Helping Knowledge Networks Work

Version 1.0

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IISD contributes to sustainable development by advancing policy recommendations on international trade and investment, economic policy, climate change and energy, measurement and indicators, and natural resource management. By using Internet communications, we report on international negotiations and broker knowledge gained through collaborative projects with global partners, resulting in more rigorous research, capacity building in developing countries and better dialogue between North and South.

IISD's vision is better living for all -- sustainably; its mission is to champion innovation, enabling societies to live sustainably. IISD receives financial support from the governments of Canada and Manitoba, other governments, UN agencies, foundations and the private sector. IISD is registered as a charitable organization in Canada and has 501 (c) (3) status in the U.S.

Version 1.0

1   Introduction

At the heart of knowledge networks are people working together. Ideas are generated.
Projects proposed. Activities implemented. Learnings documented and shared to spark
new ideas and begin the cycle over again. However, these processes do not occur
automatically.   Network projects may miss deadlines, cause frustrations, and undercut
the feelings of mutual admiration and appreciation that may have attracted members in
the first place.

Joining a knowledge network entails a long-term commitment to collaborative effort.   In
order for a knowledge network to exist at all, careful attention must be given to how staff
from member organizations will interact. This attention must go beyond what tools they
will use to communicate. It must also include an appreciation for the varying
communications styles of staff in member organizations. It must include the
establishment of ground rules for responding to ideas and criticism. It must tackle the
difficult issue of managing conflict. Without attention to these details, it is impossible to
either achieve project objectives or to maintain the long-term health of the network.

The skills of forming and working within virtual teams are essential for staff working
within sustainable development knowledge networks. Unfortunately, the management
styles and systems of most civil society organisations (CSOs) constrain the effectiveness
of inter-organisational virtual teamwork. Given the rapid increase in joint projects and
collaborations for sustainable development, however, CSOs must begin to examine how
they work together across vast geographical and cultural differences. The technical
possibility of such collaboration between CSOs has created a necessity to do so in order
to remain competitive in attracting continued project funding. The introduction of new

information and communication technologies has fundamentally disrupted the work of civil society organizations.[1]

This paper focuses on the challenges faced by the formal knowledge networks with which the International Institute for Sustainable Development (IISD) works. These networks include the Climate Change Knowledge Network (CCKN)[2], Trade Knowledge Network (TKN)[3], and Sustainable Development Communications Network (SDCN)[4]. These networks are international in membership and rely on virtual teams for the development of collaborative projects and communications activities.

1.1   Virtual teams

A virtual team, like every team, is a group of people who interact through interdependent tasks guided by common purpose. Unlike conventional teams, however, a virtual team works across space, time, and organizational boundaries with links strengthened by webs of communication technologies.[5] Working across numerous boundaries, however, brings with it challenges to effective and efficient project management.

Duarte and Snyder categorize the complexity of a virtual team according to the number of boundaries that the team crosses:[6]

1. Has members from more than one organization

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[1] Blau, Andrew. *More Than Bit Players: How Information Technology Will Change the Ways Nonprofits and Foundations Work and Thrive in the Information Age*. Surdna Foundation. http://www.surdna.org/documents/morefinal.pdf (May 2001)

[2] Additional information about the CCKN is available online at http://www.cckn.net/

[3] Additional information about the TKN can be found online at http://www.iisd.org/tkn/ .

[4] Additional information about the SDCN can be found online at http://www.sdcn.org/

[5] Lipnack, Jessica and Jeffrey Stamps. *Virtual Teams: Reaching Across Space, Time and Organizations with Technology*. John Wiley and Sons, Inc: New York, 1997. p 6-7.

[6] Duarte, Deborah L. and Nancy Tennant Snyder. *Mastering Virtual Teams: Strategies, Tools, and Techniques That Succeed*. Jossey-Bass Publishers: San Francisco, 1999. p 10.

2. Has members from more than one function

3. Has members who transition on and off the team

4. Is geographically dispersed over more than three contiguous time zones

5. Is geographically dispersed so that some team members are 8-12 hours apart

6. Has members from more than two national cultures

7. Has members whose native language is different from the majority of other team members

8. Has members who do not have equal access to electronic communication and collaboration technology.

(1-2 "yes" answers indicates some complexity; 3-5 moderate complexity; and 6-8 high complexity.)

These categories can be loosely grouped into cultural boundaries (1-7) and technological boundaries (8). It is important to note that cultural boundaries and conflicts play a larger role in virtual teamwork than technology per se. Technology merely serves to make crossing cultural boundaries easier and builds expectations that it can and should be done.

Most sustainable development knowledge network teams are highly complex. This high level of complexity makes it difficult for sustainable development knowledge networks to function effectively. In addition, member organizations are development institutions that frequently lack many of the critical success factors for participation in complex virtual teams. Most non-government organisations simply have not invested strongly in results-based human resource policies, training and development, standardised organizational policies, and communication and collaboration technology. For that reason, emerging civil society knowledge networks tend to include primarily elite institutions from around the world. These are organizations with substantial track records in individual project management that are more likely to have attracted the resources necessary for virtual teamwork.

1.2   Teams in Knowledge Networks

Knowledge networks may include two distinct types of virtual teams in their operations: management teams and project teams.   In some cases, however, there may be considerable overlap in the individuals serving in each type of team. For example, the senior researchers working on project teams within the Climate Change Knowledge Network (CCKN) are also members of the management team.

The network management team usually includes high-level representation from the member organizations and is tasked with the ongoing evolution of network objectives, strategy, membership and structure. Ideally, the management team meets periodically (1-2 times per year) to review its governance and progress on projects as well as to determine what structural issues and thematic projects should be dealt with during the next period. The network management team has relatively stable membership, thus permitting the development of longer-term relationships and trust.

In contrast, project teams can be extremely fluid. Within any particular project, different individuals with appropriate research, communications and project management expertise may represent a member organization at various points in time. As well, each project may involve different member organizations. Project teams may face resource constraints prohibiting the possibility of face-to-face meetings and tend to work almost completely through the use of electronic collaboration spaces.

The level of activity and enthusiasm in these collaboration spaces corresponds directly to the level of ambiguity and innovativeness of the project. According to David Weinberger, editor of the Journal of the Hyperlinked Organization, "clearly there are collaborative projects that aim solely at efficient execution of an established plan. Nothing wrong with those! In those project spaces, conversation is only required when something goes wrong. Project management software helps to manage these routinized

projects. But the more truly collaborative a project is, the louder and stronger and more animated will be the voices emerging from the project work place."[7]

Examples of project teams from IISD-hosted knowledge networks include:

SDCN Project Teams

- Rio+5 Website and Webcast (Earth Council and IISD)
- EcoLegis Environmental Law Databases (FARN and REC)
- Sustainable Livelihoods Module (ENDA, DA, IISD, SEI)
- Sustainable Cities Module (REC, ENDA, FARN, DA)
- Water Management Module (DA, ENDA, REC, SEI)
- Public Participation Module (FARN, REC, SEI)

CCKN Project Teams

- Climate Change Capacity Project – Africa (ENDA, IISD)
- Capacity Building for Latin American and Caribbean Negotiators (CSDA, IVM)
- "On Behalf of My Delegation...": A Survival Guide for Developing Country Climate Negotiators (CSDA, ENDA, IISD, IVM)
- Clean Development Mechanism Project (CSDA, WRI)

To date, the performance record of the virtual teams in these networks has been mixed. While a number of useful products have been created, the process has often been arduous, confusing and stressful. We have learned by doing - a process that has helped us to understand precisely how difficult and costly international collaboration can be. The problem is not a lack of technology; the problem is that the resources of civil society organisations are often stretched to the limit. The most experienced staff members are often overcommitted to a suite of projects within their organisation and external

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[7] Weinberger, David. "Groupthink: Collaboration as Conversation." *ePulse*. http://www.eroom.com/epulse/epulse_groupthink.asp (24 July 2001).

networks. Deadlines inevitably conflict and priorities are established and re-established on a daily basis.

In addition, civil society organizations may lack experience with working in collaborative international teams. Despite their commitment to participation and inclusiveness, sustainable development organizations have tended to be structured in hierarchical fashions that tend to impede the activities of knowledge network virtual teams. Nevertheless, we believe that international civil society organizations can begin to develop the processes and procedures necessary to the challenges confronting them.

2   Crossing Cultural Boundaries

Culture is a set of learned mores, values, attitudes, and meanings that are shared by members of a group. It is one of the primary ways in which one group differentiates itself from another.... Culture is often partially or wholly hidden. It can, however, affect people's assumptions, behaviours, and expectations about leadership practices, work habits, and team norms. There are three types of culture that can affect a virtual team: national, organizational, and functional. Each team member brings his or her culture, and, as the team evolves, the unique blend of team members' national functional, and organizational cultures create a unique team culture. [8]

2.1 National Cultures

The patterns associated with national culture often are established in childhood and are the most embedded. These, coupled with life experiences, create the differences in behaviour and thinking that exist when we talk about a person's cultural background.[9] In the context of knowledge networks, we also must consider language and seasonality as parts of national culture influencing virtual teams.

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[8] Duarte and Snyder, 54.

[9] Duarte and Snyder, 56.

2.1.1 General Issues

Duarte and Snyder outline six dimensions of national culture.[10] These six dimensions effect how virtual teams communicate and work together:

- Power distance - Extent to which the less powerful members expect and accept that power is distributed equally

- Uncertainty avoidance - Degree of structure required for a task

- Individualism-collectivism - Preference to act as individuals rather than as members of groups

- Masculinity-femininity - Extent to which a "masculine" orientation - concerned with things such as earnings, possessions and visible success - has priority over a more "feminine" orientation toward nurturing, cooperation and sharing.

- Long term-short term - Degree of focus on parsimony, family orientation, virtuous behaviour, and acquisition of skill and knowledge.

- High or low context - Amount of sensing and extra information needed to make decisions versus "just the facts"

While most staff in international sustainable development knowledge networks are aware that these differences exist, it can often be difficult to determine the best course through a decision-making process when multiple individuals are involved - each with a different combination of these differences.   A balance must be struck between respecting differences of opinion based on national culture and needing to come to a decision on a course of action. A balance must also be struck between understanding that national culture differences exist and allowing people the freedom to not follow stereotypes based on their national origin.

In addition to these general cross-cultural issues, IISD has encountered two additional issues confronting knowledge networks:

- How to work in multiple first, second, and third languages; and

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[10] Duarte and Snyder, 56-8.

- When to get the work done, taking into account regional holidays and seasons

2.1.2 Languages

International knowledge networks will usually involve individuals with several different native languages. Given the international nature of sustainable development, however, many staff working on knowledge network virtual teams may have experience living and working in countries and languages other than the one(s) in which they were born and raised. Staff are frequently multi-lingual with knowledge of both local and international languages (e.g. English, French and Spanish).   Nevertheless, English has become the common language of communications for knowledge networks within both management and project teams. Meeting minutes, project proposals, and network products tend to be produced in English.   Informal bi-lateral communications between network members or network members and the secretariat may occur in a broader variety of languages.

If some team members are less comfortable working in English, longer time schedules should be established for interaction to allow them to read through documents and to respond. Additionally, text based modes of communication and collaboration should be favoured over teleconferencing. It can be difficult for team members to understand English spoken with a wide variety of accents on the telephone or Internet video. And, they may be reluctant to speak if they cannot find the correct words to express their thoughts, especially if other team members are not well known to them. Text-based forms of collaboration permit people to reread both their own as well as other's comments. During face-to-face meetings, frequent coffee breaks should be scheduled to provide individuals time to check their understanding of issues with others who speak their native language.

2.1.3 Seasons and Holidays

In addition to the obvious difficulties in working across multiple time zones, knowledge networks must contend with the challenges of working across seasons and holidays in multiple cultures and both hemispheres. For example, many offices in Europe and North America are nearly empty during July and August as staff leave for summer vacations.

Likewise, institutions in Argentina may be short-staffed from December through January as summer holidays and Christmas combine. Fortunately, the December break also coincides with Christmas, Hanukkah and Ramadan celebrations in other parts of the world. Meanwhile, equatorial countries may concentrate vacations around April or September, the transitions between rainy and dry seasons when the weather is pleasant. In Latin America and the Philippines, the April holidays may also coincide with Easter celebrations. Scheduling of work becomes complex and becomes concentrated within very small windows of opportunity. Knowledge networks seem to concentrate their activities in March-June and again from October-December. The other six months tend to be used for individual project work.

2.2   Organizational cultures

Every group has both shared and competing values and assumptions that govern its collective behaviour. On the most basic level, there are two sets of polar opposites within which an organization can locate itself:

- Clan versus market - Clan culture views the organization as an extended family and its leaders as parent figures. Members are highly committed; teamwork if paramount. Market cultures are results-oriented with competitive members and aggressive leaders.
- Hierarchy versus adhocracy - Hierarchical cultures are formal, governed by procedures with a focus on structure and control. Adhocracy cultures are dynamic and adaptive, with a great deal of risk taking and innovation.

If a knowledge network team is to work together harmoniously, the individuals involved must begin to develop a process of working together across organizational cultures. This team's culture may be different from that of any particular member organisation, although it will likely be influenced strongly by the culture of the network manager or lead organisation. If there is a mismatch between the team's existing culture and the

demands of its task, the team may decide to develop new norms or to add new members who represent the culture it is trying to create.[11]

2.2.1 Planning and prototyping

Some of the most important elements of organizational culture are the norms for developing and implementing new projects. Virtually all new projects and ideas result from duelling approaches: "a wish list" of specifications and the prototypes that attempt to embody them. Often prototypes confirm that what we wish for is unrealistic or ill conceived. Conversely, they can also reveal that our wishes were not imaginative enough.[12] In complex and rapidly evolving fields, it is almost impossible for people to articulate clear specifications for what they want until after they have seen a prototype. Managing the dialogue between specs and prototypes is essential to design innovation. The balance between the two is a function of institutional cultures.

In the field of international sustainable development, this balance is played out as a tension over the size and scope of projects undertaken. Specifications are embodied in project proposals, while prototypes often take the form of pilot projects. Specification-oriented organizations will tend to favour projects with extensive preliminary research, and longer time frames for implementation. In order to recoup proposal development costs, the budgets will be larger. Prototype-oriented institutions will have internal processes that favour the development of numerous smaller proposals for pilot projects. These projects will be of shorter duration and provide ample opportunity for revision, expansion or abandonment of an idea. In establishing its knowledge networks and their initial suites of projects, IISD has favoured fast prototyping over extensive research and development of detailed proposals. Each project within a knowledge network builds upon the lessons, experience and momentum of the last. We have found that small

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[11] Schrage, Michael. *Serious Play: How the World's Best Companies Simulate to Innovate*.   Boston: Harvard Business School Press, 2000. p. 63.

[12] Schrage, 71.

projects have built the relationships and capacity necessary to undertake larger expansion projects as the relationships within the network matures.

For example, in 1999 the Sustainable Development Communications Network created a prototype of an online resource kit about non-profit Web management, the SD Webworks <http://sdgateway.net/webworks/> . Funding for the site was sourced as part of a broader network proposal to the Canadian International Development Agency (CIDA). The site contained overviews, recommendations, and case studies of good practice in planning, managing and evaluating sustainable development Web products and service. Based on the popularity of the Web site and its associated e-mail discussion group, the SDCN decided to expand the service in spring 2001. The network invited an additional eight organizations to attend a workshop in Vancouver to draft an expanded resource kit. In addition to attracting new members to the SDCN, these activities attracted additional funding and participation from CIDA and the World Bank Institute. In summer 2001, the SDCN began to develop proposals to share their expertise and to involve additional networks and organizations in improving civil society Web communication practices through a broader training and peer networking initiative.

Our findings based on the behaviour of non-profit research networks parallel those within the private sector. Recent research on innovation by Michael Schrage at the Massachusetts Institute of Technology (MIT) challenges traditional assumptions about teams.[13] Contrary to popular belief that innovative teams generate innovative prototypes, in fact innovative prototypes generate innovative teams. As Schrage has discovered, "an interesting prototype emits the social and intellectual equivalent of a magnetic field, attracting smart people with interesting ideas about how to make it better."[14] Good prototypes reveal underlying assumptions and create a demand for shared spaces (real or virtual) for conversation about them.

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[13] Schrage.

[14] Schrage, 28.

One implication of the prototype approach is that it is acceptable, even recommendable, to have strong lead organizations for both projects and the network as a whole. These organizations will propose ideas, structures, and processes for other members to consider and revise.

In theory, excellent sustainable development pilot projects should attract excellent staff and continued funding. Unfortunately, this is not always the case. Unlike in the private sector, success does not always attract continued support. Development fashions and trends may shift funding away from successful projects before the teams have matured sufficiently to be able to both implement and to seek additional resources and contacts. This is especially difficult for virtual teams since they may require more time to build trust and shared ways of working. However, if the network can agree upon guidelines for the network project development process during its initial setup phase (within the first 1-2 years), it will be better positioned to succeed in attracting future project funding.

Managing the collective project and proposal development process can be seen as the most critical activity of a knowledge network. The more network governance and membership are structured around the conscious creation of collaborative projects, the likelihood of innovation and success of the network should increase. However this is not a task for the faint of heart. It requires unprecedented levels of honesty and transparency at all levels between organizations.

To answer that question, network teams must address the following issues regarding project proposal development:
- Who is responsible for developing new product ideas?
- How will these ideas be presented to other members of the knowledge network?
- How does the individual with the idea begin to gather a project team?
- How will the initial project team prototype a proposal? Within what time frames?
- How will the project team determine that a proposal is at a stage to share with external audiences and funders for further revision?

- What funds should be budgeted for process support, both for the team leader and for other team members?
- Who will raise funds for the project?

2.2.2 Contract and Financial Management

Most literature on virtual teams assumes that teams are primarily comprised of individuals from within the same large corporation. No mention is made of the difficulties of financial management and budgeting within virtual teams across organizations. However, this can often be a major challenge for CSOs undertaking knowledge network projects.

Knowledge networks must grapple with the following issues:
- Balancing desires for parity in the distribution of funds with results-oriented management - Since organizations in various parts of the world face different cost structures and have varying staff availability to contribute to a project, it is highly unlikely that all will receive the same amount of funding for participation in a particular project.
- Scale - Funding must be of a level adequate to attract and maintain the commitment of each member organization to the project. While a project may be $100,000 overall, if there are four organizations participating, each will receive substantially less.
- Transaction costs - While there are internal incentives for an organization to serve as project lead clearing all project funds through the organization's books, the benefits to other participating institutions can be considerably less. At a certain point, the transaction costs for each organization to process financial transfers may outweigh the benefits to them of participation.   On occasion, SDCN network organizations have requested that staff work on small (CAD$2000) project contracts as individual consultants with funds flowing directly into the staff member's bank account.
- Multiple currencies - Shorter project cycles may help to minimize potential problems with fluctuating exchange rates. Nevertheless, project managers will have to cope with amalgamating financial reports from project participants in multiple currencies.

- Currency restrictions - A broader problem in dealing with international currencies is the existence of restrictions on funds being sent out from a country. Banking restrictions in some countries place prohibitive costs on the agencies there if they needed to send project funds to other sustainable development institutions around the world.

- Contracting cultures - Some sustainable development institutions follow standardized or generally accepted accounting procedures to account for the receipt of funds from donors as well as how funds have been expended and redistributed to other contracted project partners. Other institutions have more informal systems in place whereby fewer documents may be required.

Given the high opportunity costs for negotiating financial/contracting procedures for each project, the network should develop contract templates and financial procedures that can be modified to suit individual network projects. These templates and procedures will generally follow the accounting/contracting practices of the strictest member. Given that membership and institutional practices may change over time, the network should review contracting procedures periodically. In this way, knowledge networks can be seen as a force moving towards the professionalisation and standardisation of international civil society.

2.2.3 Implementing

When properly managed, collaborative projects are capable of creating and managing new kinds of relationships both within and outside a knowledge network. Through shaping a shared proposal development and implementation process, a knowledge network answers the question "What kind of interactions do we want to create?"[15] Project-focused interactions are at the heart of knowledge networks. How they are managed will determine the character, energy, creativity and success of the knowledge network.

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[15] Schrage, 20.

Process management involves resolving key issues including:

- How will the project team decide who serves as project team leader (both the organization and the individual) for the implementation phase?

- How will the project be evaluated?

- Who are the team members that will need to be involved? At what stages in the process?

- How will team members be welcomed into the group? How will it be clearly communicated that their work is complete?

- Who is responsible for each task/action that needs to be undertaken?

- How will timelines be established and agreed to?

- By what criteria will work be accepted as complete and of sufficient quality?

- What formats and forums will be used for discussion and feedback of prototype products?

- What will happen when a team member misses a deadline?

- How will copyright and proprietary information be handled?

- What acknowledgement and credits must be extended to team members, their organizations, the network, and funders?

- How will the project be concluded?

- How will the project team extract lessons from the process for feedback to the broader network?

These types of questions force individuals and institutions to confront the tyranny of trade-offs. That confrontation, in turn, forces people to play seriously with the difficult choices they must ultimately make.[16]

Most staff do not work solely on the activities of a particular knowledge network.   With the increasing complexity of projects and skills sets required for their effective implementation, CSOs tend to spread staff across many projects. The result is that most research staff are responsible for leading and participating in a variety of project teams

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[16] Schrage, 20.

within their organization at any given time. If the organization is a member of one or more knowledge networks, staff will also be managing their schedules to determine how best to meet complex schedules and deadlines.

As the number of projects and institutions dealt with by any individual increases, their ability to successfully complete all tasks can often be compromised.   Frequently knowledge network projects receive lower priority in a person's complex scheduling. This may occur for many reasons:

- Funding received by their institution for a network project may be lower than for single-institution projects.
- They feel that their supervisor does not see the effort put into the network project; thus, it may not be considered in personal evaluations and recommendations
- CSOs frequently operate in crisis mode - feelings of urgency are usually more intense when project staff are in the same physical location.

2.3 Functional Cultures

Knowledge networks must draw on the skills of staff from different functional areas of each member organization. Project managers, researchers, administrative assistants, communications specialists, information technology managers, and accountants may all be part of a virtual project team at any given time. However, each functional group may share common ways of working, shared vocabularies, and assumptions about project management. Disagreements may occur in virtual teams when people from different functions disagree about how appropriate a particular approach is.

In sustainable development knowledge networks, one example of a functional culture clash is that which may occur between researchers and communications specialists. Communications staff frequently complain that they are considered second-class staff within their institutions and that their skill sets are undervalued. On the other side, researchers frequently complain that communication staff take too long to complete their tasks and create a bottleneck in the production and release of timely research.   In addition to differences in education and professional socialization, these conflicts may

also be exacerbated by gender and age differences between research and communications staff.   Training sessions on the organization's communications practices and/or developing communications steering committees may reduce conflicts to some degree.

3   Crossing Technical Boundaries

Knowledge networks have a wide variety of real and virtual spaces within which to collaborate on the development of projects. All may be necessary at some point in the development of collaborative projects.

Before exploring technical options open to knowledge networks, it is important to note that face to face meetings are by far the best forum for interaction and collaborative work. They are context-rich and allow for the most direct resolution of conflicts and miscommunications. Unfortunately, knowledge networks rarely have the travel funds to do all the work in person. In addition, many sustainable development organizations are trying to reduce travel in efforts to "walk the talk" of sustainability. Some degree of electronic communication will therefore have to be used at various points in the conceptualization and implementation of a project.

The challenge is to match an available technology with the team's task at any given point in time. Two primary factors can help virtual teams to assess the effectiveness of one technology over another in different situations:[17]

- Social presence - Social presence is the degree to which the technology facilitates a personal connection with others. Synchronous (same-time) communications have higher social presence than asynchronous (different time) communications because they enable a spontaneous, back-and-forth exchange. Situations that are ambiguous or ill defined or that require the expression of emotions call for a technology with high social presence. Routine situations, such as regular exchanges of information, may benefit from technologies with less social presence.

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[17] Duarte and Snyder, 26.

- Information richness - Information richness has to do with the amount and variety of information flowing through a particular communication media. High information richness helps to accurately transfer clues to the meaning of the communication, thereby reducing confusion and misunderstanding.

Other factors which should be considered include: the ability to generate a permanent record of the communication, time constraints, access to technological training and support, organizational and functional cultures, and experience and familiarity with virtual operations.

The following section reviews some of the learnings from IISD's knowledge networks on organizing and facilitating these collaborative spaces for both network management and project teams. For additional information on matching tools to situations, *Mastering Virtual Teams*[18] will serve as an invaluable resource. In addition, *Working Together Online*[19] provides in-depth advice on how to facilitate virtual communities and work groups.

3.1   Telephone

The telephone is perhaps the most familiar collaborative technology for virtual teams. It is also one of the most effective tools, especially for maintaining contact between members of network management virtual teams. Phone calls provide high levels of social presence and information richness that maintain stronger relationships at the core of the network. Phone calls are also the best tool for resolving conflicts or for sharing sensitive information. People are willing to say many more things than they would write down about the organization operates and what internal challenges a project may be facing.

Conference calls are useful throughout the implementation of projects and activities. At the beginning of a project, a conference call enables team members to establish a sense of

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[18] Duarte and Snyder.

[19] Rykert, Liz and Maureen James. *Working Together Online.* Web Networks: Toronto, 1997.

themselves as a team. Hearing each other's voices adds an additional dimension to the relationship and lends a small force to ensuring a sense of mutual responsibility and obligation to people. Should scheduling conflicts arise during project implementation, a conference call can provide the venue for the team to regroup and re-establish priorities. At the end of a project, conference calls can enable the quick brainstorming of lessons learned. Learning is a group activity and is most easily undertaken when the insights of one member can spark additional thoughts from the others. Group debriefing is especially important for knowledge networks since members of a project team can anticipate working with each other in the future in other project teams. Problems and conflicts must be dealt with in a respectful and appreciative manner in order to ensure that mistakes will not be repeated in the future and organizations feel comfortable continuing to work together. Conference calls help to minimize misunderstandings during these group-learning sessions.

Tips:

- Conference calls with many international partners may require up to two weeks to organize. This provides ample time to ensure the availability of team members and to double check their phone numbers. Sustainable development staff travel frequently and may not be at their home office during the time of a call. Nevertheless, if scheduled in advance, team members may be able to join the call from a hotel phone anywhere in the world.
- Conference calls for a virtual team should be held at a regular time and consistently communicated in reference to a selected time zone. The SDCN found that 1-hour long calls starting at 13:00 GMT were the most effective for its network management team with members spread from Costa Rica to India.   Invitations should include reference to standard time zone converters[20] in order to assist members to calculate their local time. Even with a consistent reference time, local call times may vary due to daylight savings time.

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[20] http://www.worldtimezone.com/time24.htm and http://www.worldtimeserver.com/ are among the services available online.

- Shop around for conference call rates. One of the most useful aspects of a knowledge network is its distributed geography. Given lower teleconferencing rates in Canada than in developing regions, IISD has convened a number of project team conference calls for other SDCN members, even when IISD was not directly involved in the project. This has proven cost-effective.

- It is advisable to use a commercial teleconferencing service for conference calls involving more than three people. While it may be more expensive than in-house options, it frees the team leader and participants to focus on the objectives of the call while the operator handles technical difficulties. Most commercial services will provide a toll-free number to each call participant to contact if they are accidentally disconnected from the call.

- The final versions of the agenda and supporting documents for a conference call should ideally be circulated at least two days prior to the call to enable members to print them out and review them. Depending on time limits and number of call participants, the agenda should be restricted to one or two major issues with decisions.

- Each call will require 1 or 2 people to act as moderators. One person should be focused on facilitating the conversation to ensure that issues are covered and that all team members have had an opportunity to participate. This person should check regularly for feedback from quieter members of the team. The second person should serve as note-taker to ensure that suggestions are captured and wording of any decision is clear. Depending on the size of the group and the nature of the issue under discussion, it may be difficult for one person to play both roles.

- Conference call minutes should be typed up and circulated to call participants by email to check their accuracy before being shared with others.

3.2 Email

Email is the most often used communication tool for knowledge network virtual teams. Its asynchronous nature allows members to communicate with each other when and where it is most convenient for them. Email messages can either be sent directly from

one team member to another or through a discussion group from one person to all team members. A combination of each is usually necessary throughout a project.

Team-based email discussion groups are invaluable tools for discussion and document circulation. There are many platforms available that organizations may either purchase (e.g. Lyris) or customize and use (e.g. egroups.com). The decision between these options should be based on the availability of technical staff within the network as well as the level of comfort a group has with using a commercial service. Increasingly, knowledge networks are finding the free Web applications[21] can provide the same or better level of quality service as ones you must purchase and configure in house.

Tips:
- Find out if any team members use alternate email addresses when on the road.   Staff within organizations with much technical support may maintain multiple e-mail accounts, using a hotmail or other free Web-based email account while on the road.
- In addition to a general closed discussion group for all relevant staff within the knowledge network's member organizations, establish one closed discussion group per virtual team. The general list should be used for general discussions and information sharing. The team lists are for more specific conversations regarding each project.
- Adhere to standard netiquette and do not forward messages from one list to another without the explicit approval of the message's original author. At the same time, assume that anything you write may "accidentally" be forwarded to others. Do not write anything in an email that you would not wish everyone in the network to read.

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[21] Free services are usually supported by advertising. If your virtual team does not wish to be subjected to advertising in each email and on the Web interface, you may pay roughly US$50 per year to have the advertising removed.

3.3   Online Chat

Given time zone differences and unequal technological support, online chat meetings can be difficult. To this point, we have not considered it to be an appropriate technology for any of IISD's knowledge network virtual teams. However, we did use it with one virtual team of young people working on a prep conference leading up to Global Knowledge 2000. The steering committee of seven young people from Malaysia, India, Kenya, Costa Rica, Colombia and Canada used a free online chat service to hold a two-hour meeting finalizing plans for an e-conference.

Tips:

- Like a conference call, special attention must be given to establishing a clear agenda and to ensuring that team members know the local time of the meeting.
- Chat meetings require roughly twice as long as conference call meetings to cover the same agenda. People type much more slowly than they speak. Agendas must be correspondingly shorter.
- The moderator of a chat meeting should prepare statements introducing each agenda item in advance of the meeting. These can be quickly cut and pasted into the chat dialogue window at appropriate times. There is nothing more frustrating than waiting for someone to type a long thought or idea.
- Delays between participants beginning to type and finishing can lead to staggered, incomprehensible threading of the chat. To avoid this, the moderator should ask who has a comment to make and then call on people in order to type/submit their comments. This helps to ensure that comments are not repeated and the discussion builds upon earlier comments.

3.4   Online video/audio conferencing

Online video/audio conferencing has been touted for many years as a cost-saving forum for virtual team meetings. While NetMeeting is increasingly available to organizations as they upgrade to new versions of Microsoft Office software, it has proven to be of limited utility for sustainable development virtual teams scattered around the world. More time is often spent on technical adjustments than on the subject of the meeting.

The most useful application of audio/video conferencing so far has been in conjunction with face-to-face meetings. The representative from the Earth Council to the SDCN was unable to attend a network meeting in Canada in December 1997 in person; he joined instead through NetMeeting from his office in Costa Rica. Six months later, the representative from the Stockholm Environment Institute used NetMeeting to participate in a network meeting held in Costa Rica. In May 1999, we attempted to have a representative from the Canadian International Development Agency participate through NetMeeting in a workshop held in Dakar, Senegal. Heavy network traffic and poor quality connections negated the effectiveness of that experiment.

From these experiments, we found that it was necessary to have one support staff at the physical meeting location assigned to monitoring the NetMeeting connection. This person needed to continuously ensure that the audio feed in each direction was clear. Video was of poor quality and disabled as soon as a clear image of the person could be captured and stored. The technician would also maintain contact with the remote participant through the chat feature of NetMeeting. If the remote participant wished to make a comment or intervention in the meeting, the technician would indicate this to the rest of the room.

3.5   Extranets

Extranets are controlled access Web spaces for members of a knowledge network or one of its project teams. The main function of Extranets has been storage of common project information - databases of members and their contact information and space to upload files. From our experience, few team members either upload or download information from team extranets.   Nevertheless, they may serve as an important historical reference for the network, supporting the orientation of new staff at member organizations.

3.6   Collaborative Internet Software

There are a growing number of companies providing specialized software for virtual team collaboration. These collaboration platforms integrate many of the online features outlined above with tools for sending group emails, chat, uploading documents, and

managing group calendars and tasks. More advanced platforms allow the creation of shared whiteboards, document version control, shared Web navigating, and sharing of desktop control. Some of this software is Web based (e.g. Egroups, CommunityZero, WebEx); other applications require the download and installation of specialized software (e.g. Groove, NetMeeting). Some companies (Eroom) provide both options depending on the desired level of use and functionality. Most companies provide a basic level of service for free and charge for additional storage space or features. Of these services, Egroups, CommunityZero and Groove appear to provide the best range of options for non-profit sustainable development teams.

Nevertheless, we have not found these applications to be useful for knowledge networks. While they are well-designed tools, there is little demand by team leaders or team members for the services the advanced features they provide.   This reflects more on the informality of civil society project management styles than it does on the software itself.

4   Conclusion

In the spirit of innovation and prototyping, IISD has established several knowledge networks over the past three years. These networks have, in turn, spawned collaborative projects created and implemented by virtual teams. We have found that leadership of the management and project teams is one of the most critical indicators of long-term network success. This leadership demonstrates itself through the establishment of consistent procedures for teams that allow them to contribute their skills and knowledge. These procedures will reflect the nature of network activities as well as the national, organizational, and functional cultures of the organizations involved.