

## The Profession of IT Orchestrating Coordination in Pluralistic Networks

*Learning to build virtual teams of people of diverse backgrounds is an urgent challenge.*

**L**ONG THE BANE of organizations and teams, coordination breakdowns can be expensive, wasteful, mission killing, and sometimes life threatening. They manifest as miscommunication, misunderstandings, ill-timed actions, wasted motion and resources, and performance-killing bad moods. A plethora of coordination technologies seeks to overcome these problems and enable virtual teams, but coordination breakdowns have become more common and more severe in virtual teams. Exquisite coordination, which separates high performance teams from the rest, is an ever more elusive goal.

The core of the challenge is that the team members are drawn from pluralistic networks—people from different countries, cultures, backgrounds, worldviews, and practices. This diversity of value sets makes coordination all the more difficult.

Recent disasters have made the pluralism issue publicly visible. Despite all the good they did, the groups gathered for humanitarian assistance encountered systemic inabilities of government and non-government organizations to coordinate well, leading to delayed responses, wasted resources, and additional lost lives. Examples appeared during the 9/11 attack in New York City, the 2004 tsunami in the Indian Ocean, and the 2005 Hurricane Katrina in the U.S.<sup>2</sup>

Disaster relief teams have an addi-



**World of Warcraft** screen depicting avatars.

tional problem: they are often under overwhelming stress. The tendency of teams to move toward dysfunction under stress regularly deepens disasters, loses wars, and sinks companies. Pluralistic worldviews exacerbate the stress because they add obstacles to coordination when there is no time to deal with them.

Interestingly, it appears that computing people have a great deal to contribute to the solution of this problem. They know how to design and build computational tools that facilitate conversational protocols, and collect, analyze, and present complex data in a form that facilitates decision-mak-

ing. Prototypes of these tools appear in MMOGs (massively multiplayer online games). The challenge for computing people is to help understand the coordination skills for pluralistic networks and then design tools to enable diverse communities to quickly form effective teams. We will discuss the latest in a series of experiments we conducted with the *World of Warcraft* (WOW) game that leads us to be optimistic about this possibility.

### The Changing Context

Most of us have enjoyed a tradition of working in organizations with clear chains of command in fairly homog-

enous communities. This tradition, which might be called “hierarchical uniformity,” is no longer valid for many groups. Instead, many groups are confronted with what might be called “diversified nonuniformity.” In this context, teams are multicultural, deadlines are short, actions are automatic (nonreflective), decision making is distributed, leadership is earned, performance assessment is purely merit based, in-person meetings are infrequent, resources are insufficient, information is overwhelming, and sensory data is conflicting.

It is no surprise that hastily formed networks for disaster relief are fertile grounds for miscoordination: they violate the tradition dramatically.<sup>2</sup> Participants from hierarchical uniform organizations have little need to practice coordination in pluralistic networks. When they convene in such a network, they are unprepared to work together.

The hierarchical uniform tradition goes hand in hand with three other beliefs about effective teams. One is the notion of “best practices”: the leadership finds a “best” way to do something and requires everyone to do it that way. In our experience, this notion is incompatible with pluralistic networks. There is no one “best way” for a diversified team to accomplish its mission. It must adapt and flow with a constant stream of new possibilities.

Second is relativism, the notion that all team member worldviews are equally valid and, hence, the common ground must be found in the absence of universal values. We believe, to the contrary, that there are universal values. Seven of them motivate the practices we recommend below. For example, asking for and receiving binding commitments is universal, although the style of making requests and promises varies among cultures. Another example is that everyone believes in “do not kill any person,” although many do not hesitate to kill those whom their culture defines as “non-persons.”

Third is team stages of development, the notion that teams move through the stages that Bruce Tuckman called “forming, storming, norming, and performing.”<sup>9</sup> This is useful guidance for leaders of relatively homogenous teams. In pluralistic networks, the for-

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mation of leadership itself becomes a central concern. There is no externally appointed leader who can guide the team through those four stages. The team’s emergent leadership must do this by itself. The possibilities of miscommunication and dramatic mood shifts are constant threats.

### Practices for Diversified Coordination

We have been conducting experiments to understand a small but important piece of the problem: What practices do small teams need to function well in a pluralistic network? Answering this question is the first step toward building helpful computational tools.

The main issue of pluralistic networks is that the members bring different values and do not see the world the same way. We have investigated whether there are universal values that would bridge the diversity, generate mutual respect, and support everyone’s dignity. We have found seven universal values and associated practices that realize them in the team:

1. Proficiency in a practice essential to the team;
2. Capacity to articulate a vision of the team’s value in the world that others embrace and commit to;
3. Capacity to enter into binding commitments and fulfill them;
4. Capacity to spot and eliminate waste;
5. Capacity to share on the spot, real-time assessments of performance, for the sake of building and maintaining trust, including disclosures of moods and emotions inspired by the environment and action of the team;
6. Capacity to observe one’s own

history and how it interacts with the histories of the others on the team; and

7. Capacity to blend, meaning to dynamically align one’s intentions, movements, and actions with those of others.

Research and experience support the hypothesis that these practices constitute the essential core for coordination in pluralistic networks. For example, Womack and Jones<sup>11</sup> promote “lean thinking,” a practice of seeing and eliminating waste. Gladwell<sup>4</sup> reports on how airlines discovered that most accidents could be traced to cross-culture miscommunication in the cockpit; accidents dropped significantly after the airlines put pilots through multicultural communication training. Multicultural group processes such as the Barrett-Fry Appreciative Inquiry<sup>1</sup> and the Straus-Layton method<sup>7</sup> have been very successful at developing shared interpretation and solidarity in pluralistic communities. Strozzi-Heckler<sup>8</sup> reports that Leadership practices for making assessments and blending have been very effective for teams and groups. Tuomi<sup>10</sup> concluded that loosely formed volunteer networks of collaboration frequently fall into practices like these.

### An Experiment

We recently completed a four-month experiment to examine whether an MMOG could be used as a learning environment for the core practices listed here. The diversified group consisted of 28 people who did not know each other. They came from about half a dozen countries and varied professional backgrounds. The MMOG was the *WOW* game. We chose *WOW* because it is an amazingly complex synthetic world created by a social machine from the interactions of millions of players. John Seely Brown and Douglas Thomas have already brought *WOW* to the attention of the business community as a possible training ground for leadership.<sup>5,6</sup>

Within the *WOW* context, it is possible to define precisely what it means for a small team to be proficient by extending the Dreyfus definitions<sup>3</sup> from individuals to teams. The definitions enable us to measure the progress of teams toward proficiency. The game

guides players gradually up a hierarchy of 80 levels, starting from the novice level 1. Every quest (exercise) in the game is rated for the level of players allowed to undertake it.

Players who reach a sufficient level may team with others in groups for raids into “dungeons” that house powerful denizens (called “bosses”) that cannot be defeated by individuals. Successful raids are a measure of a team’s coordination proficiency under pressure. We measured team learning proficiency by the number of successful raids at each level of difficulty, and by the new actions team members were applying to their daily lives.

Each player satisfied the first practice on the list above by attaining a sufficient game level. We set up general team practices for the remainder of the list. Observers accompanied the teams in-game to monitor their coordination and coach them on their use of the general practices. The observer made sure that the team paused periodically to share their moods and honest performance assessments (practice 5 on the list); this enabled them to regenerate their shared interpretation of what they were doing.

On completion of each in-game assignment, the teams debriefed in a standard after-action assessment exercise to critique each other’s performances, reflect on their overall effectiveness, and plan new strategies for their next assignment. They also reflected on how the coordination practices they were learning would apply in their real-life worlds.

Some in-game assignments were team raids to defeat high-level bosses.



Avatar used in team-building experiment.

## The inability to achieve proficient coordination in pluralistic networks is a real problem.

One of the bosses was so tough that there was no hope for any team to survive; the purpose was to see how the teams handled their moods when faced with an impossible situation.

We observed that the general coordination practices were initially unfamiliar to most team members. Even after the first month of working together, many members had difficulties voicing assessments of their teammates. Slowly they learned that sharing performance assessments was progressively easier with practice and they overcame their aversions. Over time, the regular practice of making these assessments ceased to embarrass or to generate hard feelings. Because acting on these assessments significantly improved their team success the teams came to value them. Their mutual respect, solidarity, and team effectiveness improved markedly. By the end of the four months, teams openly wondered why they had not been using these practices at work.

In the first two months, only one of the six teams achieved solidarity and clear proficiency. We then shuffled the team members into new teams for the next two months. This time, all teams achieved solidarity and proficiency.

The experiment validated our intuition that the general practices foster proficient diversified coordination.

### Conclusion

The inability to achieve proficient coordination in pluralistic networks is a real problem. It is becoming worse as the global Internet creates more connections and more opportunities for people to work together across international and organization boundaries. Disaster relief experiences have called

wide attention to the problem, and have stimulated research into what is needed for coordination in pluralistic networks.

The universal values of articulating visions, making and fulfilling commitments, eliminating waste, sharing performance assessments, disclosing moods, observing histories, and blending, underlie an enabling core of general team practices that lead to proficiency at pluralistic coordination. The MMOG game environment is a means of engaging teams in complex tasks requiring sophisticated use of these practices in a synthetic world.

Preliminary examples of computational tools to facilitate these practices can be seen already in the *WOW* game environment. Numerous interface add-ons present situational information in easy-to-interpret formats. Group forming tools make the process of creating diversified teams ridiculously easy. Voice-over-IP tools facilitate group conversations for coordination.

Despite the preliminary nature of these conclusions, the results are sufficiently intriguing to warrant a wider discussion of how computing professionals can help with this important problem. ■

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