Group #9: Community of Interest on the Future of Scientific Methodologies

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| Date | November 2, 2020 |

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1 Day One - November 2, 2020

1.1 Breakout 1 - Define the Scope of the Problem.

**Question or instruction for the discussion:**
Breakout 1 - Define the Scope of the Problem.
The purpose of this session is to lay the foundation for the next 5 sessions. That is, each breakout group will define a key piece of technology, a new device, or methodology that would have an impact on how the labs/scientists operate. The details should include answers to the questions below.

**Sticky points:**

 Top Takeaways (5 points per participant)

* What is the problem, issue, technology, device, methodology?
	+ (2) Interdisciplinary collaboration: breaking down disciplinary silos (#2)
	+ (1) Flexible/agile collaboration: move to a less predetermined/structured so researchers are involved as best fit, lesser barriers for integration with data/tools/resources, better legal/org structure to support that (#4)
	+ How do you support collaboration on a global scale? language and time zone barriers (#5)
	+ (1) Reducing the start-up time needed for productive, interdisciplinary collaborations. (#6)
	+ (1) How to start from problem being solved and work backwards to teams that are needed (including new capabilities or bridging facilitators), rather than starting from existing capabilities and declaring they apply to the problem (#7)
	+ issues with domain-specific knowledge and bridging those silos and shortening the time to understanding (#8)
	+ Interagency collaborations: breaking down the "ownership" problem (#9)
	+ (3) How to facilitate disruptions in collaborations, to move to thinking out of the box? (#10)
		- Cultural/disciplinary barriers to accepting disruptive change (#36)
			* both at the global scientist level but also with the culture of discipline (#37)
			* This is more about getting people to engage many different disciplines in the brainstorming process to think out of the box. (#38)
	+ Massive data stores: how to get access to them (from other projects, labs, agencies, industries), and how to actually get them onto DOE hardware for compute (#11)
	+ DOE laboratory structure hinders cross laboratory collaboration (#12)
	+ Solve data "translation" problem - relevance, usefulness beyond first imagined. (#13)
	+ quality control in citizen science (data, understanding) (#14)
	+ Need for specific "mediator" staff who are good at bridging disciplines? (#15)
	+ Supporting the dynamic aspect of collaborations, that change over time. (#17)
	+ Need mechanisms to engage citizen science as appropriate. (#18)
	+ Integrated with cyber/trust work and its application to ensure broad collaborations scale well across organizations/security structures (#19)
	+ (1) simplifying access to resources, current barriers require many forms and reviews (#20)
	+ How to bring new staff into an interdisciplinary culture, rather than bringing them up within a discipline initially and then expecting them to branch out after ways of thinking are set? (#21)
	+ (3) expansion of userbase at computing facilities, support higher-level tools (think scratch for grade school students access to programming) (#23)
		- expand to domains that are not traditionally steeped in HPC (#39)
		- increasing accessibility to other areas/disciplines (#40)
		- High-level "modeling programming language" for integrating models and data? (#41)
	+ (1) allowing for failures in collaborations without penalty or judgement (#28)
	+ (1) How do we define success? What are the metrics for success? (#31)
* Who would develop it (basic research to advanced deployment)?
	+ It is important for the users to be involved in the development. The issue is that the users can change over time. Need to allow for the dynamic changes with the users. (#22)
	+ Lab invests in sustainable products and brings in skill set to develop and maintain stacks to support collaboration (#35)
* Who would use it and what skills would they need to use it effectively?
	+ Can be used across different science domains as well as facilities. (#24)
	+ Also citizens can be engaged in the collaborations. (#26)
	+ (1) Ensure adoption by researchers across domains, past the HPC community. Needs expertise from UX researchers and HCI to build such platforms to reduce time to adoption and use. (#29)
		- not topics DOE traditionally supports but really really needed for the future - accessibility (#48)
	+ Increasingly stakeholders or consumers of science as active users, not just DOE scientists (#30)
* When would it be expected to be in production use (N years in the future)?
	+ This is hard to determine. (#27)
	+ (1) This is a cultural change, may be slow (#33)
		- success accelerates change/shift (#44)
	+ As you have successes, people may be open to come around to change. (#45)
	+ DOE "incubator" support for teaming in different ways (#46)
	+ Providing details about how a group achieved success. (#47)
* Where, and how widely, would it be deployed?
	+ The collaborations can be global. (#1)
	+ (1) It is important to facilitate international collaborations and data sharing. (#3)
	+ Also, can engage citizen science, which means some education is needed for broad audience. (#34)
		- or technology needs to intervene to aid in the process (#43)
* What is the setup time and/or process for using it?
	+ (2) shorten time to collaboration startup (#16)
	+ access to both data and resources (#25)
	+ (1) More integrative computational/software frameworks for easing collaborative science (rather than making more complex burden) (#32)
		- imbed collaboration in the frameworks (#42)
* Summary and notes

1.2 Breakout 2 - Implications of this Problem.

Participants: 0

**Question or instruction for the discussion:**
Breakout 2 - Implications of this Problem.
Each group will now develop a list of issues and implications for the issue/technology/community they settled on. There are lots of implications for how a technology can be used, or further developed.

**Sticky points:**

 Top Takeaways (5 points per participant)

* What other/companion technologies, services, software/hardware must also be developed and deployed?
* Who is/will develop this companion technology/service?
* What skills/knowledge does the end user require?
* What are the training/support requirements?

1.3 Day 1 Reflections

Participants: 0

**Brainstorm question or instruction:**
Day 1 Reflections
This area is for the Moderator to note key discussion points to summarize what was accomplished in Day one. Remember that day one is focused on Identifying a new technology or methodology and identifying the implications and possible consequences of it. The moderator can populate this individually at the end of the day or request input from the group here.

