



TECH NOTES

Building a Community of Practice for Major and Mid-scale Facilities

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Overview

This Tech Note documents eight strategies and best practices for building a Community of Practice (CoP) among professionals working at Major and Mid-scale Facilities (MFs) funded by the U.S. National Science Foundation (NSF). The insights are derived from interviews conducted with MF and cyberinfrastructure (CI) professionals, focusing on collaborative learning, knowledge sharing, and community building to enhance the CI ecosystem.

Introduction

A Community of Practice (CoP) is defined as a group of people who share a common interest, profession, or passion and actively engage in collaborative learning and knowledge sharing (Wenger, 1998). CoPs are vital for fostering a sense of belonging, facilitating knowledge exchange, and driving innovations within a community.

This Tech Note explores the importance of building a CoP among the NSF MFs. It examines the current state of CoPs within the MF community, and presents strategies for developing and sustaining a robust CoP. By fostering collaboration, support, and resilience, a well-established CoP can significantly enhance the success and sustainability of NSF MFs.

Research Methodology

To gather insights, we conducted qualitative interviews with MF professionals in 2023. We conducted 23 Zoom interviews with professionals across 18 different organizations. Nine were from Major Facilities, three were from Mid-scales, and eleven were from other non-MF organizations. The interviewees included 13 directors/managers, four project staff, three technical staff, and three scientists. The interviews ranged from 29 to 65 minutes per interviewee, averaging 48 minutes.

When we anonymized the interviews, we labeled them with an alphanumeric code system (e.g., CIC001, CIC002, CIC003) to identify the interviewees. “CIC” stands for “CI Compass” and “002” means the second interview in the dataset. In this Tech Note, we use short interview excerpts to illustrate the strategies and best practices discussed.

Findings

Importance of Building a CoP

Question 1: Why is building a CoP for MFs important?

Learn from Others: Leveraging the experience of established MFs can be invaluable, especially for newer facilities and the larger research infrastructure community overall. Regardless of history, every MF can learn from each other. Interviewees shared:

- *"There's a lot that we can learn from each other... learning from other people's successes, what worked for them... different challenges." (CIC013)*
- *"People have come before us, and there will be people after us. Maybe they made the same mistakes, and we can learn from them." (CIC009)*

In other words, the first reason to cultivate an MF community is to create a place where peer learning in the MF community can take place organically.

You Don't Know When You Need a Community: The value of a community often becomes evident during a crisis or unexpected challenge. Having a support network can provide much-needed resources and advice during a difficult time. Interviewees told us:

- *"It's always helpful to have a community of practice. You don't know why you're going to need it, but when you need it, you'll be happy it's there." (CIC002)*
- *"In many ways, you actually mitigate risk much more [and better] by depending on each other". (CIC008)*
- *"When opportunities arise, [people] volunteer or support each other." (CIC009)*

Building a CoP is vital for leveraging the human capital and offering support during crises, highlighting the need for a strong support network for ongoing learning and resilience.

Strategies for Building a CoP

Question 2: What strategies can help build a CoP for MF professionals?

Identifying Common Interests/Challenges: Common interests or challenges, such as cloud computing, cybersecurity, and long-term data storage, can bring the community together. For example, many MFs faced similar challenges regarding data archiving and network bandwidth, which provided a common ground for discussion and collaboration. Interviewees noted:

- *"To create a community of major facilities [... there should be] regular meetings to discuss items of concern to major facilities." (CIC017)*

- *"[There are] opportunities to improve sharing, resources needed to work together and find common solutions." (CIC022)*
- *"[We have been] successful at building a sense of community among the people dealing with cybersecurity." (CIC023)*

Identifying these shared challenges (e.g., cybersecurity) helps unite the community and provides a platform for collaborative solutions.

Promoting Knowledge Sharing: Encouraging the exchange of information, best practices, and experiences among community members. Regular virtual meetings and collaborative platforms can facilitate knowledge sharing. Interviewees added:

- *"At conferences, people happily share what they've done, their mistakes, and lessons learned." (CIC010)*
- *"I think the community building work is important, like... the various major facility meetings... [When] the room kind of breaks up into a couple of huddles... four or five or three... I do think those community building exercises are worthwhile because it does build communities." (CIC022)*
- *"[CI Compass provides] a forum for MFs to share how they solve problems and build solutions." (CIC010)*

Promoting knowledge sharing through these methods enhances the exchange of best practices and experiences, fostering a culture of continuous learning and improvement.

Organizing Guest Sessions: Inviting experts and experienced community members to share their insights and knowledge through webinars, workshops, and guest lectures. For example, CI Compass has organized guest sessions featuring experts from various MFs to discuss topics like data management and cybersecurity (Baldin et al., 2024). Interviewees commented:

- *"Everybody wants to know what everybody else is doing." (CIC015)*
- *"When you ask people to come and help at a workshop, generally they come and show up,... they're very open to sharing." (CIC006)*
- *"Community of practice meetings with a regular forum are critical." (CIC023)*

Organizing guest sessions with experts helps disseminate valuable knowledge and insights, contributing to community learning and development.

Providing Networking Opportunities:

Organizing conferences and workshops can facilitate networking among MF professionals, allowing them to connect, collaborate, and build relationships. Interviewees stated:

- *"CI Compass and [their] meetings ... allowed me to be introduced to the other facilities. So, for me, that's the only way I really feel connected to the other facilities is through CI Compass, because that's where I meet them."* (CIC002)
- *"Working groups and connections with people across MFs have helped crystallize strategies."* (CIC005)

These networking opportunities enhance collaboration and relationship-building, thereby boosting overall community engagement, including identifying and crystalizing strategies on common challenges.

Creating an Inclusive Environment: Ensuring that all members of the community feel valued, respected, and included. Efforts have been made to include diverse voices and perspectives in community activities, fostering an inclusive environment. Interviewees said:

- *"[It is important to] include diverse voices and expertise to solve new problems."* (CIC010)
- *"Outreach and communications people [can] reach out to novice users [to include their feedback]."* (CIC006)

These efforts help ensure that all community members feel valued and respected, fostering a supportive and collaborative atmosphere, including novice users for their feedback.

Facilitating Collaborative Projects/Initiatives:

Encouraging joint projects that address common challenges and leverage collective expertise is crucial. Identifying projects that can benefit from collaboration and providing resources to support these initiatives is essential. Interviewees recounted:

- *"CI Compass was created to drive organization and collaboration."* (CIC009)

- *"[because] joining groups like CI Compass... [M]y experience with my collaborators from major facilities initially have led to friendships, and those have led to further science opportunities together."* (CIC006)

Facilitating these collaborative projects enhances problem-solving and leverages collective expertise, driving innovation and efficiency.

Exploring New Partnerships:

Seeking partnerships with other organizations with the NSF-funded MFs to expand resources and knowledge is essential for building a CoP. It helps to proactively look for opportunities to collaborate with institutions that have complementary strengths and goals. Interviewees explained:

- *"NSF could provide a superstructure of common resources between MFs."* (CIC021)
- *"Everybody takes some responsibility for reaching out to counterparts."* (CIC011)

Exploring new partnerships with organizations expands resources and knowledge, fostering innovation and collaboration within the community. Funding agencies such as the NSF could also encourage such activities.

Having a Community Facilitator:

Organizing a community is not an easy task. An enduring structure does not always emerge by chance. Having a community facilitator or a facilitator team can be helpful and make this effort more intentional. Interviewees suggested:

- *"There has to be a mandate to think about sustaining and growing the community."* (CIC010)
- *"[T]o efficiently [and] quickly... create an MF community, I think that there would need to... include some kind of [a] community manager, [responsible for] ... making sure people are connected at the right level with the right roles and responsibilities... It probably involves a couple of other people who would be conduits and could be at least 50% time to do that role".* (CIC011)

Having a community facilitator or a facilitator team would ensure that the community building

effort is intentional and ongoing, not based on inconsistent volunteer efforts. The MF community can thrive when there are leaders who are willing to do the organizing work. At present, CI Compass plays such a facilitator role.

Next Steps

Quantify Community Engagement:

Conduct comprehensive surveys to measure the level of community engagement among MFs. These surveys should assess various aspects of engagement, including participation in activities, collaboration on projects, and the sense of community among members. This data will help identify areas of strength and opportunities for improvement.

Rate and Rank Strategies:

Analyze the survey results to rate and rank the effectiveness of different community-building strategies. By understanding which strategies are perceived to be more important, we can prioritize and focus on implementing the most impactful ones. This ranking will provide a clear roadmap for enhancing community engagement.

Implement and Iterate:

Based on the insights gained from the surveys and the ranking of strategies, implement the top-rated strategies. Monitor their effectiveness and continuously iterate on these approaches to ensure they remain relevant and effective. Regular feedback loops will help make necessary adjustments and maintain the momentum of community-building efforts.

Conclusion

Building a Community of Practice (CoP) among MF professionals is essential for fostering collaboration, sharing knowledge, and addressing common challenges. The eight strategies and best practices identified in this tech note provide a comprehensive framework for developing and sustaining a vibrant community supporting the ongoing mission of the NSF Major and Mid-scale Facilities. By

quantifying community engagement, rating, and ranking strategies and continuously implementing and iterating on these strategies, we can ensure that the CoP remains dynamic, inclusive, and effective. This approach will enhance the professional growth of MF members and drive innovation and efficiency across the entire community, ultimately contributing to the success and resilience of NSF Major and Mid-scale Facilities.

References:

Baldin, I., Brower, D., Butcher, D., Casey, R., Clark, C., Deelman, E., Flynn, B., Hasan, M., Kee, K., Livny, M., Mandal, A., Murillo, A., Nabrzycki, J., Pascucci, V., Petruzza, S., Romsos, C., Stanzione, D., Vahi, K., & Virdone, N. (2024). 2024 Cyberinfrastructure for U.S. NSF Major Facilities Workshop Report (1.0). Zenodo.
<https://doi.org/10.5281/zenodo.11372561>

Wenger, E. (1998). Communities of practice: Learning as a social system. *Systems Thinker*, 9, 2-3.