Towards a Hybrid Model of Communication & Organizing in the Modern Workplace

Michelle Williams, Mona Sleiman, Christian Keroles and Kerk F. Kee
COM-491: Spring 2015, Chapman University; Orange, Calif.

Introduction

As communication technologies are advancing and breaking down geographical borders, dispersed experts can now virtually collaborate, especially within big data projects in science and engineering. Virtual organizations enable e-science projects to bring dispersed experts together to maximize the knowledge available in order to solve real world problems (Lee, Dourish & Mark, 2006). It is apparent that modern, internet-based communication mediums promote symbiotic relationships between remote parties as well as impact their subsequent productivity (Sooryamoorthy & Shrum, 2007). Past research has also concluded that face-to-face interactions generate emotional energy, group solidarity, and group social cohesion among members (Hackett et al., 2008; Yuhyung & Kyojik, 2011) and that these social interactions lead to durable bonds and productive group behaviors (Collins, 1998; Durkheim, [1893] 1997). With this knowledge in mind, it is imperative to investigate how combining these two approaches will affect the working relationship, the productivity and the quality of results produced.

Literature Review

The question of whether e-science is a legitimate form of research has shifted to the question of how it can be successfully implemented in contemporary science and engineering. Research has highlighted that the true valuable outcome in this line of work is a trained individual, rather than the software itself (Gewaltig & Cannon, 2014). By minimizing the various barriers, latent synergy between developers and users will be maximized. Such a synergy is conducive to the development and maintenance of relationships between teams (Wessels & Craglia, 2007). Essentially, positive working relationships within big data science projects can be formed and maintained in order to promote collaboration and maximize organizational capacity.

Prior research has been inconclusive to the effects of face-to-face collaborations. Walsh and Mahoney (2007) indicate the important role of face-to-face meetings, in that these interactions allow for the maintenance of integrity of the collaboration. Opposite of face-to-face communication, computer-mediated communication and the use of Internet-related technologies facilitate collaborations (Walsh & Maloney, 2007); however, such technological channels can also be problematic in that composition can be time-consuming (Walsh & Mahoney, 2007). The juxtaposition of these two channels indicates that neither one is overwhelmingly satisfactory; this realization implies that a new solution should be implemented in order to improve collaboration efforts. The current study aims to examine the effects of creating a hybrid model of communication and organizing. We ask the research question, *"How can different forms of communication be utilized to enhance collaboration between dispersed experts within e-science projects?"*

Methodology

This poster employed the grounded theory approach (Corbin & Strauss, 1990), analyzing 40 interviews conducted with domain scientists (e.g. bioinformatics, computational chemistry, theoretical physics) and computational technologists. Participants were from across the US (including CA, IL, IN, SC, MI, TX, etc.) and a small portion were from the UK (Scotland). Interviews were conducted either in person or by telephone. Following the interview guided by an established protocol, the co-authors performed multiple iterations of data analysis and literature integration, yielding preliminary findings presented in this poster.

Findings

Face-to-Face Interactions

Face-to-face and nonverbal communication is essential for building trust in social interactions. In-person interactions allow groups to come together and establish rapport and shared understandings, which facilitates efficient collaborations. The benefits of establishing these bonds catalyze synergistic working relationships.

- "We're human beings, and we're in a physical world; we have bodies, and body interactions with the world and with each other. And so virtually all of these media that mediate us, as opposed to direct face-to-face, are very loss-y." (Administrator, IL, 7/15/14)
- "One of the biggest challenges with working with virtual organization, simply by the fact that it's virtual…you miss out on a lot of stuff that can occur in face-to-face communication... So, often things will be overlooked and that can lead to problems later." (Bioinformatics Researcher, California, 3/19/14)
- "We would try to co-locate and then... work together, for a few days... And we find opportunities to do that… as often as possible, because the physical presence matters quite a lot." (Computational Scientist, Illinois, 11/20/13)

Virtual Interactions

Dispersed experts must come together to solve grand challenges, regardless of geographical, institutional, or disciplinary separations. The growth of virtual communication technology facilitates collaborations between these unique parties as they overcome barriers of coordination. In the shift to these new approaches of organizing, groups must evolve and develop strategies to maximize efficiency in this virtual model.

- "Fifteen years ago, there was no question of virtual organization, rather fly somewhere. Now you can do a Google hang out, or Skype and this and that." (Computational Scientist, CA, 7/17/14)
- "We just all remotely work on stuff…and it's just like you're working in the same place but you're not… So the key objects for making this work are the collaborative tools we use…it's the fact that we can actually do it really easily now…overall the collaborative tools that are available to us now make it really quite easy to just sit around the table and using Skype and chat, despite somebody's being in northern Sweden." (Project Manager, UK, 11/18/13)
- "Some software development attracts more introverted people, and so they tend not to want to do the face-to-face communication, but they can still do online communication. I find that for some reason that's fine; you can talk to millions of people simultaneously through a website but not in person face-to-face." (Director, UK, 11/18/13)
- "One way of looking at that might be standardize the interfaces between geographically distributed teams to allow them to cooperate more fluidly, or it might be between kind of domain-distinct teams as well even though those teams themselves are geographically distributed." (PI/Director, UK, 11/18/13)

Hybrid Models

The benefits of both face-to-face and virtual interactions are evident; however, community members should fuse the two mediums in order to maximize productivity and efficiency through a hybrid model of communication. Although the demands of the community require dispersed parties to collaborate virtually, face-to-face interactions still prevail as the ultimate means to establish trust and credibility. With a hybrid model, collaborators can lay the foundation to be productive when they connect face-to-face and then reconnect via technologies.

- "I have had some experiences with researchers who have come for a workshop, I have met with them in person, I have understood their problems face-to-face, and then it's much easier to get things going after that, after you can sit down and figure out exactly what the problem is or what you need to do and you can make sure you are on the same page and then continue via email." (Computational Chemist, TX, 4/23/14)
- "I am also a strong believer in regular – at least initial – face-to-face meetings. It can't be done; you don't build relationships with purely Skype calls or video conferencing. It's the social side; building the teams that understand what you're trying to do that really buy into it. If you don't have real support and understanding of the people you're working with on the ground, it's pointless. It really is." (Director, IL, 11/20/14)
- "It really helps if people know each other and they either know each other because they've worked together in the past. Or if you can have, for example, an annual user conference where people can meet or you can have some kind of kick-off meeting or workshop, so things that are face-to-face meetings, I think, are really great ways to form small teams. And after people meet in person, they're more likely to be able to go geographically distributed and work together." (Senior Research Scientist, IN, 12/4/14)
- "For something that might be a little more specialized, like software in a particular domain, I think face-to-face interaction every now and then is good. Some of these projects will have what they call code-athons or hack-athons where they get these developers together and they might spend a really intense few days or a week working together on the software." (Administrator, CA, 11/13/14)

Conclusion

Although more research is necessary to understand the longitudinal effects of creating a synergistic model of collaboration, it is clear that such a hybrid model appropriately combines rich face-to-face and efficient virtual communication to maximize synergy. The degree to which each medium is utilized depends on the type of project and the relationship that exists between the involved parties; thus a hybrid model would manifest as a spectrum in which the level of either face-to-face communication or virtual organizing could oscillate. More specifically, face-to-face communication should be used when the goal is to establish and strengthen trust and credibility. On the other hand, virtual communication should be used when the goal is to overcome geographical separations. It is clear that organizations could benefit from a customized and flexible model of communication which combines both face-to-face communication and virtual organizing to best meet their needs and objectives.

References

Collins, R. (1998). *The sociology of philosophies.* Cambridge, MA: Harvard University Press.

Durkheim, E. ([1893] 1997). *The division of labor in society.* New York: Free Press.

Gewaltig, M.-O., & Cannon, R. (2014). Current practice in software development for computational neuroscience and how to improve it. *PLoS Computational Biology, 10*(1), e1003376. doi:10.1371/journal.pcbi.1003376

Hackett, E. J., Parker, J. N., Conz, D., Rhoten, D., & Parker, A. (2008). Ecology transformed: The National Center for Ecological Analysis and Synthesis and the changing patterns of ecological research. In Olson, G. M., Zimmerman, A., & Box, N. (Eds.) *Scientific collaboration on the Internet* (pp. 278-296). Cambridge, MA: MIT Press.

Lee, C. P., Dourish, P., & Mark, G. (2006). The human infrastructure of cyberinfrastructure. In P. Hinds & D. Martin (Eds.), *CSCW '06: Proceedings of the Conference on Computer Supported Cooperative Work,* (pp. 483-492). New York: ACM Press.

Sooryamoorthy, R., & Shrum, W. (2007). Does the Internet promote collaboration and productivity? Evidence from the scientific community in South Africa. *Journal of Computer-Mediated Communication, 12*(2), 733-751.

Walsh, J. P. and Maloney, N. G. (2007), Collaboration structure, communication media, and problems in scientific work teams. *Journal of Computer-Mediated Communication,* 12: 712–732. doi: 10.1111/j.1083-6101.2007.00346.x

Wessels, B. and Craglia, M. (2007), Situated Innovation of e-Social Science: Integrating infrastructure, collaboration, and knowledge in developing e-Social Science. *Journal of Computer-Mediated Communication,* 12: 692–711. doi: 10.1111/j.1083-6101.2007.00345.x

Yuhyung, S., & Kyojik, S. (2011). Role of face-to-face and computer-mediated communication time in the cohesion and performance of mixed-mode groups. *Asian Journal of Social Psychology, 14*(2), 126-139. doi:10.1111/j.1467-839X.2010.01341.x