

Overview

This work explores the development and implementation of Communities of Practice (CoP) within “Big Science” Organizations. A CoP is a group of professionals who share a common interest, profession, or passion and actively engage in collaborative learning and knowledge sharing (Wenger, 1998).

In the context of “big science” (e.g., large-scale observatories), a CoP plays a crucial role in fostering collaboration, enhancing knowledge exchange, and driving innovation across multiple facilities, especially in the domain of cyberinfrastructure (CI). Based on 23 interviews conducted with directors, project staff, technical staff, and scientists across various “big science” organizations funded by the National Science Foundation (NSF) called Major and Mid Scale Facilities (M& MFs), we used the grounded theory approach (Corbin & Strauss, 1990) as our method to analyze the data.

Strategies for Building a CoP

What strategies can help build a CoP for M&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.

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.

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 M&MFs to discuss topics like data management and cybersecurity (Baldin et al., 2024).

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

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.

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.

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.

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.

References:

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Corbin, J. M., & Strauss, A. (1990). Grounded theory research: Procedures, canons, and evaluative criteria. *Qualitative sociology*, 13(1), 3-21.

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



The Rubin Observatory (left), a Regional Class Research Vessel (middle), and the Antarctic Infrastructure Modernization for Science’s Vehicle Equipment and Operations Center (right).

Source: Rubin Obs/NSF/AURA (B. Stalder, left); National Science Foundation (middle); National Science Foundation (right). | GAO-24-107044