Towards a Hybrid Model of Communication & Organizing in e-Science
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Methodology
This poster employed the grounded theory approach (Corbin & Strauss, 1990), analyzing interviews conducted with domain scientists (e.g. researchers in bioinformatics, computational chemistry, theoretical physics) and computational technologists. Participants were from across the US (including CA, IL, SC, MI, TX, etc.) and a small portion were from the UK (i.e., 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
• Throughout the coding process, three common themes were found within:

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 familiarity, 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 bodies interact 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 lossy.” (Administrator, IL, 7/15/14)

• “One of the biggest challenges with working with virtual communication, simply by the fact that it’s virtual…you miss out on a lot of the things that can come face-to-face communication...So, often will be overlooked and that can lead to problems later.” (Bioinformatics Researcher, CA, 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, IL, 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 remEDIATE 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 more innovative 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.” (Administrator, 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 that kind of domain-distinct teams as well even though those teams themselves are geographically distributed.” (PDirector, 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 virtual model necessitate the virtual, 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 reconnected via technologies.

• “I have had some experiences with researchers who have come for a workshop; I have met with people 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 and what you need to do and you can make sure you are on the same page and then continue via email.” (Computational Chemist, TX, 4/2/14)

• “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 face-to-face meetings that the teams understand that 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.” (Administrator, IL, 11/11/14)

• “It really helps if people loosen 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 think-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 organized face-to-face meetings and then is good. Some of these projects will have what they call code-a-thons or hack-a-thons where they get these developers together and they might spend ten to fifteen 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


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