle with the inherent uncertainties of complex projects.

Agile methodologies, on the other hand, embrace an iterative and collaborative approach. Working in short sprints (time-boxed cycles), teams develop, test, and refine features in a continuous loop. This fosters quicker feedback, allowing for course corrections and adaptation to evolving requirements.

The Waterfall Woes for Flight Software

The waterfall approach presents particular challenges for flight software engineering. Defining all requirements perfectly at the beginning can be near impossible, considering the intricate nature of these systems. Making changes later in the process becomes cumbersome and expensive. Additionally, the waterfall model suffers from a delayed feedback loop, potentially leading to the discovery of critical issues far into the development cycle.

Agile's Allure for Flight Software Development

Agile methodologies offer a compelling alternative for flight software development. By working in smaller, iterative cycles, teams can identify and address problems much sooner. Early and continuous feedback on requirements allows for adjustments as needed. Furthermore, Agile fosters a collaborative environment where engineers, testers, and other stakeholders work together seamlessly, potentially leading to improved software quality.

Bridging the Gap: Agile Within NPR Constraints

The key to successfully implementing Agile within NASA's procedural framework lies in focusing on the intent of the NPRs rather than getting bogged down in the specifics of documentation requirements. JSC engineering is exploring ways to integrate documentation creation into the development process itself, ensuring all necessary information is captured without sacrificing the iterative nature of Agile.

Overall, this presentation highlights the ongoing effort to reconcile the agility of modern development practices with the rigorous safety and documentation demands of critical space systems. By finding this middle ground, NASA can potentially reap the benefits of faster development cycles, improved software quality, and a more collaborative engineering environment.

Link to webinar: [Agile Flight SW Development in NASA's Waterfall World - 20240216](#)

Agile Software Engineering in NASA's Waterfall World

David Swartwout
GW Production Software Lead
16 February 2024

Not reviewed for export control – DO NOT DISTRIBUTE

Use Case Based Advancement of System Capability

- Working with product owners and relevant stakeholders
 - Determine list of operational use cases that can be reasonably developed and demonstrated at this phase of the lifecycle
 - Use cases are peer reviewed
 - Used for training and familiarization
 - Helps to flush out requirements
 - Helps to define interfaces
- Advance hardware in the loop capabilities
 - Understand simulation and emulation requirements
 - Understand fidelity of hardware environment
- Integrated demonstration of capabilities and regular cadence throughout the phase
 - We choose a three month integration cycle
 - Based on a two week team sprint cycle
- Continuous Improvement of Tools and Processes
 - Enhancing CI pipeline
 - Development of emulators and simulators
 - Lessons learned from prior phases
 - Documenting process enhancements
 - Updating templates

ID	Description	Dependencies	API	Implementation Status	Test Status
CSIC-15-001	The team is working on the integration of the hardware and software components for the mission.	CSIC-15-002, CSIC-15-003	API-001	In Progress	Not Started
CSIC-15-002	The team is working on the integration of the hardware and software components for the mission.	CSIC-15-001, CSIC-15-003	API-002	In Progress	Not Started
CSIC-15-003	The team is working on the integration of the hardware and software components for the mission.	CSIC-15-001, CSIC-15-002	API-003	In Progress	Not Started

03/15/2024 - Implementing Scaled Agile Framework (SAFe) at DoD Lessons Learned

In this presentation, Lymari Castro described a case study where her organization traditionally reliant on external vendors for high-performance computing solutions, underwent a significant transformation. They decided to focus on in-house capabilities and become the final integrator themselves. This required a major cultural shift and the development of new skills within the workforce.

To manage this transformation, the organization implemented the Scaled Agile Framework (SAFe) for the first time. Castro discussed the challenges they faced, which included integrating SAFe with their existing waterfall life cycle and the inherent difficulty of changing a well-established organizational culture.

One key point Castro highlighted was that the biggest challenge was not technical. While they needed to grow their software development expertise, the core hurdle was the cultural shift. For over two decades, the organization had functioned in a specific way. Implementing SAFe meant changing those ingrained patterns and behaviors.

Another interesting aspect Castro touched on is the hybrid approach that emerged during the implementation. Program management, for example, had to bridge the gap between the traditional waterfall lifecycle and the new SAFe cadence. They balanced the established program increment planning with the risk identification processes required by SAFe.

Overall, this case study offered valuable insights into the challenges and considerations involved in adopting SAFe particularly within a large organization undergoing cultural change. It highlighted the importance of not only understanding the technical aspects of the framework but also addressing the cultural shift that often goes hand-in-hand with such implementations.

Link to webinar: <https://nescacademy.nasa.gov/video/80bf682c870a4b96a278b18d0c533e681d>

Implementing Scaled Agile Framework (SAFe): Lessons Learned

by Lymari Castro-Diaz
Technical Director, Cross Access Foundation Division
DoD, Ft. Meade, MD

Making Incremental Improvements

- Organized around value (completed)
- Created implementation plan (completed)
- Program Increment 0 (completed)
- Program Increment 1 (completed)
- Program Increment 2 (completed)
 - Trained additional internal SPCs
- Program Increment 3 (in progress)
 - Better stories, features, and capabilities
 - Improvements in using the agile approach
 - Offer intermediate level SAFe training
- Program Increment 4 (upcoming)
 - Assigning business value
 - Collect metrics for improvement
 - Explore how to scale to the PMO (agile program management, agile contracting)

04/12/2024 - Agile implementation in the development of the Aeronautics Research Mission (ARM) Directorate Test Data Portal

In this webinar, Daniel Jones, Aerospace Engineer at NASA Armstrong Flight Research Center, provided a summary of ARMD Test Data Portal (TDP). ATDP provides a system that allows NASA personnel to remotely upload, register, search, access, and download test data. The differences from FDAS include: web-based solution allowing remote access, enhanced security measures including multi-factor authentication, and ability to store and access metadata for better data management.

1. Rationale for using Agile:
 - Initially planned to use the classical SE process.
 - Identified risks related to user acceptance and the need for greater stakeholder engagement.
 - Outreach efforts were conducted to gather feedback from stakeholders.
 - Decided to adopt a hybrid approach combining classical SE and Agile methodologies.
2. Implementation of Agile in TDP:
 - Adopted a hybrid process with classical SE milestones and Agile development cycles.
 - Agile methodologies helped maintain high levels of customer satisfaction and continuous feedback.
 - Emphasis on the unique requirements of software development projects compared to hardware projects at NASA Armstrong.
3. Challenges and learnings:
 - The leadership team realized the need for more knowledge and expertise in Agile methodologies post-PDR.
 - Continuous learning and adaptation were necessary to effectively implement Agile practices.

The meeting highlighted the ongoing efforts to integrate Agile methodologies within NASA's project management framework, particularly in software development projects. The introduction of new guidelines and resources aims to support teams in adopting Agile practices effectively. The detailed presentation by Daniel Jones provided valuable insights into the practical application of Agile in the development of the ARMD Test Data Portal, showcasing the benefits and challenges of this approach. The upcoming Agile Technical Interchange Meeting will further facilitate knowledge sharing and collaboration among Agile practitioners across NASA.

Link to webinar: [8. Intro of Agile SE Process at NASA AFRC - 20240412.mp4.url](https://www.nasa.gov/afrc/20240412.mp4)

**Introduction of an
Agile Systems Engineering Process to the
NASA Armstrong Flight Research Center**

Daniel S. Jones and David Tow
NASA Armstrong Flight Research Center
Jason L. Holland
ASRC Federal System Solutions, LLC (AFSS)

2024 AIAA SciTech Forum, January 8th – 12th, 2024

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after, I'd be happy to to take
any questions there.

Agile SE Implementation for ATDP

The ATDP TRR Mindset

The team realized that the effort required to fully implement a hybrid SE process was underestimated

- There was a redundancy of documentation and milestone reviews to fully adhere to two SE processes
 - Maintaining full adherence to the classical SE process and the agile SE process was not efficient
- Continued full adherence to the agile SE process was required for the future of the project due to the same two reasons that initially prompted the ATDP project to utilize this SE process
 - The project requires a high level of customer satisfaction from numerous stakeholder organizations
 - Many software development projects succeed while utilizing an agile SE process
- ATDP project realizations:
 - Some projects are more productive while implementing the classical SE process
 - Some projects are more productive while implementing the agile SE process
 - In unique cases, some projects can implement some aspects of both SE processes
 - **No project (at NASA AFRC) should ever fully adhere to the classical SE process and fully adhere to the agile SE process**

14
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06/7/2024 - Systems Engineering Agility - 8 Strategic Aspects

This presentation was provided by Rick Dove, an independent researcher and systems engineer with a focus on system security and agility, who is currently the chair for the INCOSE Agile Systems Engineering Working Group. Key points from the presentation are summarized as follows:

1. Lifecycle Spectrum:
 - a. Traditional sequential process (often misrepresented as the waterfall model) versus concurrent, asynchronous processes.
 - b. Importance of being able to iterate and adapt at any stage of the lifecycle.
2. Aspects of Agility:
 - a. Focus on eight strategic aspects necessary for achieving agility in systems engineering.
 - b. These aspects encompass agile operations, systems engineering processes, products, and workforce adaptability.
3. Strategic Roadmap:

- a. A roadmap for evolving and maturing application concepts over the long term.
 - b. Published guidelines emphasize moving beyond basic agile practices to more advanced implementations in large organizations.
4. ISO Standards and Publications:
- a. The presenter's work on agility is being incorporated into ISO/IEC standards, specifically ISO 24748.
 - b. A primer and a more detailed guide are in development to provide comprehensive coverage of the eight strategic aspects.
5. Case Stories:
- a. Examples from various industries (e.g., Navy, Rockwell Collins, Tesla) illustrating the application of the eight aspects.
 - b. Future case stories will include space systems and lottery systems to further exemplify practical implementations.
6. Operational Response and Mechanisms:
- a. Emphasis on the need for mechanisms that enable continuous sensing, responding, and evolving.
 - b. Importance of agile, modular architecture to facilitate easier adaptation and evolution of systems.

Rick Dove and the hosts encouraged attendees to continue the conversation offline and reach out for further discussions. The meeting concluded with gratitude towards the presenter and attendees, with a reminder to access the slides and other materials shared during the webinar.

Link to webinar: [9. Systems Engineering Agility 8 Strategic Aspects - 20240607.mp4](#)

Lifecycle Spectrum

The diagram shows a spectrum from left to right. On the left is a vertical stack of stages: Concept, Development, Production, Utilization, Support, and Retirement, labeled 'Extremely Sequential'. On the right is a circular diagram with the same stages around its perimeter, labeled 'Extremely Agile'. A central horizontal bar connects the two, with 'certain knowledge environment' on the left and 'uncertain knowledge environment' on the right. A yellow circle in the center of the circular diagram is labeled 'Situational Awareness'.

Agile systems engineering is first and foremost systems engineering as it is known through its ISO/IEC/IEEE standards, the Vee model, the INCOSE Systems Engineering Handbook, and however it is practiced by organizations that design, build, and sustain systems.

What distinguishes it as "agile" systems engineering is its leverage of situational awareness, its enablement of continual system evolution, and its intent to satisfy mission rather than plan.

Being Agile: Operations Concept

Needs: Attentive operational response to evolving knowledge and dynamic environments.

Behaviors: Sensing, responding, evolving.

Discussion: Agile systems engineering is not about doing Agile, it is about being agile. Being agile is a behavior, not a procedure – a behavior sensitive to threats and opportunities in the operational environment, decisive when faced with threat or opportunity, and driven to improve these capabilities. Deciding how to implement any of the core aspects, even this one, should be done with sense-respond-evolve principles in mind as aspect objectives.

Three principles that operationalize agility

13

07/19/2024 - Agile Tools and Techniques

Agile CoP Deputy Alex Desharnais facilitated a workshop on agile tools and techniques used across the agency. This allowed the CoP to exchange information on pros and cons from tooling used to facilitate progress tracking, requirements management, task planning, and for Agile ceremonies in general. The Agile tools poll results are available in the metrics section.

Link to discussion: [10. Agile Tools and Techniques - 20240719.mp4.url](https://www.youtube.com/watch?v=10.AgileToolsandTechniques-20240719.mp4)

Mentimeter

Tool Selection Criteria Considerations

- Support iterative, incremental development
- Support cross-functional workflows
- Integration with other tooling
- User Experience (easy-to-use)
- Offer reporting and analytics
- Enterprise support
- Security (FedRAMP, SSO)

Desharnais, Alex (US 3198)

VACCARI... Mingo, ...

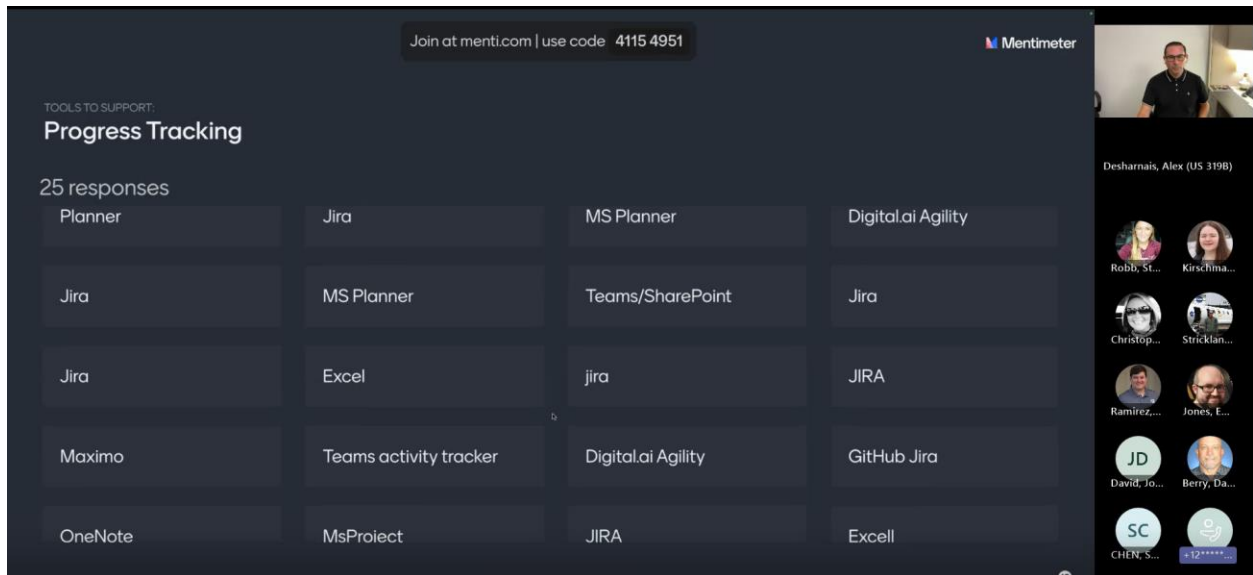
Christop... Stricklan...

Hongam... Jones, E...

JD David, Jo... Berry, Da...

SC CHEN, S... KM Mitchell,...

+44



Agile Technical Interchange Meeting

Overview

The NASA Agile Community of Practice hosted its first Technical Interchange Meeting (Agile TIM) to provide an opportunity for Agile practitioners to share their Agile projects, successes, challenges, recommendations from Agile transformations, etc. The sessions were recorded and made available through the NASA Agile CoP website and teams channel.

General Themes:

- Stories from NASA projects using Agile principles, tools, methodologies
- Successes, challenges, recommendations from Agile transformations
- Demos that complement the presentation were encouraged

Duration of each topic:

- Total time: 30minutes
- Presentation/Demo: 20 minutes
- Q&A: 10 minutes

Logistics

Title: NASA Agile TIM

Date: Monday, May 6, 2024

Modality: Hybrid

- In-person option at GRC (GRC's Guerin Management Center, Building 304), a day before NASA Systems Engineering Workshop (May 7-9)
- Virtual option via Microsoft Teams

Important Dates

Call for Agile presentations	February 8
Registration opens (no cost)	February 8

Abstract submission deadline	March 22
Abstract acceptance notification	March 29
In-person registration deadline	April 23
Presentation submission deadline	April 26
NASA Agile TIM	May 6

Abstract Submissions

- Abstracts were no longer than 400 words.
- Abstracts were submitted to Agile TIM website.

Registration

- Registration happened via Agile TIM website.

Presentation Submissions

- Template for presentations was available in Agile TIM website.
- Presentations were submitted via OneDrive folder sent to presenters. Reminders were sent to presenters.
- Presenters were responsible for any approvals needed to share their content.

Organizing Committee

- Technical Chair: Jackelyne Silva-Martinez
- Communications Chair: Daniel Hoffpauir
- Logistics GRC Team: Curtis Flack, Eric Hendricks, Carolyn Storer
- Agile CoP Leadership Team, Prentis Aguilar

Agile TIM Agenda

The TIM agenda, as executed was as follows:

Time	Topic	Presenter	Format
8:30	Introductions and Welcome	Dr. Jackelyne Silva-Martinez	In person
9:00	Keynote: The Criticality of MBSE to Deploying Agile Systems Engineering	Dr. Bruce Douglas	In person
10:10	Group Photo & Break		
10:30	Creating a Culture of Agility	HQ/Denise Amling	Remote
11:00	Scaled Agile Framework and the effects on the Application Platform Services Cyber Team	MSFC/Kyle Driver	In person

11:30	Stennis Space Center's Agile Journey	SSC/Alex Elliot	Remote
12:00	Experience with a Hybrid Traditional/Agile Approach on Hardware-Centric Project	AFRC/Jeanette Le	In person
12:30	Lunch		
1:30	Keynote: Agile in NASA 2040	Carla Procaccino	In person
2:00	Tailoring Agile Approaches to Drive Earth Science Research and Development Projects	GSFC/Tammy Ashraf	Remote
2:30	Effect of Software Architecture on Team Agility: An Informal Case Study	ARC/Dr. Joseph Rios	Remote
3:00	Break		
3:15	NASA Launch Services Program (LSP) Systems Engineering Collaboration with SpaceX	KSC/Kelley Jones-McDowall	In person
3:45	Agile Principles from the ISS CMC Buy and Fly Hardware Certification Process	JSC/Amit Patel	Remote
4:15	How OpenMDAO Maximizes our Impact with Agile Practices	GRC/Robert Falck	In person
4:45	Wrap-up & Retrospective	JPL/Alex Desharnais	In person
5:00	End of Agile TIM		

TIM Summary

As a high level summary, the Agile TIM offered:

- Opening Remarks: The meeting began with a welcome by Jackelyne Silva-Martinez, who highlighted the purpose of the meeting: to share knowledge and experiences across different centers using Agile principles. The launch of two products was announced:
 - The Agile Community Practice Playbook: A comprehensive guide outlining the strategic plans for integrating Agile practices within the agency, including short-term and long-term goals to support teams across the Agency in their Agile transformations.
 - Agile Executive Summary: A summary presentation to be used by CoP members in support of their discussions with their teams, management, etc.
- Presentations:

- Multiple presentations were scheduled to share insights and experiences from different teams and projects.
- Discussions on user stories, use cases, and the distinction between technical and business epics.
- The importance of continuous delivery, quality improvement, and stakeholder involvement was stressed.
- Agile Methodologies and Practices:
 - Explanation of various Agile concepts, including epics, user stories, use cases, and scenarios.
 - Discussion on the importance of maintaining quality through continuous integration and delivery, and the role of stakeholder feedback in Agile processes.
- Model-Based Engineering:
 - Insights from an expert with extensive experience in real-time embedded systems and model-based engineering.
 - Emphasis on incremental development and hypothesis-driven development to avoid defects and ensure system correctness.
- Challenges and Solutions:
 - Addressing challenges in Agile implementation, such as managing technical debt and ensuring stakeholder engagement.
 - Use of formal methods in specific scenarios to enhance system reliability and performance.
- Closing Remarks:
 - The meeting concluded with a roadmap for future activities and a call for ongoing collaboration and knowledge sharing.
 - Encouragement to use the available resources, tools, and community support to enhance Agile practices within NASA.

The summary of each of the topics will be presented as a technical paper at the International Astronautical Congress. This report contains a summary of the two TIM keynote speakers.

Agile in NASA 2040

- Carla Procaccino started with an introduction and a brief overview of the NASA 2040 initiative, which aims to maintain NASA's leadership in research, technology, engineering, and space exploration by adopting agile methodologies.
- **Leadership and engagement:** Carla mentioned that there was an emphasis on the importance of leadership engagement in driving Agile initiatives. Leaders and sponsors are actively involved in supporting and promoting these initiatives across the Agency.
- **Agile mindset and sustainability:** Discussion on adopting an Agile mindset within the NASA 2040 team to ensure long-term sustainability and continuous improvement. The team aims to use iterative cycles to adapt and learn from experiences.
- **Standards and process improvement:** Addressing the challenges and perceptions related to standards in Agile environments. Efforts are being made to create new standards and processes that support Agile practices and improve Agency operations.
- **Microservices and technical architecture:** Transition from monolithic applications to microservices architecture, enhancing extensibility, deployability, and agility. The use of technologies like DevOps, GitOps, and Kubernetes were highlighted.

- **Intergovernmental collaboration:** Example of collaboration with the FDA, showcasing how NASA's systems can be extended for use by external entities, demonstrating flexibility and responsiveness.
- **Agile practices and feedback:** The importance of using Scrum and other Agile practices to gather feedback from various stakeholders. Smaller group discussions and one-on-one engagements are recommended for detailed feedback.
- **Challenges with microservices:** Discussion on potential complexities in managing microservices, especially for real-time embedded systems. The suitability of microservices for different environments is being considered.
- Participants asked questions about the practical aspects of Agile implementation within the NASA 2040 vision, the balance between innovation and commercial practices, and how to sustain these changes over the long term.
- Carla encouraged participants to use available resources such as the NASA 2040 SharePoint site and existing documentation and reiterated the importance of continuous engagement and feedback from the community.

The Criticality of MBSE to Deploying Agile Systems Engineering

- Bruce Douglas' keynote presentation delved into several critical aspects of developing high-reliability, safety-critical systems using Agile methodologies and Model-Based Engineering (MBE) and Model-Driven Development (MDD):
 - **Foundation of Quality and Reliability:** Douglas highlighted that MBE is crucial for improving the quality and reliability of systems. He emphasized the iterative and incremental nature of MDD as a powerful approach to building complex systems.
 - **Continuous Verification:** The process involves continuous correctness verification to ensure that the models accurately represent the system's behavior and requirements. This continuous verification is essential for maintaining high quality throughout the development lifecycle.
 - **Importance of Verifiable Models:** He stressed that models should be verifiable and falsifiable to ensure they meet the desired specifications. Models must be tested regularly to confirm that they can fulfill their intended functions.
- **Agile methodology in high-reliability systems:**
 - **Agile as an improvement over traditional methods:** The speaker advocated for Agile as a response to traditional, rigid development processes. He argued that Agile focuses on better processes rather than more processes, which is critical in managing the complexity of high-reliability systems.
 - **Frequent delivery and feedback:** Agile's emphasis on frequent delivery, stakeholder involvement, and continuous feedback loops is particularly beneficial for preventing defects early in the development process. This approach ensures that systems meet user needs and adapt to changes quickly.
 - **Tailoring Agile for specific needs:** He pointed out that Agile methodologies must be adapted to the unique requirements of high-reliability systems. Standard Agile practices might not cover all the needs of such systems, necessitating specialized practices.
- **Verification and validation across the lifecycle:**
 - **Continuous process:** Bruce underscored the importance of continuous verification and validation (V&V) throughout the entire development process. He argued that waiting until the end of development to verify and validate the system can lead to significant issues and defects.

- **Ensuring system integrity:** V&V should be integrated into every phase of the development lifecycle to ensure the system's integrity and correctness. This continuous V&V approach helps in catching errors early, reducing the risk of failures in the final product.
- **Distinction between system engineering and software engineering:**
 - **System Engineering produces specifications:** He made a clear distinction between system engineering and software engineering. System engineering is primarily concerned with producing specifications that define what the system should do.
 - **Software Engineering produces computations:** In contrast, software engineering focuses on implementing these specifications through computational models and algorithms.
 - **Role of models and engineering data:** It was emphasized that models and engineering data are at the heart of system engineering. Diagrams, while useful, are not the end goal; the primary focus should be on the underlying engineering data that drives the system's design and functionality.
- **Integration of DevSecOps:**
 - **Combining development, security, and operations:** The speaker discussed the importance of integrating development, security, and operations (DevSecOps) for managing high-reliability systems. He pointed out that in industries like defense and aerospace, where security and reliability are paramount, DevSecOps is critical for ensuring that these systems are both secure and operationally effective.
 - **DevSecOps in high-reliability systems:** This integration helps in addressing the unique challenges of high-reliability systems, where security vulnerabilities can have catastrophic consequences.
- **Specialized Agile practices for high-reliability systems:**
 - **Beyond standard Agile:** Bruce highlighted that developing high-reliability systems often requires practices beyond those found in standard Agile literature. For example, specialized test coverage analysis, continuous integration (CI), and rigorous architecture design are necessary for these types of systems.
 - **Critical nature of test coverage:** Test coverage analysis, in particular, is crucial for ensuring that all parts of the system are tested thoroughly and that no critical components are overlooked.
 - **Architectural design in Agile:** He also emphasized the importance of architectural design in Agile for high-reliability systems, which ensures that the system's structure supports its required functions and performance.
- **Adaptation of Agile to Complex Systems:** Bruce concluded by reiterating the necessity of adapting Agile methodologies to suit the specific needs of high-reliability systems, particularly in complex engineering environments like aerospace and defense. He encouraged practitioners to focus on continuous improvement, verification, and the integration of security throughout the development process. The presentation provided a comprehensive overview of how Agile methodologies when combined with Model-Based Engineering and DevSecOps can be effectively applied to the development of high-reliability, safety-critical systems, ensuring that these systems meet stringent quality, security, and reliability standards.

Link to recorded videos: [Recordings](#)

Link to presentations: [Presentations](#)

Photos from Agile TIM





Metrics

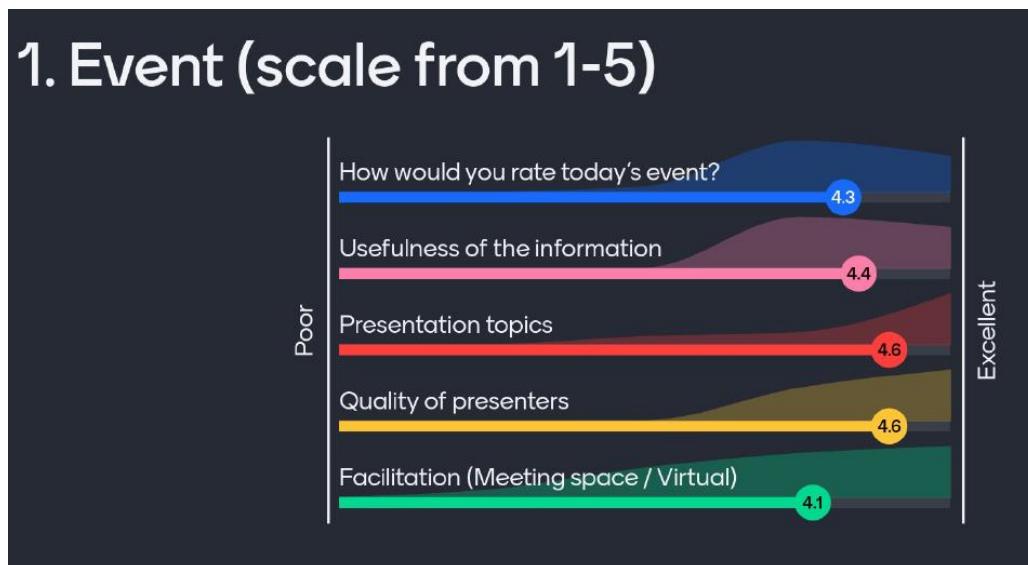
Events Attendance

Dates	Attendees	Type of Meeting
8/18/2023	98 online	Webinar
9/15/2023	36 online	Workshop
10/13/2023	64 online	Webinar
12/08/2023	81 online	Webinar
1/19/2024	209 online 30 in person	Webinar and Seminar
2/16/2024	199 online	Webinar
3/15/2024	114 online	Webinar
4/12/2024	122 online	Webinar
5/6/2024	38 in person 237 online	Technical Interchange Meeting Hybrid
6/7/2024	98 online	Webinar
7/19/2024	74 online	Workshop

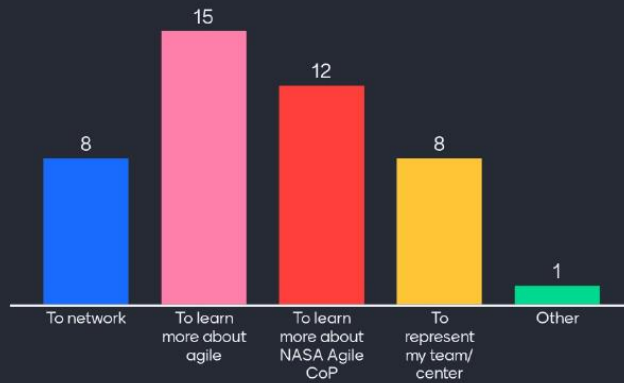
Agile CoP Members (as of August 5th, 2024)

NEN Site	205
Teams Channel	327
Active Teams Channel Users	260

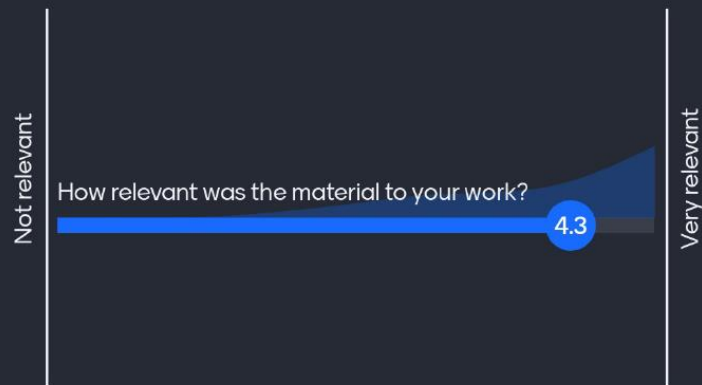
Survey from Technical Interchange Meeting



2. Why did you attend today's event?



3. Relevance (scale from 1-5)



4. What can we improve for next time?

Missing some presentation uploads.

Wait longer for people to ask questions and have more time for discussions. It felt a bit cut off.

I would love more dedicated time for networking.

Room for group discussion. More interactive

Provide presenter charts ahead of time so that we can navigate along asynchronously

Consider Some interactive workshop exercises

Would like more use cases, preferably with metrics. Kyle Driver pitch did a great job of this.

Better audio

IT Issues, more time	more time for lunch and networking breaks.	The schedule for lunch (delayed/shortened) cut short some networking opportunities. Suggest dedicated discussion times, maintaining lunch hour, or some other solution.	1) check audio before event begins2) offer an agile training event, perhaps a micro course part of a larger certification curriculum
I think I would like to be in the room next time the audio issues made it difficult to hear online. How tos on Hybrid and Agile for SE and PM not just development. break out rooms for scenarios chat			

5. What topics would like to see covered in future events?

Agile oversight of non agile rocket development projects.	Real life examples of scaling agile for larger teams.	I would love to see more software-specific topics!	How to engage with Line Management on Agile topics.
N/a	products showing patterns of how this can be adopted with 7120.5 and .8	More large scale agile efforts at NASA or other govt agencies.	Integration of Agile, MBSE, Digital Twin, and Test Automation

More detail on tools, costs, lessons learned. Some material was high level on Agile tooling but detailed on other domain topics.	industry standards for agile	Would love to see or do a workshop	Trade offs between alternate Agile processes and when they are recommended.
More interaction break out rooms to brain storm on examples of how to present agile information in our waterfall world. More information on managing schedule with hybrid and agile.			

Agile Roles and Areas of Expertise

34 members shared their areas of expertise. Out of those 34:

23 Members with Expertise in Agile Roles	18 Members with expertise in being Product Owner/Product Manager	15 Members with expertise in being a Scrum Master or team-level coach	7 Members with expertise in being an Agile Coach (enterprise, executive, or large-systems coaching)
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24 Members with expertise in at least one Framework	6 Members claimed expertise in Frameworks, in general	17 Members claimed expertise in Scrum	12 Members claimed expertise in Kanban	9 Members claimed expertise in SAFe or other scaling frameworks	7 Members claimed expertise in Lean
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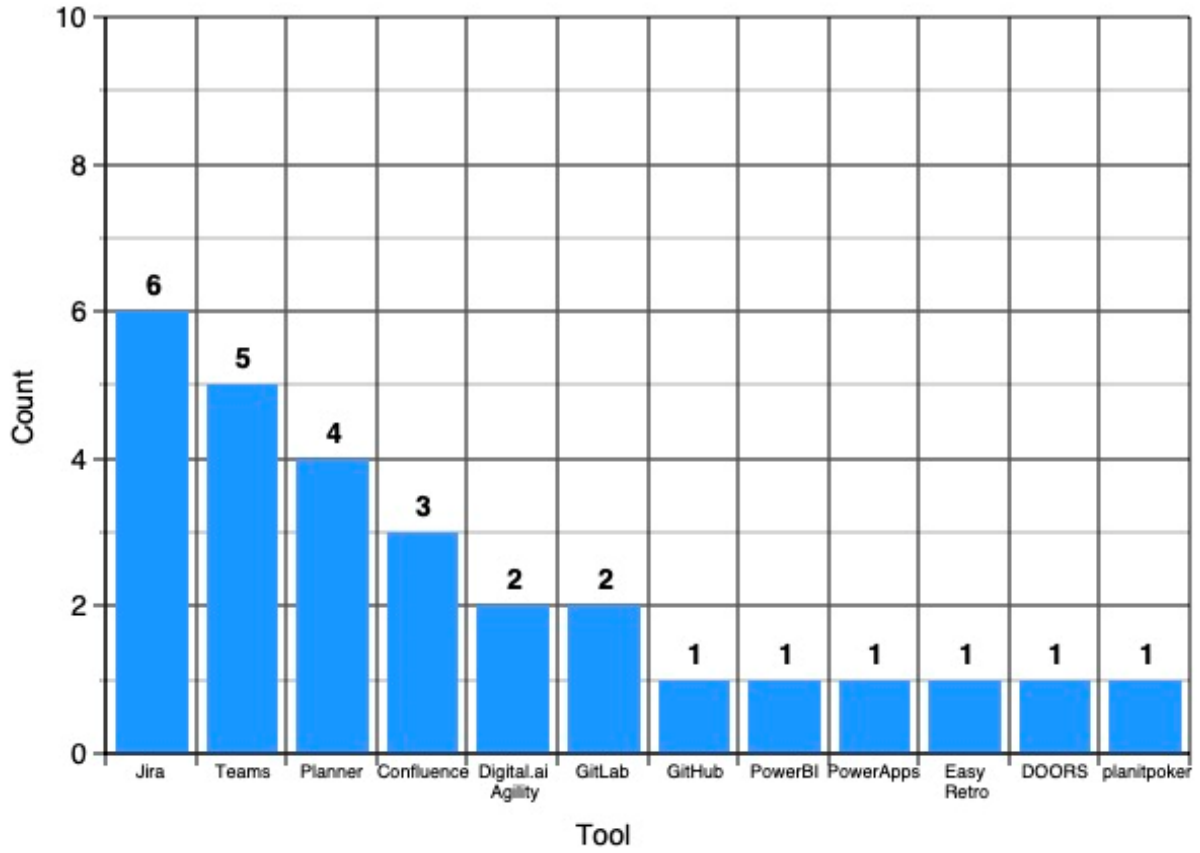
14 Tools for Agile Management	5 Tools for Automated Testing	8 Tools for Code Repositories	5 Tools for CI/CD
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Special Topics	2 Agile for Safety-Critical Systems	9 Agile Transformation
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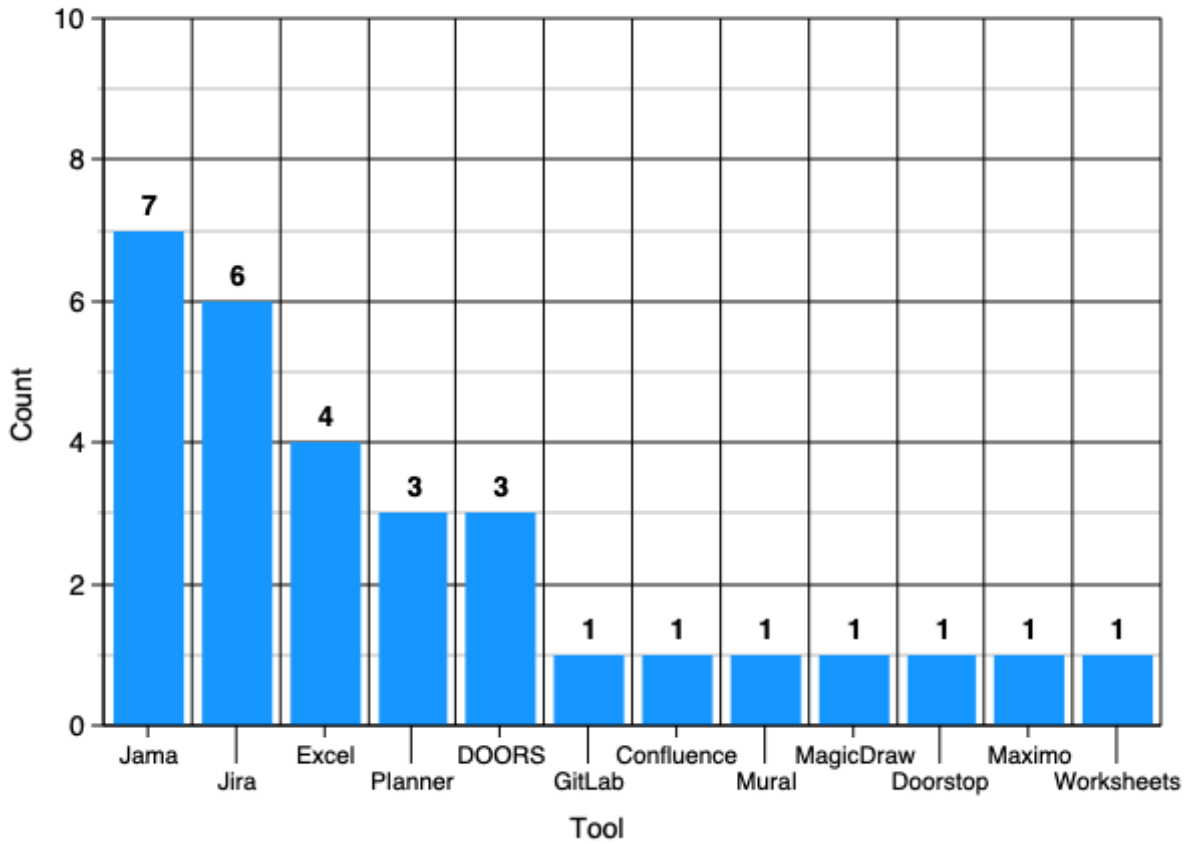
22 Agile PM	12 Agile SE	22 Agile Software Development	11 DevOps	3 Test-Driven Development	2 Agile Hardware Development	4 Agile Marketing, Writing, Content-Creation, or similar
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Agile Tools used across the Agency

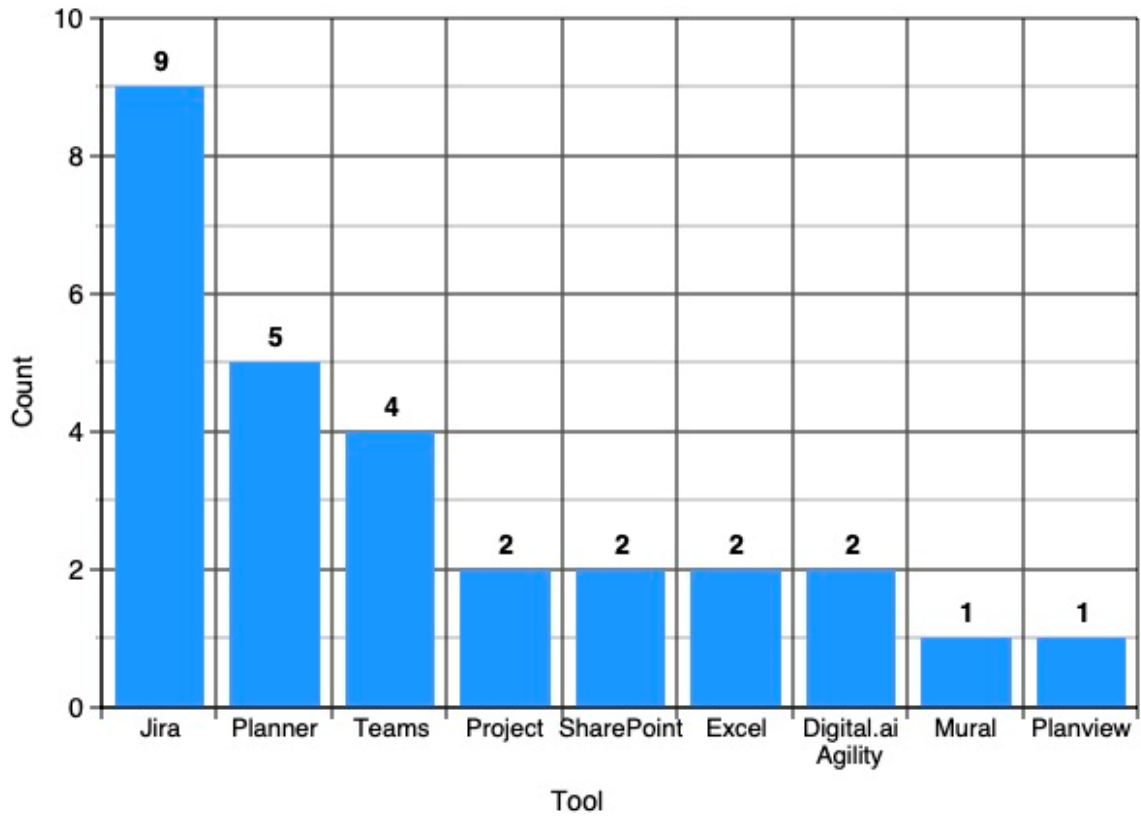
Agile Ceremonies



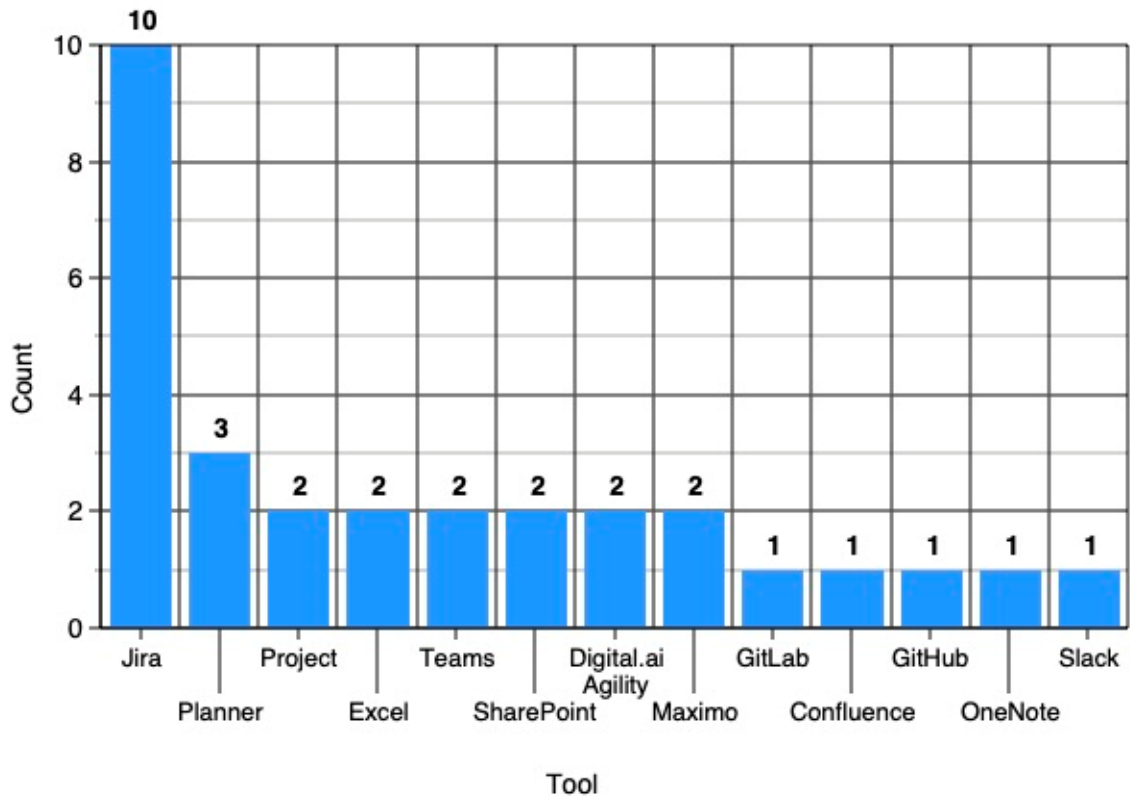
Requirements Management

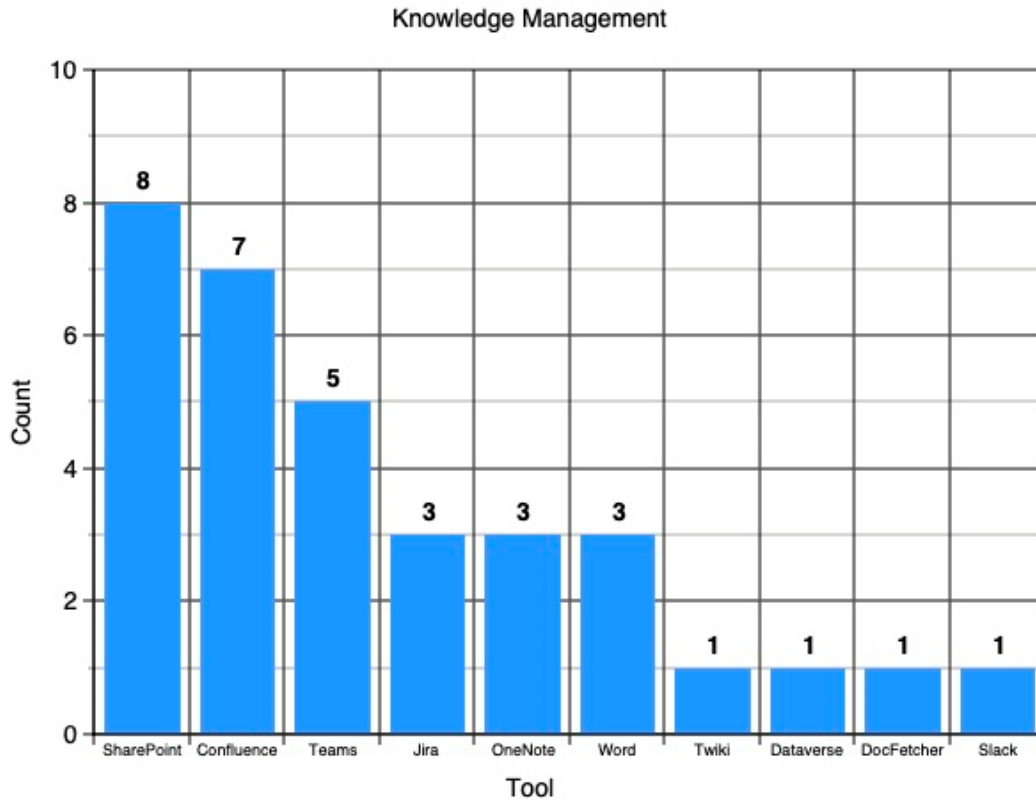


Task Planning



Progress Tracking





Website interaction metrics

NEN pageviews from 8/1/23 to 7/31/24

<input type="checkbox"/> agile	5,078
<input type="checkbox"/> /nasa-agile-tim-2024	1,083
<input type="checkbox"/> documents	834
<input type="checkbox"/> nasa-agile-tim-2024	499
<input type="checkbox"/> /registration	394
<input type="checkbox"/> /documents	290
<input type="checkbox"/> home	240
<input type="checkbox"/> /contacts	220
<input type="checkbox"/> /community-home	207
<input type="checkbox"/> /registration?p_p_id=com_life...	180
<input type="checkbox"/> events	175
<input type="checkbox"/> /abstract-submission	92

Presentations to Other Forums

- Systems Engineering Technical Discipline Team
 - Presented results from study of Agile teams at NASA, October 2023
 - Presented status of Agile CoP, roadmap, overview of Agile, NASA resources and references, February 2024
- Software Technical Discipline Team
 - Presented results from study of Agile teams at NASA, September 2023
- AIAA SciTech Forum
 - Presented results from study of Agile teams at NASA, January 2024
- INCOSE International Workshop
 - Presented a snapshot of Agile CoP efforts at NASA, January 2024
- NASA 2040 Processes Workstream
 - Collected inputs from the Agile CoP to support creation of problem statement based on Agile SWOT analysis, February 2024
- JPL Systems Engineering
 - Presented Agile overview and discussed some guidance on how to infuse it more widely across JPL, July 2024
- Interdisciplinary Digital Engineering Team
 - Presented Agile executive summary, August 2024

Acknowledgments

Members of the NASA Agile Community of Practice

Aaron Comis, GSFC

Alex Desharnais, JPL

Alex Elliot, SSC

Amit Patel, JSC

Bruce Douglas, MITRE Corporation

Caren Ensej, KSC

Carla Procaccino, HQ

Carolyn Storer, GRC

Charmine Baboolal, LaRC

Chris Edwards, LaRC

Chris Munk, LaRC

Courtney Hampton, LaRC

Curtis Flack, GRC

Cynthia Null, ARC

Daniel Hoffpauir, LaRC

Daniel Jones, AFRC

David Swartwout, JSC

Deb Goodenow, GRC

Denise Amling, HQ

Derrick Cheston, GRC

Eric Hendricks, GRC

Heather Livingston, GSFC

Iona Rus, GSFC

Jackelynne Silva-Martinez, JSC

Jeanette Le, AFRC

Joel Sills Jr., JSC

John Baca, AFRC

Jon Holladay, GSFC

Joseph Rios, ARC

Kasey Phillips, LaRC

Kelley Jones-McDowall, KSC

Kyle Driver, MSFC

Lorraine Prokop, JSC

Lymari Castro, DoD

Marian Cronin, GRC

Mary Beth Wusk, LaRC

Michael Arosz, DoD

Michael Gangl, JPL

Paul Liu, ARC

Prentiss Aguilar, LaRC

Ramel Panaguiton

Rick Dove, INCOSE

Robert Beil, KSC

Robert Falck, GRC

Ryan Carmichael, MSFC

Scott Tashakkor, MSFC

Shenandoah Speers, HQ

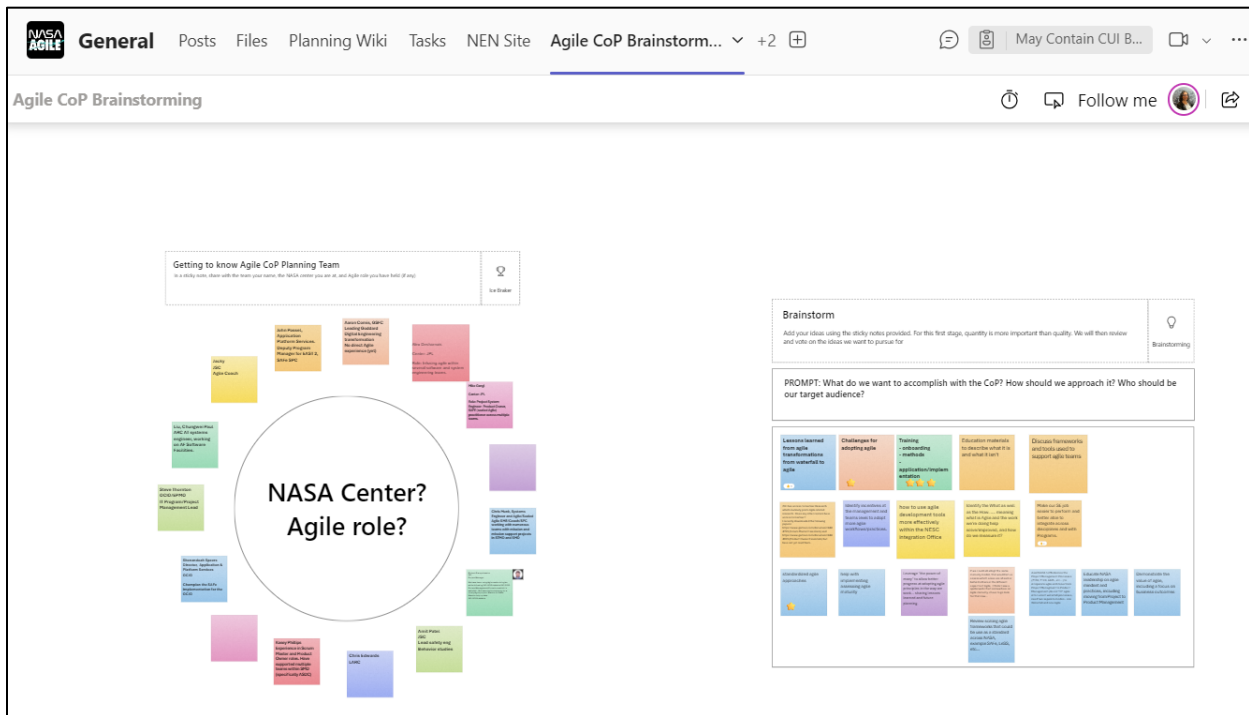
Tammy Ashraf, GSFC

Terry Hill, HQ

Timothy Barth, KSC

Appendix

Appendix A Brainstorming Sessions



Goals

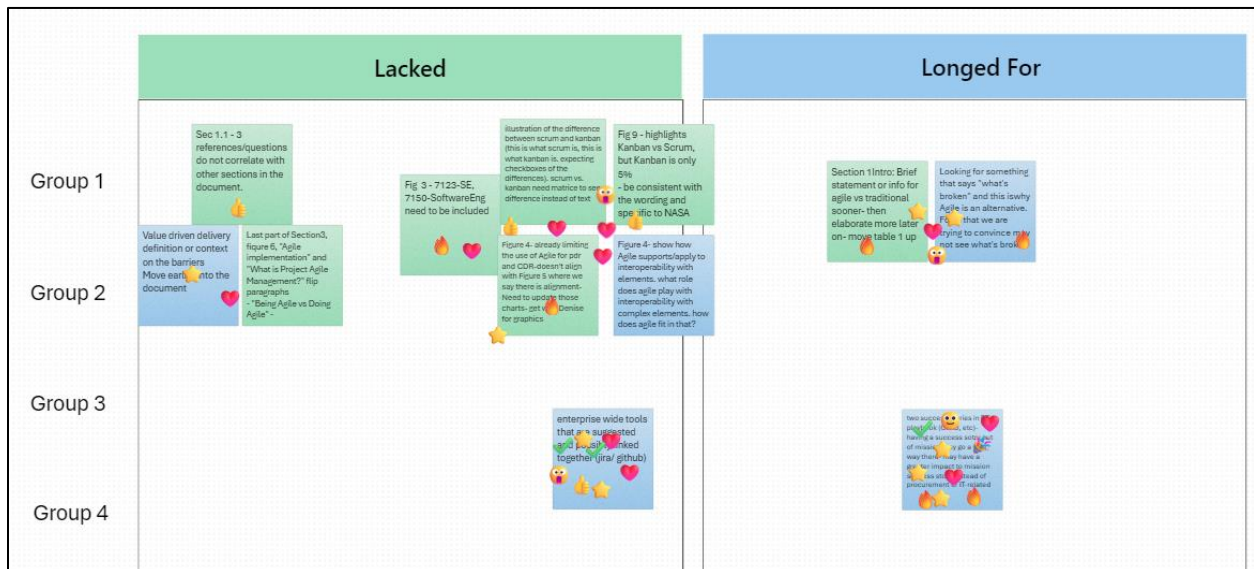
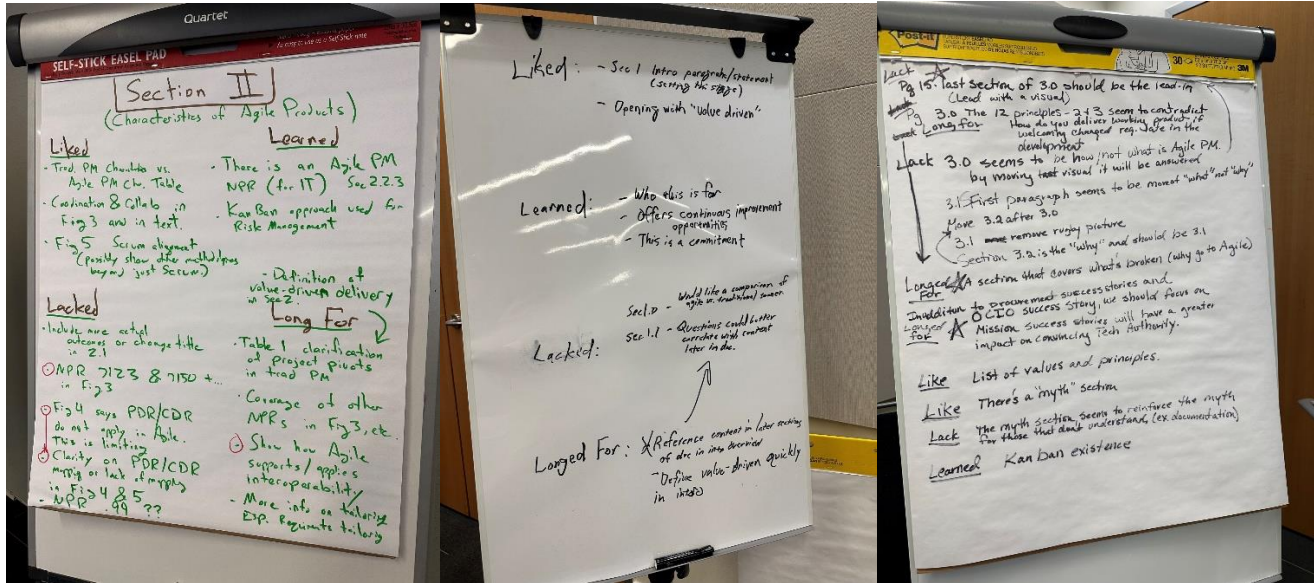
- Availability for experts, references, resources
- Advocates for agile tools
- Give visibility to existing tools, agile teams, etc.
- Communicate value of Agile to Centers, management/customers/employees
- Cultural change
- Paradigm shift
- Catalysts
- Multi-center collaboration, champions/sponsors at each center
- Increase workforce Agile capability across all Centers (certified POs, Scrum Masters, Agile Coaches)
- Educate project by project, mid-line leadership, and senior management
- Guidelines/training to SEs/PEs/PMs to incorporate Agile practices while working within the current/future NASA processes
- Provide additional guidance on future updates to NASA processes to incorporate Agile practices

Products

- Define the intent of Gate reviews to inform agile practices. What is the scope?
- With SAFe we observe the concept of Product Increments which are informed by gate reviews.
- Look and review gate reviews to see how we can do a better job of including and coexist with agile practices/development workflow.
- Need to address cultural change and the impacts. (People + Processes + Tools)
- Risks to hardware development has many more constraints compared to software.
- Agile and change in general is hard to socialize and gather buy-in. This is an opportunity and not a threat.

- Major interest in only meeting gate reviews / release deliverable cadence. Could be an opportunity to infuse the focus of value streams.
- Development of agile playbooks could be look into.
- SOP around agile practice / plan of operations. Built around SAFe.

Retrospectives



Appendix B CoP Planning Meetings

6/28/2023 Planning Meeting

- Getting to know each other
- Why are we here
- Brainstorming
 - Ideas captured in whiteboard: [Agile CoP Brainstorming](#)
 - Early categorization: Planning Wiki
- Actions:
 - Develop a draft charter, Jacky, by 7/12
 - Continue to add ideas to Planning Wiki, All, by 7/12

7/12/2023 Planning Meeting

- Kickoff meeting: 8/18
- Review of charter: agree on an initial version]
- Roles discussion: lead, deputy, and webmaster for CoP
- Planning Wiki inputs
- Actions:
 - Setup tool to use for backlog management, Alex, by 7/21
 - Review other CoP roles and Center reps slots in which you would like to support, All, by 7/21

7/21/2023 Planning Meeting

- Walkthrough of Jira Agile CoP project
- Discussion on monthly topics for CoP meetings/webinars.
 - Rough schedule will need to be confirmed with speakers/organizers
 - Webinars Chair (TBD) will work with NESC Academy (Dan) to help with advertisement, recording, and get webinar into NESC Academy
- Tasks for 8/18 kickoff meeting, actions to be tracked in Jira
- Actions:
 - Continue building backlog, Alex, by 8/4
 - Prep charts for kickoff meeting, Jacky, by 8/11
 - Create flyer (include website and Teams link), Dan, by 8/4
 - Add announcement in NEN site, Dan, by 8/4
 - Send save the date meeting notice, Jacky, by 7/21 (NESC Academy can use same Teams link for the recording)
 - Advertise to other TDTs, colleagues, groups, etc., All, by 8/11
 - Take notes during meeting, Alex, on 8/18
 - Record meeting, NESC Academy, on 8/18

8/4/2023 Planning Meeting

- Review actions from prior meeting
- Prep for 8/18 kickoff meeting

9/1/2023 Planning Meeting

- Introduction of new members of the CoP leadership team
- Thoughts on CoP kickoff
- Revisit leadership team positions
- Calendar of monthly events
 - NESC needed to cancel the face to face meeting in October, and can look to have one in early December
- Others
 - CoP Planning meetings time and frequency
 - leadership - strategic
 - body - tactical
 - Discussions
 - Concerned on how behind NASA is with Agile
 - need NASA examples

- show need of Agile outside of SW
- Saturn courses, OCIO training (also available to JPL) - info already in CoP resources
 - funding will go away at end of December
 - courses use SaFe as agile method, \$100 per person for license
 - would be hard to gain management support to pay for these as they don't understand Agile
 - can NESC sponsor some of those licenses
- playbook on how do I need to know Agile works
- terminology of risk, we don't want to reverse to 2 years ago
- ensure that difference is understood between methodology and mindset
- in guidelines, don't be prescriptive, interoperable methods
 - need engagement, communication, education, pilot projects, tailoring
- 7120 is being updated, 7123 would also need to be updated
 - should have a NPR POC for the CoP, added
 - POC for federal agencies adopting Agile, can also serve as presenters for the monthly meetings

9/28/2023 Planning Meeting

- Discuss upcoming speaker/presentation for next 10/13 CoP meeting and new date for Nov CoP meeting
 - 10/13 DoD acquisition topic, NESC Academy to support with meeting recording
 - If there is a shutdown and still not back by then, Alex will communicate to the CoP members that the meeting will need to be postponed
 - No Nov meeting in lieu of working on CoP products
- Discuss plans for products development (Product Leads)
 - Updates made in 'Products' section

10/27/2023 Planning Meeting

- Teams announced that Wiki tabs will be going away in November, will need to export content to Notes tab or somewhere else.
 - Jacky and Daniel completed it on 11/7
- Feedback from 10/13 meeting
- Planning for upcoming events
 - Nov: no general meeting, will be working on products
 - Dec: need final title and bios from Doah and Dennise, send to Daniel for advertisement
 - Jan: FTF at LARC, details in specific tab, Chris Edwards will be leading
- Products Status
 - Agile paper for SciTech: Jacky showed paper and reported it's under STRIVES tech review, Tim incorporating comments
 - Guidelines: Alex prepared an outline, see Tab for that specific product, will be reaching out to CoP for contributions
 - Onboarding: Chris and Kasey have a draft, working on sprints, chartering agile team in playbook, and facilitation guides, will be sending out to CoP for peer review
- Development of Strategic Plan
 - Started SWOT analysis with attendees, Jacky will be editing and sending for CoP to provide more inputs

11/29/2023 Planning Meeting

- Finalize prep for December webinar
 - Charts – Doah will send to Daniel
 - Advertisement – Daniel, by 11/30
- Status of products
 - Agile Teams Study Results (Jacky)
 - Paper and presentation for SciTech has gone through review and accepted for publication, it is now available in CoP products folder.
 - Strategic Planning (Jacky)
 - Received comments from CoP to SWOT analysis and incorporated it to the next sections for leadership capacity, plan to start drafting a first cut of the roadmap that we will be working at the FTF, as well as developing a growth strategy

- Guidelines (Alex)
 - See page for outline and planned content
- Onboarding (Chris and Kasey)
 - Roles and responsibilities to transition to agile, describes process, define agile jargon/terminology and addressing NASA projects, divergent thinking, team charter, user stories, does Agile apply to me and my project?,
 - Ready to share with CoP to request inputs, Kasey will add request to Teams Channel
- Status of FTF

1/5/2024 Planning Meeting

- Reviewed agenda and logistics for Agile CoP Leadership Face-to-Face Meeting [Agile CoP Face to Face](#)

2/2/2024 Planning Meeting

- Prep for February Webinar: [CoP Meeting Topics \(Web view\)](#) 10'
- Overview of Agile CoP TIM: [Agile CoP TIM \(Web view\)](#) 10'
- Review of Agile FTF actions: [Agile CoP Face to Face \(Web view\)](#) 20'
- Retro of Agile FTF: 20'

3/1/2024 Planning Meeting (via email)

- Please provide status on the actions [Planning Wiki](#)
 - anybody stuck?
- [Strategic Plan](#)
 - Alex, Jon, and Jacky met with Joe Pellicciotti to discuss the strategic plan, and based on his feedback:
 - Proposed a title change (there were other suggestions as well which are in the document itself)
 - TBD was added for the Agile management team
 - Product can be published/released as a recommendation of the CoP to the Agency
 - Jon will provide guidance on the format in which we will publish/release our strategic plan
- Agile TIM: <https://nen.nasa.gov/web/agile/nasa-agile-tim-2024>
 - Abstract submissions deadline was extended to March 22 - Daniel has updated the dates in the NEN site, please extend the invitation/update to other CoPs and TDTs as well
 - Center Reps, please advertise the TIM (and date update) within your Centers

3/29/2024 Planning Meeting

- April 12 CoP Meeting: Introduction of an Agile Systems Engineering Process to the NASA Armstrong Flight Research Center
 - One of the TIM's abstracts submitted moved to webinar, Jeanette coordinating, Daniel advertising
- Agile TIM: reviewed abstract submissions. Daniel will send out email to accepted abstracts for TIM. All other submissions will be invited for webinar opportunities. Doah is coordinating the afternoon talk with NASA 2040.
- Actions: Reviewed team's actions and updated status on Planner.

4/26/2024 Planning Meeting

- Reviewed progress and prep for [Agile CoP TIM](#)
- Report of progress and impediments on actions reflected in Teams Channel Planner

April-May Road to Agile TIM Weekly

- Tag-ups with organizing committee in preparation of the TIM

5/2/2024 Pre-Agile TIM Tag-up

- Met with presenters and organizing committee to go over agenda, questions, logistics, etc.

5/24/2024 Planning Meeting

- Review of Agile TIM
 - post-TIM actions in Planner
 - Reviewed feedback collected via Menti
 - Variety of Agile topics were great, served as teasers
 - People were craving to know more about Agile

- Some members from the SaFe community are too heads-down on their trains that didn't even know about the event, opportunity for outreach
 - Goddard may need more reminders or awareness if haven't reached the agile groups there
 - Denise has some contacts and has reached out
 - Heather, GSFC POC, received great feedback from her center attendees to the TIM; they are working on coming up with an agile working group in their center to facilitate comm
- Should have a networking part in the program for virtual attendees to get to know each other
- Hard to work with both in person and online and keep it engaging for both groups
- The playbook was a great resource, advise was to advertise it more
 - Will be sending to TIM attendees as follow up email
- Good to see good management attendance
- Executive summary
 - Announced during Agile TIM
 - No formal review is needed, feedback is welcome and will update as needed
 - David will post in Teams channel
- Open tickets:
 - Agile roles - Daniel will work on it this week, to be able to send it as part of the follow up email to TIM attendees
 - Metrics plan - Denise started a list of who is doing what Agile projects across the Agency, this will benefit both Agile CoP and NASA 2040
- Next month webinar, 6/7
 - Jacky will be out first week of June, Alex will be hosting June monthly
 - Jacky will reach out to INCOSE contact; if unavailable will be discussing tooling teams use in their Agile projects (working meeting, not webinar)
 - Denise has a contact for the July webinar she will be reaching out

6/21/2024 Planning Meeting

- Metric Report
- Chris Edwards moving to HQ, looking for a LaRC replacement for the end of the period
- Reviewed actions in planner
- Roles feature ready to roll out, Daniel will send to Teams channel, Jacky will send as part of TIM follow-up email, there will be a quick demo on this at next webinar session.

8/2/2024 Planning Meeting

- Review of year report
- Status of IAC paper
- Next year leadership transition

Appendix C Resources Shared by CoP Members

External Agile Orgs

- INCOSE Agile & SE WG <https://www.incose.org/incose-member-resources/working-groups/transformational/agile-systems-se>
- ISO Core Agile Practices <https://www.iso.org/standard/82692.html>
- Action: Create a list of Agile networks per region/center (CoP center rep to add)

NASA Courses

- Agile Foundations: Agile Fundamentals (available on SATERN). Good for new to Agile.
- Agile training section under the Digital Academy menu on the top of SATERN (developed by OCIO).
- Product Management (PO, Coach), Scrum Master

Certification Vendors

- ICAgile <https://www.icagile.com/>
- Scaled SAFe <https://scaledagile.com/>

Agile Tools

Approved by NASA

- Jira (with license)
- GIT (with license)
- MURAL
- digital.ai Agility
- <https://github.com/OpenMDAO/POEMs>
- <https://openmdao.org/>

Articles

- The value of improved ROI through earlier delivery (should be part of the primer) <https://www.pmi.org/learning/featured-topics/agile>
- [Government - Scaled Agile Framework](https://scaledagileframework.com/agile-contracts/)
- <https://scaledagileframework.com/agile-contracts/>
- Scaled Agile Framework (SAFe), the Team Coach concept, or scaling Agile to a Team of Agile Teams which are synchronized in their Value Delivery: <https://scaledagileframework.com/scrum-master-team-coach/>
- Scrum of Scrums: <https://www.atlassian.com/agile/scrum/scrum-of-scrums#:~:text=Scrum%20of%20Scrums%20is%20a,%2C%20and%20adaptation%2C%20at%20scale.>
- NASA using Agile methods in the 50s: <https://intenseminimalism.com/2012/a-brief-history-of-agile-methods/>
- Guide for determination of project type: [How to Determine Projects Fit for Agile — Tech at GSA](https://www.gsa.gov/tech/2018/04/how-to-determine-projects-fit-for-agile)
- Adding enterprise syncs to your LPM adoption: <https://www.agilerising.com/blog/adding-enterprise-syncs-to-your-lpm-adoption/>
- Defining user stories for our software teams: <https://www.linkedin.com/pulse/my-user-story-template-jacob-weidokal-0u9kc/>
- [This article is a good quick read](#) at how to modify/make phase gate reviews more valuable and adaptable.

From other Agencies

- GSA Agile Tech Guides: <https://tech.gsa.gov/guides/#agile+api+design+development+devsecops+team>
- 18F Agile Principles: <https://agile.18f.gov/>
- 18F Derisking Guide: <https://derisking-guide.18f.gov/>
- GAO's Agile Assessment Guide: Best Practices for Agile Adoption and Implementation: <https://www.gao.gov/products/gao-20-590g>

Books

- Doing Agile Right: Transformation Without Chaos by Darrell Rigby, Sarah Elk, Steve Berez. NASA Library [Audio - https://nasa.skillport.com/skillportfe/main.action?path=summary/AUDIO_BOOKS/154219](https://nasa.skillport.com/skillportfe/main.action?path=summary/AUDIO_BOOKS/154219)
- Scrum: The Art of Doing Twice the Work in Half the Time by Jeff Sutherland. NASA Library [Audio - https://nasa.skillport.com/skillportfe/main.action?path=summary/AUDIO_BOOKS/102562](https://nasa.skillport.com/skillportfe/main.action?path=summary/AUDIO_BOOKS/102562)

- The Phoenix Project: A Novel about IT, DevOps, and Helping Your Business Win by Gene Kim, Kevin Behr, George Spafford. NASA Library
 Digital - <https://nasa.skillport.com/skillportfe/main.action?path=summary/BOOKS/142715>
 Audio - https://nasa.skillport.com/skillportfe/main.action?path=summary/AUDIO_BOOKS/142708
- The Age of Agile by [Stephen Denning](#). NASA Library
 Digital - <https://nasa.skillport.com/skillportfe/main.action?path=summary/BOOKS/137968>
 Audio - https://nasa.skillport.com/skillportfe/main.action?path=summary/AUDIO_BOOKS/134943
- Recoding America by [Jennifer Pahlka](#)
- Turn the Ship Around! How to Create Leadership at Every Level by David Marquet. NASA Library
 Digital - Summary of the book <https://nasa.skillport.com/skillportfe/main.action?path=summary/BOOKS/125610>
- The Five Dysfunctions of a Team: A Leadership Fable by Patrick Lencioni. NASA Library
- Audio - https://nasa.skillport.com/skillportfe/main.action?path=summary/AUDIO_BOOKS/46933
- Project to Product: How to Survive and Thrive in the Age of Digital Disruption with the Flow Framework by Mik Kersten. NASA Library
 Digital - <https://nasa.skillport.com/skillportfe/main.action?path=summary/BOOKS/144158>
 Audio - https://nasa.skillport.com/skillportfe/main.action?path=summary/AUDIO_BOOKS/144192
- Fixing your Scrum Practical Solutions by Ryan Ripley and Todd Miller.
- Deep work: rules for focused success in a distracted world by Cal Newport.
- Process/Method/Tools/Environment from James Martin's book is a good framework to define SE methodologies, and help us make sure that tasks are aligned with the ISO lifecycle processes/NASA SE engine material.
- [Harley's lean manufacturing process](#). A quote from that book, "There was in fact no correlation between exiting phase gates on time and project success ... the data suggested the inverse might be true."

Channels/Podcasts

- SaFE: <https://teams.microsoft.com/l/team/19%3ac50eaec17e344c3893e8fef866424681%40thread.tacv2/conversations?groupId=af53e3cc-79c7-471c-af50-68d8c1a570e4&tenantId=7005d458-45be-48ae-8140-d43da96dd17b>
- Leading Agile: <https://www.leadingagile.com/podcast/>
- Agile Coaches Corner: <https://agilecoachescorner.libsyn.com/>
- Agile Toolkit Podcast: <https://agiletoolkit.libsyn.com/>
- Agile for Humans: <https://ryanripley.com/agile-for-humans/>



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14. ABSTRACT
This 2023-2024 report provides a comprehensive summary of the products and activities executed by the NASA Agile Community of Practice over its first year from being formally stood up. The report highlights the community's ongoing efforts to advance Agile values and principles, improve practices, and foster innovation within teams across NASA centers. The report delves into key initiatives, including the development of a strategic plan, executive summary, and best practice guidelines; as well as the facilitation of knowledge-sharing events such as webinars with internal and external speakers, workshops, and technical interchange meeting.

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