EVALUATION OF PARTICIPATION IN AN ONLINE COMMUNITY OF PRACTICE

by

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Communities of practice have recently emerged as a method of fostering innovation across a wide array of pursuits. This paper presents one online, international, multi-organizational community as a case study and identifies several possible obstacles which could inhibit involvement by the group's members. A survey of the community indicated that available time, access to and communication about the community, value, computer comfort and other factors influence participation. In order to increase involvement and the vivacity of the community, these barriers should be minimized where possible. Some possible solutions to mitigate non-participation are explored.
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1. Introduction

The Internet has made it possible for communities to exchange information easily across international and organizational boundaries. This ease of exchange, however, does not guarantee utilization, as there are many motivational factors for and possible barriers to participation in a community. This paper will briefly review communities of practice, and examine one international community of practice as a case study.

This case study is somewhat of a departure from the currently available literature in that the community presented is both multi-organizational and multinational. Studies on communities of practice have predominantly looked at groups based in the United States; this group is primarily comprised of citizens of developing nations in Western Africa.

Because of the different countries and organizations involved, a collaborative website, described in this study, was developed to facilitate community information exchange. However, actual use of the website has been much lower than expected. To evaluate member reasons for participation and non-participation on the site, the community was surveyed.

This paper presents the results of the community questionnaire. Finally, suggestions and guidelines from the literature on the successful development and sustenance of communities of practice will be reviewed.
2. Communities of Practice

A community of practice is "a group of people who have a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis." (Wenger, McDermott and Snyder, 2002, p. 4) These groups can be formal or informal, at work, at home, or in a social setting. During a shift change, the staff of a computer help desk may swap questions and tips about a recurring problem that they encounter. A group of people who drive the same type of car might query an online discussion forum about getting their engine to turn over on a cold winter morning. Employees of different local governments may have an annual conference at which they share their success stories and failures, and pick each other's brains about new approaches and tactics. The members of these groups are trying to build up their individual and collective knowledge about a particular topic, about a fix to a specific situation, and about approaches to general scenarios. Together they evolve a body of knowledge and innovative problem solving methods, which are constantly tested, evaluated, refined, and retooled. They also develop personal relationships and bonds, and develop a sense of community identity.

While the notion of learning from natural interaction with others has been around as long as humans have been, the term "communities of practice" was introduced by Jean Lave and Etienne Wenger as the result of investigations into social theories of learning. Wenger (1998) noted that many institutions view learning as an individual act, and thus design instruction, training, and tutorials accordingly. He suggested placing organizational learning more in the context of experiences and participation, and that learning frequently happens through social interaction. Communities of practice are different from a project team or other standard organizational group,
"because they are organic, driven by the value they provide to members, organized around changing topics and bound by people's sense of connection." (McDermott, 2000, p. 3)

Many of the seminal works on community learning and improvisation for organizations have come out of Xerox PARC. In considering design for human-computer interaction, Suchman (1987) explored the difference between plans and actions taken on an interpretation of a given situation. She suggested that research "explore the relation of knowledge and action to the particular circumstances" in which they occur, rather than producing formal models of knowledge and action. (p. 179)

Orr (1990) investigated 'community memory' in a series of ethnographic studies on the interactions of photocopier service technicians. He learned that the official training and documentation on how to repair these machines frequently failed the technicians in their day to day encounters. To close this gap in official organizational knowledge, they informally swapped war stories on how to fix particular problems or deal with customers. In doing so, they developed the 'community memory,' a body of tacit knowledge, circulated throughout the community through repetition. In addition to developing detailed knowledge on problem solutions, this process also developed a community identity for the technicians.

Brown and Duguid also examined the disparity between plan and practice. They noted that, in the workplace, jobs and tasks are codified and trained for in one way, but usually innovated upon and performed in an entirely different way. They came to view "learning as the bridge between working and innovating." (Brown & Duguid, 1991, p. 41) They suggested that an organization wanting to improve working,
learning and innovating should employ communities of practice, and ultimately "re-conceive of itself as a community-of-communities." (p. 53)

While these accounts make for interesting reading, it is not the intent of this paper to investigate how we innovate and learn, but rather why one would choose to do so within a community of practice. In determining factors that encourage and inhibit participation in such groups, it is hoped that those factors can be leveraged to increase participation and thus amplify the benefits for the community and its members.

Millen, Fontain and Muller (2002) looked at the costs and benefits of developing and supporting a community of practice from an organizational standpoint. They studied nine communities in seven firms and discovered that there are individual, community and organizational benefits to participating in a community of practice. At the individual level, employees reported:

- "improved reputation [within the organization],
- a better understanding of what others are doing in the organization,
- increased levels of trust," and
- "increased access to subject-matter experts and valuable information resources." (pp. 70-71)

The benefits to the community included:

- "increased idea creation,
- increased quality of knowledge and advice,
- problem solving, and
• the [creation of] a common context." (Millen, et al., 2002, p. 71)

The organizational benefits were possibly the most tangible. They found that the communities of practice "contributed to successfully executed projects, increased new business, and product innovation." (Millen, et al., 2002, pp. 71-72) Perhaps most importantly, the existence of the community saved time. One interviewee remarked that "50% of the time... you will find someone else who has had the problem and who has solved it. Basically, that can save a lot of work." (p. 72)

Some of these sentiments about benefit echo an earlier study by McClure Wasko and Faraj (2000), who investigated why members participate and share information in electronic communities of practice. They surveyed members of three technical Usenet newsgroups, and found that, in part, the motivation to exchange knowledge is affected by "moral obligation and community interest." (p. 155). Some of the gains they defined as "tangible" reinforce the individual benefits discussed in the Millen study: members acquire valuable information, answers to specific questions and some personal gain. Respondents also indicated that they gained intangible benefits, such as enjoyment, learning and the refinement of their own thinking.

This study also gives some insight into why people choose to participate when they are the ones sharing the knowledge, rather than the ones gleaning it. Many respondents indicated that they share their hard won information because of reciprocity, to pay others, or the community, back for information that had obtained in the past. If they "draw from the public good, then it is only fair to help others" in return. (McClure Wasko & Faraj, 2000, p. 168) Other respondents noted that sharing made them "feel confident" and gave them "the chance to show-off." (p. 166) As one participant declared, "I get a kick out of feeling competent." (p. 166)
For all the benefits that come with participating in a community of practice and sharing knowledge, there are also downsides. From their research, McClure Wasko and Faraj (2000) also identified many potential barriers to community participation. Many of the Usenet newsgroup members are 'lurkers', members who read postings but do not contribute any comments themselves. Many of these members suggested that they do not contribute because they are not of a sufficient skill level to be helpful to others.

Other members who did possess sharable skills and knowledge still opted not to contribute or even to participate, because participation was too time-consuming. They indicated that, with the amount of messages available, it was too difficult to root out good quality information, and that the value of the community was being "diluted" by novice and uninformed questions.

Finally, people choose not to participate in communities because of the other members of that community. Disillusioned Usenet participants cited large egos, one-upmanship, and attacks by certain members on the ideas of others as formidable barriers to continued participation.

Clearly, participants in a community of practice can reap many benefits, but they also face many obstacles to their participation. The challenge for organizations that want to develop such a community is to accentuate the positive and eliminate the negative, as much as that is possible. This balance is important in not only creating a community, but also in sustaining it as it grows.
To examine some of the dynamics or membership and participation in communities of practice, a case study of one international, cross-organizational online group is presented. Some general background on the focus and creation of the community is discussed, then a more in-depth, technical look at the web tool members use to participate is described. From the experience of developing the community and from suggestions in the literature, many potential factors that influence participation were identified.

To determine whether the factors identified truly shape participation in this case study group, a survey developed to appraise the factors was sent to the community members. This paper shares the results of that study, along with some prospective solutions to successful community development.

3. A Case Study Community of Practice

A case study for a community of practice can be found in the Dialogue on Democratic Decentralization, referred to here by its sobriquet, 'DDialogue'. Its members are dedicated to working on issues related to local governance and decentralization policies for regions in Africa. According to the community website, DDialogue is "a network of people committed to:

- Increasing the exchange of useful decentralization information and perspectives between local and central level peers, within and across sectors, within participating countries, and across regions of Africa
- Strengthening local government effectiveness, particularly in the area of public finance, local revenue generation, and public-private partnerships.
Increasing local engagement in decentralization policy development."

(DDialogue)

The members of the DDialogue are very geographically distributed, over at least 27 countries and on different continents, and they do not work for the same organization or government. This means that arranging face-to-face meetings is challenging and expensive, and that the members do not have a common organizational infrastructure, such as a computer network, over which to exchange information on a regular basis. Consequently, the core of communication between members takes place over the Internet.

The DDialogue was first formed in 1997 by a non-profit research organization based in the United States in conjunction with the Leland Initiative of the United States Agency for International Development [USAID]). Key stakeholders from central and local government and civil society organizations in each of four West African French speaking (Francophone) nations, Benin, Cote d'Ivoire, Guinea and Mali, were brought together to discuss decentralization issues. At this and subsequent regional meetings, the teams discussed "ways of building public awareness and support for decentralization policy; municipal associations' role in maintaining a national dialogue about decentralization reform; local resource mobilization; electoral procedures to promote local accountability; and human resource development strategies." (DDialogue, 2001d, para. 6) Country teams also developed national strategies for decentralization and identified steering committee members for the group. (DDialogue, 2001d)

The community decided to build a website to serve as their virtual meeting place, perhaps to ease the difficulties of arranging international in-person meetings, and to
increase the chances of keeping the community active in the long periods between meetings.

On the first incarnation of the community website, the Leland Regional site, members submitted their contributions to a site administrator, not directly to the site. Most contributions, such as documents and case studies, needed to be marked up into HTML so that they could be viewed on the website. News articles were already in a web-readable format, but the administrator still had to approve them before they would appear on the website. Thus, none of material submitted was immediately available, as some action was required of the administrator before contributions appeared on the site.

In 1999, the community decided to expand to other countries in West Africa, including English speaking (Anglophone) ones working on the same issues. It was also decided that the capabilities and depth of the website should also be expanded, and so the opportunity presented itself to rebuild the virtual meeting place from scratch.

A new trajectory for the community website was shaped, based on a strong professional philosophy of one of the project managers. From long experience in building communities, she had learned that in order for a community to grow and be successful, three components are necessary: access to the community, communication and valuable content. She referred to as the “three-legged stool” philosophy (although it has been pointed out that the traditional stool in Ghana only has two legs). The chair, and thus the community, could not remain standing without any of its three supports. (Gadell, 2001)
Without access to the community, its members cannot participate. Therefore, the website had to be accessible, easy to navigate even for novices, and appealing.

Without communication about the community, potential new members could not find out about it and join, and natural growth would be difficult. Therefore, a new communication strategy was adopted, wherein the community could be introduced at conferences and in the press, and with some promotion strategy. Also, the site itself would automatically notify members of new content and updates, so the members would return to and continue to use the site.

Without valuable content, participants would have nothing to gain from membership. They might also be less inclined to contribute their own content, and then the community could become stagnant. Because of the importance of this final leg, the website was redesigned as a content management system.

A content management system (CMS) is simply software or code that allows users to manipulate material, in this case on a website. In terms of publishing, a CMS separates the content from its appearance or layout. (Hunter, 2001, para. 7) Customized text can be delivered, "on the fly, and without human intervention." (Hunter, 2001, para. 7)

Using a CMS on the DDialogue allows community participants to become the champions of the community content. The website expanded into a stronger tool, which empowers members to publish their stories and documents directly and immediately on the Internet, without the need for mark up, modification, or approval by any other party. Notably, participants do not need any special skills, outside of
using a web page, to be able to share their information and to see their work published.

Although DDialogue organizers expended a great deal of effort on the human facet of the community development, that aspect will not be further expounded here. Some documentation of those efforts appears on the website. An in-depth description of the DDialogue website from a technical perspective appears in the following section.

4. Site Description

4.1 Introduction

The DDialogue website is dynamic: its community manages its content on an ongoing basis. As the participants do not have access to the web server file system, and as they may or may not possess web skills, they add, edit and delete content directly on the site by interacting with web forms. These online forms are the user's interface into a back-end database, where all the content for the site is actually stored. The site was developed using Macromedia's Cold Fusion for the web pages and interfaces and a Microsoft SQL Server database for the back-end.

For each site section, a template of content item elements is predefined. The online forms guide the user in entering each of these pieces of information directly into the database. The web pages that display the site content retrieve the items from the database and render them on screen in a predefined format.
Therefore, the content sections of the site are database driven, based on user contribution. The community website not only displays the content, it also serves as the content management system.

The structure of the website is made up of fixed elements, which cannot be altered by the users. Each page displays a standard top banner, a left-hand navigation menu and bottom footer, so each page is consistent in its appearance. Although the header and menu are graphic and colorful, page weights for the site were designed so that they did not exceed 52 Kilobytes, to ease download time for slow connections. A screen shot of the site home page can be found in Appendix A.

**Standard Top Banner:**

![Dialogue: on Democratic Decentralization](image)

Other fixed elements include the web forms that guide the user through content management, the web code that displays items retrieved from the database, and section introductory text. User feedback messages are also set text, such as a confirmation message of a successful upload.

A security framework encompasses all aspects of the website, to control content management privileges for the three user groups: guests, registered participants and administrators. A guest of the website is any visitor who does not log in. Any guest can browse through all available content, with the exception of some participant related information. Guests cannot contribute any new items to or edit items on the site.
In order to take advantage of their contribution privileges, participants and administrators must log into the site by providing a valid username and password combination. Usernames and passwords are chosen by the participants at time of registration. Once logged in, a registered participant can contribute content items, and can edit or delete any item that they originally contributed. They cannot edit or delete content items that were contributed by other participants.

Administrators for the site are registered participants with special content management privileges. These users are employees of the developing and hosting organizations for the site. In addition to the ability to contribute new content, administrators can edit or delete any item on the site, regardless of who originally posted it. This affords administrators the capability to reset a participant password, remove any offensive material posted, or make minor spelling corrections, should these actions be requested or needed. It should be noted that these privileges are invoked only in special circumstances, and that the site is not moderated.

Site administrators also manage the content of the 'static' sections of the site via web-based forms. This includes the background information for visitors: a project overview, project management contact information, site partners and steering committee information if applicable. Administrators also have the capability to add instructive 'help' text to any module of the site via a web form. Finally, site
administrators manage the options on the drop down lists provided for item indexing, such as a topic list or a country list.

### 4.2 Content Contribution Modules

In terms of contributed content, the community website is comprised of eight major modules in which registered users can add items: participants, news, events, experiences and practices, related site links, a document library, a discussion forum and hot topics. Cutting across all of these content modules is a subscription option, with which registered participants can request to receive notifications of new items posted to the site.

#### 4.2.1 Participants

The participants section of the site includes all registration processes and member listings. This is where the electronic aspect of the community begins: where members come to sign up to participate in the group. This module stores the personal information and security credentials for each participant.

Like all other content contribution modules, the participants module, has two aspects: an interactive aspect in which users manage the content and a display aspect, in which visitors to the site retrieve the available content.

New users who want to join the community use the registration form on the website to become a member. They are required to enter their name, an e-mail address, a username and a password. First name and family name are required pieces of information, while middle name is optional. The username must be unique, meaning
that it is not already in use by any other registered participant on the website. The password is not displayed on the screen; it is masked by use of a password type HTML input box. Strong passwords are not required.

Additionally, space is provided for the user to fill in the name of their organization, their title, physical address, country, phone and fax numbers and a web address (URL) for their organizational or personal website. These fields are optional and if not provided will not halt the registration procedure. Users can select their country from a drop down list, but if their country of residence is not listed, they can enter it in straight text.

A checkbox at the bottom of the registration screen indicates whether the user would like to subscribe to receive notifications of new item posting to the site. The default state is for this box to be unchecked, so participants do not receive e-mail unless they request it.

Once participants are registered, they can log on with the username and password they selected and make content contributions to the website. They can also edit their member profile at any time, meaning they can modify the information they provided at registration time, including changing their password.

Member registration is not moderated. Once a user submits a registration form, he is a registered member of the community.

The display aspect of the participants module lists the names of all registered members. The main page lists a shortened version of the member profile, showing only name, country and organization of each participant. A guest to the site has four
methods of drilling down to a particular member profile: a full participant list, an index of the participants by the first letter of the last name, an index of the participants by country of residence and a search tool. To view full participant information, the user clicks on the participant name from the list of users.

The participants module is the exception to the information sharing principles of the website. In all other modules, all information is available for browsing by the general public, or guest users. Most participant information, including the participant's address and phone number, is visible only to other registered participants to the site who are logged in.

4.2.2 News

In the news section of the site, participants can post news articles about pertinent topics, such as the announcement of a new civil service communication program, background for an upcoming election, or the text of a speech of a national minister. They can also share a short version of one of their own experiences. This was expected to be the most popular section of the site, as users could quickly dash out a quick story and easily post it.

To add a new news item, a user clicks on the 'Add News' button from the main page of the section. This button only appears if the user is a logged in registered participant. This design element is also true for all other modules.

The add screen prompts the user to select a country name, or the generic label 'regional' from a drop down list. The user enters text for the title, specific location within the country and the full text of the news story. The author and date of the
article are seeded as the name of the logged-in user the current date, respectively. The date of contribution is automatically recorded. The user also has the option of uploading an attachment document to the news article. If an attachment is provided, the document is automatically sent to the document library module, and a link to the document file appears in the display of the news article. Thus the document is available from multiple access points on the site.

**Add News Screen:**

**Add a news article**

- **Date:** 11-Nov-2002
- **Country:**
- **Location:**
- **Author:** Robbins, Ms. Elizabeth E.
- **Title:**
- **Article:**

If you would like to attach a related document to this news article, please click on the Browse button below and locate the document. The file will be linked to the news article and will also appear in the library.

- **Topic:**
- **Pages:**
- **File:**

On the main page of the news section, all current news article titles are listed, along with the date they were posted, and the country to which they pertain. A current article is defined by site policy as one that was posted within the last thirty days. Articles are listed in chronological order with the most recent article shown first. The main page also has a link to the news archives, where all articles older than thirty days are displayed in an equivalent list.
From either the current or the archive list, the user can click on the title of any article to view the article detail, which lists the title, contributor name, contribution date, country, specific location (if provided), and the full text of the article. If the contributor also attached a document, a link to the attachment, stored in the library, is also provided. If the user is a logged in participant who contributed the article or an administrator, a button to update or delete the article is displayed.

A teaser for the news section is also displayed on the home page of the entire site. The five most recent article headlines, regardless of current or archive status, are displayed on the home page, with links from the title to the article detail, and a 'more news' link to the main page of the news section.

### 4.2.3 Events

The events module was created to give participants a space in which to post upcoming calendar events. Examples of events that might be posted in this section include an upcoming conference or workshop that others might be interested in attending.

This input screen prompts for text entries for the title, description, location, contact information, and dates for the event. The identity of the contributor and the date posted are automatically recorded. If an e-mail address is entered into the contact information field, it is converted to an HTML 'mailto:' tag, so when browsing users see it in the events display, it appears as a hyperlink on which they can click to send mail directly to the contact person's e-mail address.
The events are displayed in text form rather than in a graphic grid style calendar. Items are listed chronologically with the nearest event in the future appearing first. Once the start date for an event has past, it is no longer displayed on the calendar. If there are more than ten events to be displayed, pagination controls are provided for the browsing user to move forward and backward between event screens, where ten events would be listed on each page.

4.2.4 Experiences and Practices

In the experiences section, participants can share more developed stories of their real-life practices concerning local governance issues. Some examples of experiences contributed include the development of financial regulations and a project, which created a structured training program for agents of decentralization. This section was originally named 'case studies,' but user feedback to the project manager indicated that this label was somewhat intimidating. Users felt that they needed to develop a very formal and thorough study write-up before they could post anything in this section. In order to demystify this section and encourage people to use it, the module was given the less formal label of 'experiences and practices' just after the release of the Anglophone version of the site.

When adding new experiences, users select a topic and a country name from drop down lists. 'General' and 'regional' are provided as more generic indexing groups for these categories. The user then enters text for the title, author, and specific location within the country or region. Instead of a single field for the body for the text, as in the news section, the user is prompted with four large text input areas: synopsis, context, experience, and results. These fields store the experience summary, the background, the practice that was put into place, and the lessons learned from the
experience, respectively. The participant who made the contribution and the date posted are automatically recorded.

Because this section is intended to store more in-depth stories that might spur some offline discussions, the contributor can also enter the name, address, phone, fax and e-mail of the primary author. The author is not automatically recorded as the participant currently logged in, because it is likely that the experience came out of the work a group of people, for example a non-governmental organization (NGO) who observed a local election in rural Benin. The contributor can also enter names of additional authors, with their contact information.

The contact information is supplied to foster communication outside the bounds of the website. For example, a site visitor who is investigating how to increase citizen participation in local government in Uganda might find an experience entry for someone working on the same issue in Ghana. The visitor could then phone or send e-mail to the authors of the experience to find out more detail about the pitfalls and strengths of the approach they used.

As in the news section, contributors can also attach a document to an experience. This allows any community members who have already written up a case study for their own organization to just add that document without having to rewrite the experience in the structural format required by the website.

Experiences and practices are displayed on the site in clusters, as filtered by the indexing categories of topic and country chosen by the contributor at time of upload. On the main case study page, the listing defaults to the first index type, topic, and defaults to the first topic group available. When in the topic 'view' all available topics
are listed, with the number of case studies available for each one. The current topic is marked by an open folder icon (all other topics are marked by closed folder icons) and a text label on the page. The user has the option of switching to another index 'view', country, in which an equivalent list of countries would appear.

Index Cluster Example from the Document Library

<table>
<thead>
<tr>
<th>Library</th>
</tr>
</thead>
<tbody>
<tr>
<td>Index: Topic</td>
</tr>
<tr>
<td>Topic</td>
</tr>
<tr>
<td>Citizen participation (8)</td>
</tr>
<tr>
<td>Dialogue Activities (10)</td>
</tr>
<tr>
<td>Human resources (0)</td>
</tr>
<tr>
<td>Legal and institutional framework (2)</td>
</tr>
</tbody>
</table>

To add a document, you must be a registered participant. If you are already registered, please log in. If you would like to become a participant, please register.

Topic: Local finance and management techniques

Documents available in PDF format require Adobe Acrobat Reader, which can be downloaded free of charge from [http://www.adobe.com/products/acrobat/readstep.html](http://www.adobe.com/products/acrobat/readstep.html).

- Credit Control: Practical & Effective Ways to Improve Revenue Collection
  Muller, Louise Anne
  6 pages (23-Jul-2001)
  Abstract | Document
  Microsoft Word | 46 KB 15 sec. @ 28.8 Kbps

In either indexing situation, all existing experiences for that category group are listed down the page, with the most recently contributed item displayed first. This listing shows the title and the synopsis text of the case study, with a link to the full detail of the experience. The detail view displays all fields of data uploaded by the contributor.

4.2.5 Related sites

The related sites module is a resource listing of other web sites which might be useful for or interesting to community members. For example, a community
participant may choose to add a link to an African news agency website, to the World Bank site, or to an official government site.

When participants add a link to the site, they are prompted to fill in the web address (URL) for the site, a text title for the site and, optionally, a brief description to give visitors a better idea of what might be found on this external site. The contributor also indexes the related site by topic and by country, both selected from drop down lists. As with the other modules, generic entries are provided for each index category, and the contributor identity and date of posted are automatically recorded.

Visitors to the community site can retrieve or view the related link clustered by index category. No 'detail' view for each link is necessary since all available metadata is shown on the listing. Clicking on the title of the related site link will take the user to that related site.

**4.2.6 Document Library**

The document library is a resource listing, which contains documents contributed by community members. The library can contain many different kinds of documents, such as financial procedures, examples of proposals and budgets, monitoring plans, a case for more gender equality in government interactions, local governance handbooks, or even copies of national laws for holding an election. The library also contains any attachments to a contributed news story or case study. Documents are only available in the format and version in which they were uploaded, so if one community member submitted a file in Microsoft Word, but another community member does not have Word, he will not be able to read it.
When uploading a document, participants are prompted to enter the document title, author, date of document, number of pages in the document, and a descriptive abstract. The input box for the author is seeded with the currently logged on user's name, but this can be overwritten. The contributor indexes the document by selecting a topic and country from provided drop down lists. Generic choices are available from each list. The contributor also selects a file to upload by browsing his local file system for the document.

Information about the file is automatically detected by the uploading process, including file name, file size and file type or extension. If a file with the same name already exists on the server, the file currently being uploaded is given a computer-generated name to guarantee a unique file name, and to prevent overwriting already existing documents. Files with spaces and other punctuation in the title that can confuse some browsers are renamed to replace the punctuation with underscores. Both the original file name and any newly generated file name are stored in the system. A file type security review is in place to prevent users from uploading executable and script files to the server. The date of posting and the contributor’s identity are also automatically recorded.

Once documents are added to the site, they are displayed for retrieval in a manner similar to the case studies and related sites: they are filtered by topic and country. Users can switch between index categories and category groupings to try to find relevant documents.

The document listing displays the title of the document, the author, a link to the actual document file on the server, a link to the detail view for a given document and an estimated download time. The estimated download time is automatically
determined from the size of the file as recorded during upload and shows the amount of time it would take to download the document over a 28.8 baud modem. Most of the community participants reside outside of the United States and have varying bandwidth availability, so 28.8 was determined to be a meaningful measure of speed for the broadest number of users.

If the user chooses to view the detail for the document, all fields are displayed, including the full text of the abstract. A link to the document and the calculated download speed are also shown within the detail screen.

4.2.7 Discussion Forum

A discussion forum is a piece of software that facilitates the exchange of messages between participants. These messages are threaded by subject and distributed to a list of subscribed members, although messages are posted or sent to a single role based address. Message exchange can take place in a newsgroup, bulletin board style setting, or over e-mail.

This module is crucial to a distributed network such as the DDialouge, where many participants may have limited Internet access. Those participants who do not have a permanent or quick Internet connection might be able to participate over electronic mail in a way that they cannot fully participate on a website. If they can connect for a brief period, they can download mail, respond to it offline, connect again and transmit their responses. They cannot interact with a website in the same way, as all viewing must occur while connected to the Internet.
This module presented significant technical hurdles in terms of integration and implementation. There are many existing, robust discussion forum software packages available, one of which needed to be used instead of attempting to re-code all of typical forum features in a custom version. This meant that another piece of software needed to work alongside the DDialogue website. In an ideal situation, the forum needed to integrate fully so that the user would have a single, unified use experience, rather than a broken, split one.

The ideal discussion forum software would:

- be low cost
- allow for e-mail subscriptions (so that participants could receive postings directly in their e-mail box)
- allow for all discussion threads and archives to be available on a website
- integrate the look of the community website into the forum website, to provide a consistent look and environment for the site participants
- share log-in credentials between the community website and the forum website, so users do not have to log into each section, and to remember username and passwords for each section
- support multiple languages.

Listserv-Lite (http://www.lsoft.com/products/default.asp?item=listserv_lite) met all of these criteria except for the sharing of login credentials. However, it runs in CGI space on the web server, which was not allowed in the hosting organization’s web environment for security reasons.

Eventually, discussion forums were set up with Yahoo groups. (groups.yahoo.com)

This was a free solution, which allowed for e-mail and web traffic. A French
discussion group was set up on the French Yahoo site, which covered the language support issue. However, the look of the Yahoo group site does not match the look of the community website and the login credentials for each site are different. To move between the forum site and the community site, a user has to enter another username and password set. Therefore, the forum site is not integrated into the community site, and the user experience moving between the two is not seamless.

The actual implementation of the discussion forums may have had a negative effect on their potential use. The discussion forums were set up and released several months after the community site release. The majority of participants had already joined the community site, and therefore they were not automatically signed up for a forum at the time they joined the DDialogue, as had been planned. All existing participants were invited to join a forum site, however since this was an extra step for participants and it came so late, the invitation was not widely accepted. Also, since the release of the forums was so delayed, a large opportunity was probably lost, in that the momentum of the new site could not be converted. The ability to participate over e-mail instead solely over the Internet may have lost some potential participants without permanent Internet connections.

4.2.8 Hot Topics

The intention for the hot topic section was for a new question or short essay to be posted by community organizers once every three months. Participants would read the new topic, and then converse about it in the discussion forum for the site.

Although suggestions on hot topics are welcome from all participants, only site administrators have the privileges to post them. This was to ensure that a posting
for a topic would stay present on the community site for a set period of time without
being overwritten. In practice, new hot topics have not regularly posted on the site.
Also, the discussion forums have not been used to discuss the topics that were
available, perhaps due to the synchronization problems between site release and
forum release.

The title of the current hot topic appears as a teaser on the home page of the site,
along with the date on which it was posted. If users click on the topic title, or the hot
topic option from the menu, they will be taken to the full text of the current hot
topic.

Archived topics are also available on the site and are listed in descending
chronological order. To view the full text of an old topic, the user clicks on the title of
the topic in the archive list.

4.3 Subscriptions

Participants can subscribe to receive notifications of new additions to the website via
e-mail. Any notifications are sent to the e-mail address listed in the member’s
profile. The subscriptions serve a dual purpose of community connection and
marketing. Participants are provided a service of keeping in touch with the
community and its activities. The site is provided a marketing service because users
are reminded to return and visit the site. In returning to the site, users may discover
that they have related content to contribute and then add new items during their
visit.
The actual implementation of the subscriptions on this site is somewhat overcomplicated. Users are given the choice of receiving notification in individual form (anytime anyone adds an item to the site) or in weekly digest form (once a week on Wednesdays). They are given a further choice of whether they want to receive notifications (individual or digest) for all types of items or for individual types of items. For example, a user could choose to receive individual notifications of just news and documents, or could choose to receive a digest of just related sites and experiences, or could choose to receive individual notifications of all or a digest of all.

The myriad of choice seems to be somewhat overwhelming and users who choose to subscribe have for the most part elected to get the digest or individual notifications of all items. The granular options of selecting particular content types have for the most part been ignored, and therefore these options tend to clutter up the subscriptions interface and may confuse users.

The registration form for new participants contains a check box that indicates that the user will receive notifications. By default, this box is unchecked, but if users check this box on the registration form before submitting, they will receive notifications. Users can modify their subscription options from the website at any time.

The content of the notification messages depends on the user's individual subscription choices; however, some elements are consistent. Items which users want to be notified of will be listed, usually by title. The bottom of each message reminds them of the URL for the site, and that they can unsubscribe from notifications at any time from the site.
After content items are contributed to the site, the system checks through the subscription table in the database to see who needs to receive notification of the new item. Then dynamic e-mail messages containing item information are sent by the server to the appropriate recipients.

The server also runs a scheduled process on a weekly basis to see if any new items have been added to the site. If there are new items, the system checks the subscription table to determine appropriate recipients and sends an automated dynamic e-mail containing a digested list of new items. A flag for each item in each module table in the database is set so that future notification messages will not repeatedly include these items.

4.4 Help Sections

Site administrators have the capability of adding instructive text for any module using web-based forms to manage the content. If help text is available for a site section, a linked question mark icon appears in the section title banner. Clicking on the question mark link would open up a smaller pop-up window to which the user could refer while working in the main window.

An example of help text is to explain the registration procedures for new members. To date, very little help text has been added to the site.

4.5 Search

Module level searches are provided for the participants, news, events, experiences, related sites, document library and hot topic sections. The initiation point of these
searches is only available from that module, and the results of these searches are restricted to items within that section. In most cases, the search process seeks matches in the main database fields for that module. These matches are fuzzy, so a search on 'manage' will return hits for 'manage' and 'manages.' The document library search process is enhanced by seeking a match against a full text index of the document collection in addition to search the major database fields. A full text search for 'manage' in the documents section would return hits for 'manage,' 'manages' and 'managing,' because word stemming is available in the full text index.

A site-wide search is also available from the left-hand menu. The site-wide search combines all module level searches together on one page and adds in results from the overview (project overview, project contact information, site partners) and help pages as well. Search results for the site-wide search are broken down into site sections. Clicking on the title for a search hit will return the user to the module in which the result appears.

4.6 Images

Images can be uploaded to the site and associated with any content item in the participants, news, events, experiences, or document library modules. Because of bandwidth concerns for users visiting the site, it was decided that images would not appear on the same page as or embedded in the contributed item, but instead a link to all associated images would be provided. It was feared that a slow pace of image download might dissuade some users from waiting for an item detail page to load, and valuable content would go unviewed as a result.
On the detail page for any item in the participants, news, events, experiences or library sections, if any images are available, a link appears to 'view associated images.' Multiple images can be associated with a single content item, and they are displayed vertically down the page, along with any caption the contributor may have chosen to provide.

If a user is logged in, a button is displayed which, if clicked, allows them to associate images with the item. This button only appears if the current user is the contributor of the item or an administrator.

In addition to adding more visual excitement to the site, it was also hoped that the ability to contribute images would also serve a very practical purpose: community development. Participants can upload pictures of themselves to accompany their member profile. This would be one way in which a geographically distributed network of people could get to know each other in a very human way, by recognizing one another's faces.

Another application of the inclusion of images might be to flesh out a news story about the installation of a VSAT satellite connection by providing a picture of the satellite dish. A calendar event for an upcoming conference might be better marketed with a photograph of last year's participants, if community members could see how many colleagues attend and kind of networking opportunity it might provide. Therefore, the site modules could benefit from having associated images both in terms of human interest and example illustration or visual demonstration.
4.7 Security

A 'login' option is available from the standard left-hand menu for the site. If a user clicks on the login option on the menu, the system will remember what page the user was on when login was requested. If the login attempt is successful, the system will return the user to that page after the authentication process is completed. When a user is logged in, the left-hand menu login option is replaced with an option to log out of the site. A login session will time out after two hours of inactivity on the site.

For users who cannot remember their username or password, the login page includes a function to have the login credentials mailed to the user. The user enters his e-mail address in to the space provided. If there is a match between the address provided and a participant registration in the database, the username and password will be e-mailed to that participant's address. Users cannot have their credentials mailed to any e-mail address other than the one with which they registered for security reasons. Therefore, users who do not visit the site on a regular basis and may not remember what they chose for a username and password should still be able to access the site if they utilize this reminder feature.

Some menu options and action buttons appear only if a user is logged into the site, such as a 'Add a new [item]' button on the main page of each module section, or an 'administration' option of the left-hand menu. Additional security checks were programmed into the site on pages that require privileges, so users cannot simply type in the address of a privileged page and bypass the security controlled navigation. Security checks will redirect users to another page on the site if the user is not logged in or does not have appropriate privileges for the page they are trying to access.
4.8 Safety

Documents on the site are regularly scanned for viruses. Therefore the files contributed by members should be virus free and safe for other members to download and use.

4.9 Language Implementation

Although the community website has been discussed in terms of a single site, there are actually two discrete sites divided by language. A French language site was developed first, and an English language one was released a few months afterwards. The sites are identical in terms of structure, and the fixed text, menu items and confirmation messaging are translations of one another. The content contributed by community participants is different on each site. When participants join, they are only joining one of the language versions of the site, not both. Participants can choose to sign up at each site separately.

The steering committee for the Francophone site objected to the splitting of the community along such colonial lines, but at that time, both sites had already been developed. It was unclear if participants would benefit from having content in both languages together on the same site. Current machine translation technology is somewhat imperfect and can be slow, if the contents of a whole web page are being sent to another web page for translation. If content was available in both languages, it seemed likely that users could be burdened by having to sift through content in order to find an item that they could read.
To bring the two sites closer together, a link in the top banner was added to each site, to cross-link to the site in the other language. There is also a gateway page with its own domain address that allows users to select the Anglophone or Francophone site. This gateway page also serves to heighten awareness that the other language version of the site exists, and is the only official address given out for the site. The gateway site defaults to display in French or English depending on the language preferences set up in the user's browser, or the version of the browser being used. Finally, links to translate the current page into another language via AltaVista's translation tool are available under the menu on every page.

4.10 Hosting

The gateway site and the Anglophone version of the site are hosted on web servers run by the organization who built the websites. The Francophone site was transferred to a host organization in Benin about a year and a half after the initial release of the site. In the interim, the site was hosted on the developing organization's machines, but at a beta address. It was not transferred to use the domain that was registered for the Francophone site until the switchover to Benin.

Individual notifications of new items posted to the site were sent in this interim hosting period, however, the digest notifications were not turned on. This was done so that the beta address would not be released within an e-mail message, because it was anticipated that the real domain address would be available earlier than it was.
5. Communications and Marketing

To introduce the community and its website to potential participants, kick-off conferences were held in many of the participating nations. These nations include Benin, Ghana, Senegal, Cote d'Ivoire, Guinea and Mali. In the French speaking countries, members of the Francophone steering committee recruited conference attendees, who were mostly staff from local and international NGOs, as well as government employees. For the Ghana roundtable, the attendee population was derived from these same occupations, plus journalists.

At the kick-off conferences, presentations and discussions about decentralization were held, then the attendees were introduced to the DDialogue website. The content sections of the site were reviewed and an item contribution was demonstrated. Conference attendees were then encouraged to join and contribute a test news item, in part to demonstrate the ease of use of the site for adding content.

Conference staff aided those unfamiliar with computers, or with web sites, and helped to develop some basic computer use skills. Some attendees without e-mail addresses were walked through signing up for one via free services such as Hotmail and Yahoo.

The Ghana kick off included a unique feature: an electronic ribbon cutting. Conference attendees were seated at computers in a training facility, which were opened to a screen showing the home page of the website overlaid by a graphic of a red ribbon and an open pair of scissors. All the attendees clicked on their respective mouse buttons simultaneously, which launched a Flash animation of the scissors cutting through the ribbon, thereby opening the site to all the users. Also, at the
Ghana roundtable, kick-off attendees signed a pledge to signify their commitment to making democratic decentralization work. These signatures and the commitment statement were printed onto a poster used to promote involvement in the DDialogue. (DDialogue, 2001c)

Journalists invited to participate in the Ghana roundtable published articles about the conference and continued to follow some of the issues discussed. This not only increased awareness of decentralization, it also brought some attention to the existence of the community and to the website.

In addition to kick off conferences, the website was also presented and demonstrated at conferences held by the funding agency. This introduced the site to potential participants who might reside in a country where the DDialogue had not been officially launched. These conference attendees were staff of aid agencies or NGOs who work on development issues such as decentralization, governance, health and education.

Printed, non-interactive communication was also employed. The hosting agency in Africa had some t-shirts made up from the banner logo on the site. These shirts had the title of the Decentralization Dialogue community, and the URL of the gateway website for the community. These shirts were distributed to conference attendees, who agreed "to wear [them] to promote participation." (DDialogue, 2001c)

Business cards, too, were printed and distributed at meetings and conferences. One side of the card was in French and the other in English. The text on each side contained the name of the community, and the URL of the gateway site. A black and white version of the web graphic was also printed on the card.
The subscription aspect of the website is used as an auxiliary communication tool. As items are posted, subscribed participants are notified of the new content, which they might find useful. They are also reminded of the existence of the website and may remember that they, too, have something they would like to post on it. As a communication tool to aid community growth, though, the notifications are somewhat regressive. In order to be reminded of the site, someone has to post something on the site. If the community has not reached critical mass, and no one is posting anything, the site is more likely to drift into oblivion as no one is being reminded of it.

Finally, the website has been crawled by search engines. Potential new users who are familiar with the issues and topics covered on the DDialogue may come upon it while searching on related terms.

6. Lessons Learned

Without consulting the site participants, and without consulting the literature, there is much to be learned directly from the experience of building the community website that can be applied to future online community development.

Lesson 1: Ready the Discussion Forum

Even if there are significant technology hurdles in incorporating a discussion forum, it should be ready and released at the same time as the rest of the site, to capitalize on the momentum of the community kick off and to be available to new joiners. It should be integrated as much as possible with the site, because it is difficult for
users to keep up with multiple usernames and passwords. This is especially true when different credentials are needed to access two sections of a site that should appear as one entity.

One potential solution for Cold Fusion websites is a product called FuseTalk. FuseTalk is based in Cold Fusion, so it is fairly easy to integrate the look and feel of a website into a discussion forum. It also allows for a shared security realm, so users could log on to the main portion of the community website and be authenticated for the discussion forum without having to log in again. This product was not available at the time of development of the DDialoque

Lesson 2: Integrate the Languages

The two discrete sites of the DDialoque should have been built as one, with the fixed text on the site defaulting to one language or the other based on browser version and preferences.

Two sites artificially restrict interaction between members of the community at large, as an NGO employee working on local government issues in Ghana could just as easily learn from someone else's experience in Benin as she could from an experience in Uganda.

Two major tools could be used to manage the language differences on a site: machine translation tools and filters. Although machine translation is presently far from perfect, a translation could give a user enough of the gist of an entry to determine if it would be sufficiently valuable to pursue. Filters could also be used, so that if a visitor who only spoke English visited the site, only the content in English
would be presented if that were desired. This would remove the task of sifting through content to find an item that could be read.

As with any technology venture, it is a good idea to poll some users or potential users before development. In this case, it is likely that users would have opted for a unified site. Participants may be polyglots, and might have appreciated an easier opportunity to be connected to others working on the same issues as they, regardless of what language they predominantly speak.

Lesson 3: Use registered domain addresses instead of an interim address

Once a domain is registered for an online community, that address should be used, even if the permanent hosting solution has not been determined. The use of the permanent domain might have made it trickier to transition from one host to another, as most domain name server switchovers take twenty-four hours. On a site with user contributed content, the content must also be synchronized during a switchover.

The benefits of a consistent address, however, are greater than the toils of managing a switchover. Users are familiar with the address, and do not have to make a mental adjustment of bookmark change when a simple change of host machine occurs.

In this case, the delay to use the permanent address instead on temporary beta one meant that the digest notifications for the French site were not turned on for a year and a half. This may have lost some of that site's participants as those who registered for the digest and then received nothing could have easily forgotten about the site.
Lesson 4: Keep Community Discussion Catalysts Fresh

On the DDialogue, the Hot Topics should be updated and replaced on a regular basis. If the participation level of the community starts to drop off, then the site organizers can rekindle it by reminding users about the site. An engaging hot topic might re-connect participants and keep the community alive.

Lesson 5: Simplify Subscription Choices

Subscription choices should be reduced to two: digest or individual notifications, and HTML type e-mail or plain text. The mix and match choices available on the DDialogue made the subscription interface too confusing. Most users opted for notification of all items individually or a digest of all items instead of picking notifications for individual modules anyway. Even with too many choices present, the DDialogue does not give users the opportunity to select whether they want to receive plain text or HTML styled e-mail. Those who can receive HTML e-mail therefore receive a somewhat ugly ASCII message, when they could be receiving a more professional message that might entice them more to visit the site.

7. Actual Site Use

A summary of the actual number of postings to each language version of the site for each user contributed content module can be found in Table 1. This table excludes the participants module, as no additional information is contributed there after registration, but includes hot topics, which can be added only by administrators.
This table represents the quantity of actual items posted, but makes no statement about the quality. Some of these items may have been test contributions that were not removed after experimentation. Also, the summary count does not discriminate based on the identity of the contributor. All contributions were counted, even if they were made by an employee of a hosting organization.

<table>
<thead>
<tr>
<th>Module</th>
<th>Francophone</th>
<th>Anglophone</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>News</td>
<td>100</td>
<td>62</td>
<td>162</td>
</tr>
<tr>
<td>Events</td>
<td>5</td>
<td>22</td>
<td>27</td>
</tr>
<tr>
<td>Experiences</td>
<td>14</td>
<td>7</td>
<td>21</td>
</tr>
<tr>
<td>Related Sites</td>
<td>101</td>
<td>22</td>
<td>123</td>
</tr>
<tr>
<td>Document Library</td>
<td>36</td>
<td>36</td>
<td>72</td>
</tr>
<tr>
<td>Discussion Forum</td>
<td>13</td>
<td>5</td>
<td>18</td>
</tr>
<tr>
<td>Hot Topics</td>
<td>5</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>274</strong></td>
<td><strong>157</strong></td>
<td><strong>431</strong></td>
</tr>
</tbody>
</table>

The Francophone site had been available for almost two years and the Anglophone, for a year and half when these counts were compiled. Activity on each seems low, and there are long stretches of time when nothing is posted at all.

Website traffic logs may also reveal information site activity, although it is sometimes difficult to tell whether a site request has been made by a person or by an automated agent, such as an indexing robot. Charts I and II below represent a count of successful requests for each site. Web logs were only readily available for the Francophone site from October 2001 to July 2002, when the site moved to the African host. Anglophone logs were available from February 2002 to October 2002, with the October log being a few days shy of complete.

Each log was processed using Analog, a popular usage pattern analysis tool. (http://www.analog.cx/) The analysis excluded any requests for image files, and excluded requests from IP addresses within the domain of the American hosting organization. This exclusion covers both personal workstations and the organization's
corporate indexers, so visits by employees of this hosting organization would not have been counted. Some known indexing robots were also eliminated. Visits from the employees of the African hosting organization are not excluded.

On average, there were 870 hits on the Francophone site per month over ten months. There was an average of 826 hits on the Anglophone site each month over nine months, however the same months were not each evaluated in each case. Also, the Anglophone traffic was more consistent, while the Francophone traffic had one significant spike with several low-traffic months. No analysis was performed to determine the cause of this spike.

**Chart I**

**Francophone Website Requests**

![Chart showing Francophone Website Requests](chart.png)
From these numbers, it would appear that the sites are being visited fairly regularly, so the community site may be successful as a resource even if the number of contributions is meager. However, the figures may be misleading, as they may not represent visits to the site by human users. The data for individual months reveal that in many months, between one quarter and one half of all requests originated from the same organization. This could mean one user really worked the site, or a robot accounted for the majority of hits in a given month.

If this is an accurate representation of actual human traffic, then the site is being visited and used. However, the number of contributions remains disproportionately low relative to the hits. For the community to grow and be successful, it is imperative to determine what keeps members from adding content to the site, and what would encourage them to become more active.
8. Possible Barriers to Participation

Following the three legged stool theory of successful community development, there are three factors, which might influence member participation: access to the community, communication, and useful content. These and other potential factors were explored to develop a survey instrument sent to DDialogue community members. In conjunction with lessons learned from the development experience and findings in the literature, survey results from the community should provide some indication of why members are not using the site.

8.1 Access

In the context of the DDialogue, access to the community means access to the Internet. 2001 estimates for Internet usage suggest that only one in 160 or one in 100 of the 816 million people in Africa use or have access to the Internet. (Jensen, 2002 and International Development Resource Centre [IDRC], 2002, respectively) It seems likely that many of the registered and potential participants do not have access, and those that do might have limited or slow access. Members working in rural areas on local government development are the hardest hit by these circumstances, as most of the bandwidth and connections are available only in the capital or major cities.

Restricted or slow access might mean that members could realistically participate over e-mail, because they can compose and read offline and use connection time only for sending and receiving. However, it might prevent them from participating directly on a website, and for the DDialogue, the website is the home of the content. Although the page weight for the DDialogue was designed to be less than 52...
Kilobytes, download time for site pages and especially for contributed documents could be prohibitive.

In March 2002, the Acacia Program Initiative of the International Development Research Centre measured publicly available bandwidth for the whole continent. (IDRC, 2002) Recognizing that a count of the number of users would have been inaccurate due to many factors such as account sharing and cyber café usage, Acacia measured instead the 'size of the pipe' by gathering data about the international bandwidth available for the gateways in each country.

International bandwidth is a significant measure, because 75-90% of all Internet traffic in developing countries is international. (IDRC, 2002) With the exception of pipes between South Africa and many of her neighbors, and Senegal to Gambia, there is virtually no intra-African connectivity. This means that most Internet traffic between African nations is routed via North America or Europe. If a user in Ghana wants to view the Francophone DDialgue site, the request to view the site may be routed to perhaps Canada or Spain, then to Benin. Then the website page packets would be routed back through Canada or Spain, then back to Ghana.

It should be noted that the Acacia study looked only at public bandwidth, i.e. access that could be purchased through a cyber café, and ISP or a telecom provider. Private gateways are also available in many African nations, in the form of privately purchased VSAT satellite connections. Statistics were not readily available for these connections, but some large or foreign organizations, including many of the larger NGOs use private VSAT connections for their work.
A summary of the publicly available international bandwidth for the DDialogue nations can be found in Table 2, and a few other nations are also included for comparison. Exact figures are not available for nations with less than 30 Megabits per second (Mbps) of bandwidth, but all nations are charted in order against a scale of Mbps in increments of five and their access can be estimated. The figures given for those nations are approximated and preceded by a tilde.

<table>
<thead>
<tr>
<th>Country</th>
<th>Total International Bandwidth (Mbps)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Egypt</td>
<td>535</td>
</tr>
<tr>
<td>South Africa</td>
<td>343</td>
</tr>
<tr>
<td>Morocco</td>
<td>135</td>
</tr>
<tr>
<td>Tunisia</td>
<td>75</td>
</tr>
<tr>
<td>Senegal</td>
<td>48</td>
</tr>
<tr>
<td>Kenya</td>
<td>~27</td>
</tr>
<tr>
<td>Uganda</td>
<td>~8</td>
</tr>
<tr>
<td>Cameroon</td>
<td>~8</td>
</tr>
<tr>
<td>Cote d'Ivoire</td>
<td>~7</td>
</tr>
<tr>
<td>Ghana</td>
<td>~4</td>
</tr>
<tr>
<td>Mali</td>
<td>~4</td>
</tr>
<tr>
<td>Benin</td>
<td>~3</td>
</tr>
<tr>
<td>Guinea</td>
<td>~2</td>
</tr>
<tr>
<td>Burkina Faso</td>
<td>~1</td>
</tr>
</tbody>
</table>

(Source: IDRC)

By comparison, an American household with a cable modem connection might have 1.5 Mbps available just for that household, depending on the load on that shared connection.

The good news is that bandwidth in Africa grew 89% between 2000 and 2001, and will continue to grow. (Pastore, 2001) Much of this increase in bandwidth will come from the installation of the West African marine fiber cable (WASC) completed in 2002, which should spur further intra-African connectivity. (IDRC, 2002)
Table 3 shows bandwidth increase by regions of the world between 2000 and 2001, and paints a vivid picture of the digital divide between African nations and other parts of the world.

<table>
<thead>
<tr>
<th>Region</th>
<th>2000 (Mbps)</th>
<th>2001 (Mbps)</th>
<th>Percent Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>649.2</td>
<td>1,230.8</td>
<td>89.6%</td>
</tr>
<tr>
<td>Asia</td>
<td>22,965.1</td>
<td>52,661.9</td>
<td>129.3%</td>
</tr>
<tr>
<td>Europe</td>
<td>232,316.7</td>
<td>675,637.3</td>
<td>190.8%</td>
</tr>
<tr>
<td>Latin America</td>
<td>2,785.2</td>
<td>16,132.5</td>
<td>479.2%</td>
</tr>
<tr>
<td>US &amp; Canada</td>
<td>112,222.0</td>
<td>274,184.9</td>
<td>144.3%</td>
</tr>
</tbody>
</table>

(Source: Pastore, TeleGeography data)

Even with this growth, there are two remaining aspects to Internet connectivity in Africa: cost and congestion. A 2002 status report of the African Internet estimated that a dial up account for twenty hours of service a month cost about $60, inclusive of usage fees and telephone time. Two years earlier, the estimates for the same number of hours of service in the United States came in at $22 monthly, but average salaries are at least ten times higher than in Africa. This report notes that "sixty dollars a month is higher than the average African salary." Many can afford connectivity, though, and they are still faced with "substantial congestion in peak times." (Jensen, 2002)

While the general information available for Africa clearly suggests that Internet connectivity could be a potential barrier to site use, there is also some information available specifically for DDialogue members, which support this hypothesis. At the roundtable for the Ghana launch of the DDialogue in early 2001, some participants responded to a survey about their Internet access and use. (DDialogue, 2001b) Five respondents indicated that they had been using the Internet for less that a year, fourteen, for more than one year and thirteen indicated that they do not use the
Internet. Further, ten of sixteen respondents characterized page download speed while browsing the Internet as somewhat slow, while six described it as somewhat fast and three, as very slow. No participants indicated that their download speed was very fast.

Perhaps most importantly, the response rates were consistently higher for the question to non-Internet related computer use. Roundtable participants indicated that they use computers for word processing (23), spreadsheets (14), presentations (8) and databases (11). This may indicate that at that time computers were in use more for local activities then Internet ones. (DDialogue, 2001b)

Summary results of the evaluation for the entire Ghanaian roundtable also indicated that Internet access might be a significant barrier to participation. While more than a few respondents noted that Internet access would be a "major issue," others commented that actual computer access rather than Internet access could be a problem. "Yes, but what happens to those without computers?" queried one participant, while another noted that "the long term view should be to equip or assist at least the regions to acquire the hardware." (DDialogue, 2001a)

8.2 Communication

Many different approaches were taken for introducing the community to potential participants, including kick-off conferences, presentations, t-shirts, business cards, word of mouth, and a search engine presence.

The designed method of ongoing communication, new item notifications, was highly dependent on getting the cycle started. Participants have to add new content for
notifications to go out. If no one is contributing, no one is being reminded of the site, and the cycle continues.

Therefore, another potential barrier to participation may be lack of awareness. Ongoing communication and marketing may be needed to keep the DDialogue more present in the minds of potential contributors.

8.3 Usefulness

The perceived value of the content on the site may be another example of a vicious cycle. If the members do not feel that the content on the site is useful, they may not visit and may be less inclined to make the effort to contribute information themselves.

8.4 Other Potential Barriers

Ease of Use

The Ghana Roundtable Evaluation Summary results, available on the community site, include many comments from participants, who thought the site was easy to use. One attendee commented that it "has been very easy for beginners to get on the site," while another noted that the "information on the website is very clear and easy to use." Ratings on a scale of one to five for the quality of roundtable materials, including the website, were all good to excellent. No user indicates that the quality was less than good, but these ratings apply to all materials and not just the website. (DDialogue, 2001a)
However, some users did experience some trouble. One pointed out that "some are not computer literate and had to follow with difficulty, especially at the website."
Another attendee observed that "more effort would have been useful to assist computer illiterates." (DDialogue, 2001a)

From these comments, it is clear that the site is not equally easy to use for everyone and that this could be a factor in participation on the site. However, it could be construed that those that experienced difficulty are in general unfamiliar with computers. The difficulty therefore could be associated with computers at large rather than this site in particular.

*Computer Comfort*

It follows, then, that some registered participants do not find computers easy to use in general. This suggestion is supported in existing research. In a study on information sharing over electronic media, Jarvenpaa and Staples (2000) hypothesized that a higher level of comfort with using computers is associated with use of collaborative electronic tools. (p. 136) The survey for their study included items from computer anxiety rating scales developed by Heinssen, et al. (1987) and computer playfulness scales developed Webster and Matocchio (1992).

While the use of complex rating scales to measure computer anxiety or ease may not be appropriate for the survey sent to this site's participants, it could be assumed that comfort with computers might increase the likeliness of participation on the site. Conversely, computer anxiety may keep participants from visiting the site, or contributing items to it.
**Propensity to Share**

The Jarvenpaa and Staples study also tested a theory of Constant, et al. (1994), that a general tendency to share information would affect use of collaborative electronic media. If the DDialogue participants are not sharing any information with others about decentralization at all, they would not be using the site to do so either. Thus, a general tendency not to share could also inhibit use of the site for contribution.

This hypothesis can also be expanded to the general propensity to seek information. If group members are not seeking information about decentralization, they would have no reason to visit to site as a guest.

**Trust**

Why would members choose *not* to share if they had information? Kimble, Li and Barlow (2000) examined case studies of communities of practice implemented with virtual teams in an organizational setting. He found that, particularly with works-in-progress, the case study subjects were unwilling to share works electronically because of trust issues. Software developers were unlikely to share incomplete programs with other developers. Consultants and market researchers were similarly reluctant to share incomplete reports or materials with their co-workers. Kimble, et al., note that "these behaviors are indicative of a lack of trust within the virtual teams." (p. 9) The trust issues became more significant when subjects were faced with sharing knowledge with people from other organizations.

Since the DDialogue is cross-organizational, perhaps there are some feelings of distrust about sharing information with other members. It may also be that members feel exposed about placing their work on the public Internet, where any browser may find and read it. This may be particularly true of telling cautionary tales: stories of
failure which could illustrate a lesson to others, but place the contributor or her organization in a bad light.

Time
People are busy and it takes time to contribute items to the DDialogue, even a short news article or link. Perhaps people do not share information because they do not have time to compose it.

Face to face meetings
Although the DDialogue had initial kick-off meetings face to face, these have not continued because of logistical and financial difficulties. Members may prefer to share the information that they have in person. Based on the findings of other researchers, Kimble, et al., (2000) remarked that "workers may also find it difficult to abandon a familiar working environment and face the challenges of new technologies and new social arrangements" (p. 9). From the case studies they looked at, trust and group identity were both developed through personal meetings.

A Pew Internet & American Life project survey of almost 1700 American Internet users in early 2001 found that 84% of Internet users have contacted an online group. 56% of these joined an online group after discovering it on the Internet and 40% said they used the Internet to help them become more involved with a group that they already belonged to. This study also quotes Katie Hafner of San Francisco's The Well community as saying that the group gained energy after members had met face to face.

For the DDialogue, this may imply that members who already meet with or know other members may be more active participants.
9. Participant Survey

9.1 Introduction

To evaluate factors in participation and non-participation on the community website, a questionnaire was developed to probe potential barriers identified from the site development model and experience. The core questions measured potential factors in participation, including:

- A participant’s access to the Internet
- The speed of that access
- Communication about and promotion for the site
- Utility of the site content
- Participant comfort with computer use
- Tendency to share and seek information about decentralization
- Trust factors
- Physical reinforcement of the community by face to face meetings

Other questions gauged frequency of site use and contributions to the site by participants. Finally, demographic questions were included to evaluate gender, age and country of residence of the respondents. The questionnaire was developed in English and translated into French for delivery to the Francophone site members. Both versions of the questionnaire can be found in the Appendix.
9.2 Respondent Population

A list of all the registered members for both the Francophone and Anglophone versions of the site was compiled into a questionnaire recruitment list for each site.

Members known to be employees of either of the two hosting organizations were removed from the recruitment list, as they were heavily involved with the development of both the community and its website. Participants with no e-mail address saved in their member profile were also removed as candidates, as there was not an effective point of contact to reach these members. Although a unique e-mail address was required for registration by site policy, some exceptions were made and some members of the original Leland site did not have one on file when they were migrated to join the DDialogue. Registrations that were obvious duplications of another existing profile were also excluded, so potential respondents would not receive multiple invitations to participate.

Ultimately, the questionnaire was sent to 333 registered participants of the community website. Table 4 below breaks down the number of potential respondents by language version of the site and reasons for ineligibility.

<table>
<thead>
<tr>
<th></th>
<th>Francophone</th>
<th>Anglophone</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Registered Members</td>
<td>240</td>
<td>155</td>
<td>395</td>
</tr>
<tr>
<td>Employees of Host Orgs</td>
<td>15</td>
<td>21</td>
<td>35</td>
</tr>
<tr>
<td>Members w/o e-mail addr</td>
<td>11</td>
<td>9</td>
<td>20</td>
</tr>
<tr>
<td>Obvious duplicate reg</td>
<td>3</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td><strong>Candidates to recruit</strong></td>
<td><strong>211</strong></td>
<td><strong>120</strong></td>
<td><strong>333</strong></td>
</tr>
</tbody>
</table>
9.3 Distribution Method

The questionnaire was distributed over electronic mail for a number of logistical reasons. First, the geographic distribution of community members precluded in-person interviews, and associated costs of telephoning or faxing over such a distribution obviated the feasibility of these two approaches. Therefore the only realistic distribution methods were on paper and via electronic mail.

At the time of registration, electronic mail addresses were required, with a few exceptions, before a member could join. Physical addresses were not required for enrollment, although they were provided by many registrants. On the Francophone site, e-mail addresses were available for 214 of the 225 total members, while physical addresses were available only for 184. On the Anglophone site, 127 e-mail addresses and 106 physical addresses were available for the 134 members. These figures exclude known employees of the host organizations.

Even though the number of potential respondents was slightly higher for e-mail distribution, it could be argued that the survey would actually reach more respondents if sent on paper through the postal system. Many of the kick-off conference attendees did not have an e-mail address, personal or business, at their disposal. Several of these signed up for a free Hotmail or Yahoo e-mail accounts during the roundtable meetings and registered on the community website with them. However, it is unknown if these accounts were ever used or checked again. Also, many participants could have switched e-mail addresses without updating their profile on the site, if they changed jobs, forgot their free account password, or were trying to avoid spam messages sent to their old account. Consequently, outdated or
unchecked e-mail addresses might actually reduce the potential field of respondents, even though the number of available addresses was higher.

With the true number of potential respondents for each distribution method being unknown, the final decision to go with e-mail was based on logistical factors. First, delivery time with e-mail is faster, as it requires significantly more time to send and to receive surveys via international mail. Second, although the delivery success rate for e-mail is partially unknown, the postal delivery success rate for such a variety of foreign nations is also completely unknown. Finally, e-mail would not require the acquisition of return postage for unknown letter weights from twenty-five different countries.

The consequence of the distribution method decision is that questionnaire response will be biased towards those in the target population who have some Internet access. Those in rural areas or others completely without any access will probably not receive the questionnaire. It will be impossible to determine if non-response is a result of this decision.

**9.4 Questionnaire Delivery**

E-mail messages were sent to each of the eligible registered participants of the community website. This was done with the aid of an automated Cold Fusion script, which looped over the list of questionnaire recipients, and sent each an individual e-mail message containing an introductory letter and the questionnaire body.

There was a discrepancy between the number of potential Francophone recipients and the number of messages that appeared to be sent. While 211 members were
eligible, it appears that only 206 messages were sent for this group. This may be the result of duplicate addresses unnoticed by the researcher, but caught by the SMTP server which sent the mail. The reason for this discrepancy was not investigated.

For all messages sent, a total of seventeen bounce messages were received. Although it is likely that more addresses that these seventeen were bad addresses, these were the only official notifications received from the recipient e-mail host servers. The breakdown of messages sent and bounced can be found in Table 5.

<table>
<thead>
<tr>
<th></th>
<th>Francophone</th>
<th>Anglophone</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mail Messages Initiated</td>
<td>206</td>
<td>120</td>
<td>327</td>
</tr>
<tr>
<td>Bounced Messages</td>
<td>6</td>
<td>11</td>
<td>17</td>
</tr>
<tr>
<td><strong>Potentially Successful Messages</strong></td>
<td><strong>200</strong></td>
<td><strong>109</strong></td>
<td><strong>309</strong></td>
</tr>
</tbody>
</table>

Reminder Messages

Nine days after the original request was sent, a reminder message was sent to most of the outstanding target population. This reminder was not sent to those who had already responded to the questionnaire. Those addresses which had produced a bounce message were also excluded. Finally, recipients who had some correspondence with the researcher in the interim period but had not completed the questionnaire were not sent a reminder message.

The same five-message discrepancy that appeared in the first mailing to Francophone recipients recurred during the reminder mailing. Also, from this reduced population, a total of six new bounce messages were generated when the messages were sent.

Total numbers for sends and bounces for the reminder message can be found in Table 6.
Table 6

<table>
<thead>
<tr>
<th></th>
<th>Francophone</th>
<th>Anglophone</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mail Messages Initiated</td>
<td>185</td>
<td>103</td>
<td>288</td>
</tr>
<tr>
<td>Bounced Messages</td>
<td>4</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Potentially Successful Messages</td>
<td>176</td>
<td>101</td>
<td>277</td>
</tr>
</tbody>
</table>

**9.5 Results**

32 responses to the questionnaire were received, yielding a response rate of slightly higher than 10% of the 309 surveys sent out. Again, there is a response bias for participants on the DDDialogue who have Internet access, as these are the members of the population who could have received the questionnaire via e-mail. The response frequencies will be presented here because they provide a nice description of the responding population. It is unknown if these results are extendible to whole DDDialogue population. It seems likely that those members without Internet access would have responded differently, but this cannot be concluded for certain.

**9.5.1 Demographics**

Responses were received from Benin, Burkina Faso, Cameroon, Cote d'Ivoire, Ghana, Guinea, Mali, Senegal and outside Africa (the United States and United Kingdom). Some respondents currently residing outside of Africa stated their home African country and noted that they were only living outside of them temporarily. As temporary residence in the United Stated or United Kingdom would affect available Internet access, these responses were counted as countries outside of Africa.

23 men and 9 women responded. Three respondents were between the ages of twenty and thirty, 17 between thirty and forty, 9 between forty and fifty and 3 between fifty and sixty.
21 respondents answered the French language translation of the questionnaire, 11 answered the English.

### 9.5.2 Nominal Data

**Table 7**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Yes</th>
<th>No</th>
<th>NR/NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Received e-mail reminders about the site</td>
<td>20</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>Contributed an item to the site</td>
<td>11</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>Have face to face meetings with other members</td>
<td>12</td>
<td>19</td>
<td>1</td>
</tr>
<tr>
<td>Have Internet access at work</td>
<td>23</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Have Internet access at home</td>
<td>9</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>Share information with others about decentralization</td>
<td>28</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Share this information in person (conference/at work)</td>
<td>27</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Obtain information from others about decentralization</td>
<td>29</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Obtain this information in person (conference/at work)</td>
<td>27</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Actively participate on other websites</td>
<td>19</td>
<td>12</td>
<td>1</td>
</tr>
<tr>
<td>Actively participate in e-mail lists</td>
<td>23</td>
<td>9</td>
<td></td>
</tr>
</tbody>
</table>

(NR/NA = Non-Response or Not Applicable)

**Notes:**

- Two respondents have Internet access at home and do not have access at work. Otherwise, these populations overlap.
- Tallies for respondents who share or obtain information in person do not include those who responded that they do not share or obtain information. These responses are tallied as NR/NA for those counts.
- One response of "Don't know" for contributing items is counted as a "No" response, as were two "don't know" responses for meeting face to face.

### 9.5.3 Ordinal Data

Most respondents visited the community website one to nine times in the last year, although many visited it more frequently.
The overwhelming majority of respondents rated the content on the community website as useful, although these responses were close to evenly split between "very useful" and "somewhat useful." No respondents rated this site as "not useful."

For those respondents who have Internet connections at work, and indicated what type of connections they were, half have dial-up modem connections, while the others have a dedicated line, such as a Cable Modem, ADSL, T1 line or VSAT connection. All those who have a connection at home and indicated that type of connection have a dial-up connection.
Not surprisingly, the connection speed of the work Internet connections is perceived as being faster than the home connections. Most respondents consider their connection speed to be average, while none consider theirs to be very slow.

Contrary to expectations, some of those respondents with work Internet connections use them more times a day for visiting websites than for sending e-mail. This is not a quantification of how many sites they visit or how many messages they send, but rather how many sessions a day they spend on either activity. Some respondents do not visit websites on a daily basis, but do send e-mail daily.
The vast majority of these respondents are very comfortable with computers, which might be explained by the bias incurred by the distribution method. Those who are comfortable with computers are more likely to be checking their e-mail and responding to a questionnaire within e-mail.

Most participants became familiar with the website because of human interaction, such as a kick-off conference or other face to face meeting, or a colleague or friend who knew about the site. A couple of respondents found the site on through an Internet search engine. Printed materials alone, such as the business card and t-
shirt, did not alert many members to the existence of the site, but this number makes no judgment on their success rates when used in conjunction with human interaction.

![How Participants became familiar with the website](image)

Members who had contributed an item to the site were asked to rate the site in terms of ease of use for adding content. More members who responded to the question found the act of contributing content very or somewhat easy. No respondents reported that adding an item was very difficult. Again, the distribution method bias may play a role in the responses to this question.

![Ease of use of the site for item contribution](image)

9.5.4 Reasons for Non-Participation on the Website

Respondents who indicated that they have not contributed an item to the site were asked to select a reason why they have not done so. The top three reasons for non-
contribution were related to time, access to the site and communication about the site.

None of the respondents who had not contributed content to the site selected the trust based answer, "I do not want others to steal my ideas", as the primary reason for their non-contribution. At least for this particular population, it appears that trust is not an obstacle in exchanging information. This is tangentially consistent with Constant's Theory of Information Sharing, which in part states that people are likely to share information when the act is a social good or when the information is not their personal possession. (Constant, et al., 1994) The type of content that would be shared via DDialogue performs a civic good and belongs to no particular organization or person.

The summary of these results on non-participation appears in Table 8. Some respondents chose to write in their own answers; those write-ins that corresponded with the provided answers were compiled into those answer tallies. Provided answers and write in answers are both included in this summary table.

**Table 8**

<table>
<thead>
<tr>
<th>Reason for not contributing content</th>
<th>Responses</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Time</strong>: I do not have time to add information</td>
<td>5</td>
<td>22.73%</td>
</tr>
<tr>
<td><strong>Access</strong>: I cannot get to the website \ too slow</td>
<td>4</td>
<td>18.18%</td>
</tr>
<tr>
<td><strong>Communication</strong>: I forgot about the website</td>
<td>3</td>
<td>13.64%</td>
</tr>
<tr>
<td>Do not know how to use the site</td>
<td>2</td>
<td>9.09%</td>
</tr>
<tr>
<td>I do not have information to add</td>
<td>1</td>
<td>4.55%</td>
</tr>
<tr>
<td>Site not well designed</td>
<td>1</td>
<td>4.55%</td>
</tr>
<tr>
<td>Topic not relevant to me</td>
<td>1</td>
<td>4.55%</td>
</tr>
<tr>
<td>No participation on the site</td>
<td>1</td>
<td>4.55%</td>
</tr>
<tr>
<td>Country team has not decided who will post what</td>
<td>1</td>
<td>4.55%</td>
</tr>
<tr>
<td>I do not want others to steal my ideas</td>
<td>0</td>
<td>0.00%</td>
</tr>
<tr>
<td>No response</td>
<td>3</td>
<td>13.64%</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>22</td>
<td>100.00%</td>
</tr>
</tbody>
</table>
9.5.5 Correlation

Pearson Correlation Coefficients between contribution to the site and variables that could affect contribution can be found in Table 9. This table also includes correlation data to demonstrate the relationship between these variables and visits to the site.

Table 9

<table>
<thead>
<tr>
<th>Factors</th>
<th>Contribution to the site</th>
<th>Visits to the site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participating in other websites</td>
<td>.407</td>
<td>.139</td>
</tr>
<tr>
<td>Receiving Email Reminders</td>
<td>.245</td>
<td>.197</td>
</tr>
<tr>
<td>Utility of site content</td>
<td>.206</td>
<td>.232</td>
</tr>
<tr>
<td>Whether obtain info on decentralization</td>
<td>.195</td>
<td>.112</td>
</tr>
<tr>
<td>Computer Comfort</td>
<td>.188</td>
<td>.131</td>
</tr>
<tr>
<td>Internet access at home</td>
<td>.133</td>
<td>.246</td>
</tr>
<tr>
<td>Whether share info on decentralization</td>
<td>.075</td>
<td>-.004</td>
</tr>
<tr>
<td>Internet access at work</td>
<td>.014</td>
<td>.094</td>
</tr>
<tr>
<td>Participating in other email lists</td>
<td>-.133</td>
<td>-.057</td>
</tr>
<tr>
<td>Having face to face meetings</td>
<td>-.227</td>
<td>-.240</td>
</tr>
<tr>
<td>Source of familiarization</td>
<td>-.236</td>
<td>-.070</td>
</tr>
<tr>
<td>Ease of use</td>
<td>(a)</td>
<td>.279</td>
</tr>
</tbody>
</table>

(a) No correlation, as one variable is a constant. Ease of use was only measured for those who contributed an item.

Unfortunately, the only statistically significant correlation discovered is between participating in other websites and contributing to the DDialogue. This correlation has significance level of .02. Chi Square tests run on the same data support this relationship, and identified a few additional relationships for visits to the site, but not contributions to the site, as statistically significant. These other significant relationships suggested by Chi Square tests are between visits to the site and:

- perceived site usefulness
• receiving e-mail reminders about the site
• obtaining information from others in person and
• participating on other websites

While the connection between participation on other sites and participation on the DDialogue is logical, it does not present a solution for the lack of activity in the community. If community organizers are going to encourage any online participation, it may as well be for this website.

Although this data appears inconclusive, it does establish a weak correlation between site contribution and e-mail reminders, perceived site usefulness, whether participants obtain information on decentralization, and home Internet access. Although these correlation coefficients run between .245 and .133, their significance levels are substantially higher than .05 and therefore it is possible that these correlations could also be explained by chance.

The lack of correlation between Internet access and contribution can easily be explained by the distribution method bias, which made it more likely that those with Internet access would respond to the questionnaire.

That there is no connection between propensity to share and use of the website to do so is somewhat surprising. This connection was made previously by Jarvenpaa and Staples (2000) in evaluating use of electronic collaborative media. Whatever the reason, though, most of the participants of this community are sharing decentralization information through some means. Since the goal for this community is to exchange information, ultimately it does not matter if that is happening in
person, over e-mail, over the phone, in article, or by use of the website tool, as long as the information is being exchanged.

Also very surprising is the weak negative correlation between contribution and face to face meetings, and between contribution and how participants found out about the website (which was largely through human interaction of some kind). Again, most of the literature stresses that the physical and virtual worlds reinforce one another, and that trust and identity are built up more in person than in the virtual world.

It is possible that members who meet face to face simply share their information on decentralization in that forum instead of posting it to the website. This hypothesis is somewhat supported by a weak correlation between having face to face meetings and sharing decentralization information at conferences or at work (Pearson's Coefficient of .349, but with a significance level of .055).

9.6 Participant Survey Conclusions

This statistical analysis does demonstrate that there is not one single barrier or obstacle that keeps members of the DDialogue from contributing content on decentralization to the website. Although it is speculative, the non-response from the remaining 90% of the DDialogue population may be the most telling factor. If they did not respond to the questionnaire because they do not have Internet access and did not receive the survey, they also could not participate on the website for the same reasons. Therefore it is possible, but not proven, that one barrier does outweigh others.
Thus the problem of non-participation is complex and has many roots. This is probably best evidenced by the variance of reasons cited by respondents who had not contributed an item to the site. No one reason was cited by more than more than 25% of the respondents who answered that question, and the number of reasons supplied in the write-in portion almost doubled the number of possible reasons why they would not contribute.

10. Suggestions from the Literature

From the results of the participant survey, it is clear that the root causes of non-participation among DDialogue members are multivariate. Thus the solutions to increasing participation and thereby keeping the community active and alive will be equally complex.

Wenger, McDermott and Snyder (2002) use the analogy of plant growth to explaining how a community also needs to be nurtured. (pp. 12-13) Whether a seed is planted intentionally or takes root naturally, in order to grow and flourish it needs the right amount of sun, water, nutrients and protection from harm in the form of pests and weeds. In other words, a community of practice needs more than to be seeded, it needs to be cultivated in order to be successful.

McDermott (2000) identifies ten critical success factors for community building to meet the management, community, technical and personal challenges which present themselves. They are:

1. Focus on topics important to the business and community members
2. Find a well-respected community member to coordinate the community
3. Make sure people have time and encouragement to participate
4. Build on the core values of an organization
5. Get key thought leaders involved
6. Build personal relationships among community members
7. Develop an active passionate core group
8. Create forums for thinking together as well as systems for sharing information
9. Make it easy to contribute and access the community's knowledge and practices
10. Create real dialogue about cutting edge issues

Wenger, et al. (2002) recognize seven principles for cultivating communities of practice:

1. Design for evolution
2. Open a dialogue between inside and outside perspectives
3. Invite different levels or participation
4. Develop both public and private community spaces
5. Focus on value
6. Combine familiarity and excitement
7. Create a rhythm for the community

Myanatt, O'Day, Adler and Ito (1998) investigated network communities in the context of cooperative work and identified five affordances of virtual space which support the success or failure of such communities. These are:

1. Persistence
2. Periodicity (rhythms and patterns)
3. Boundaries (including the boundaries between the real and virtual worlds)
4. Engagement (being able to engage in the community by participating in diverse ways)
5. Authoring

Although these works were generally written from a workplace or organizational perspective, many of the tenets they present are also applicable to non-organizational groups, such as the DDialogue. There is some overlap with two legs of the three-legged stool principle: access (make it easy to contribute and access) and usefulness (focus on value, focus on topics important to the business and community members). However, the third leg, communication, is not aligned with these guidelines. It may be that in an organizational setting, communication about the group is less important because potential members are more or less a captive audience. For the DDialogue, which is more diverse and distributed, communication remains crucial to attract new members who might become active participants and to remind current participants to be involved.

Many of the remaining extensible principles in the literature resonate with the experience of the DDialogue, and these augment the precepts of the three-legged stool theory. These tenets, supported by the findings of some of exploratory studies discussed earlier, have strong implications for how to increase participation on and strengthen the DDialogue. In summary, they are:

1. Reinforce virtual communities with face to face interaction
2. Develop an active core group
3. Designate an active community coordinator
4. Establish a rhythm of interaction

5. Create relationships between people

10.1 Reinforce virtual communities with face to face interaction

This suggestion really appears to be a linchpin, as it appears the most consistently across the literature. The example of The Well as cited in the Pew Internet & American Life Project study (2001) indicates that that group really took on a level of vitality after members met face to face (p. 10). Kimble, et al's (2000) case studies revealed that the trust and identity built up among members in real world meetings "enabled relationships to develop quicker and go further" and provided a "sound basis for subsequent electronic communication." (p.13)

Myanatt, et al's (1998) concept of "engagement" for network communities is consistent with the suggestion that interaction in both the physical and virtual space is necessary. Members should be able to "come together in diverse ways" and "participate in many different kinds of engagements and even many different engagements at the same time." (p. 131)

Ruhleder (2002) evaluated the community in an online degree program for Library and Information Science at the University of Illinois, Urbana-Champaign against the Myanatt, et al's affordances of virtual space. In this program, students interact in a variety of ways, including asynchronous online (anytime, ongoing), synchronous online (scheduled for once a week) and face to face (once each semester). Student comments on face to face interaction divulged that that time was "critical" because it helped students "put faces to all those names," and "definitely important" to aid the students in "creat[ing] real people." (p.15)
In his discussion on his sixth critical success factor for communities, McDermott (2000) suggests "build[ing] energy through community contact" and says that "live contact is key to building a sense of commonality, enthusiasm and trust." The global communities he investigated to draw these conclusions hold face to face meetings one to three times a year, even though these meetings cannot logistically be comprised of all community members.

The notion of combining familiarity and excitement propounded by Wenger, et al. (2002) also touches on this concept. In their discussion, they recommend organizing special types of conferences and workshops to spark spontaneous interaction between community members. (p. 62)

Clearly, there is a great deal of support in the literature for human interactions in the physical world as a key factor in the success in communities of practice. This also extends to communities which are more rooted in the online world.

As an overview document on the community website notes, the organizers of the DDialogue "recognized from the start that [it] is first a network of people, not just an Internet application." (DDialogue, 2001d) Although many roundtables and real world meetings were organized in the more nascent stages, it may be that in order to ensure the success of the community that these need to continue.

Although this suggestion is highly prevalent in the literature, it is contradictory to the weak negative correlation discovered in from the questionnaire between meeting other members of the DDialogue face to face and contributing items to the site. Ultimately, the goal of the DDialogue community is to exchange information. While it
would be nice if some exchange occurred on the website so that new generations of
members could read and learn from them, if members are exchanging information in
person, then the goal of the community is being met. So, although the statistical
finding might argue against recommending that members meet in person, it is still
strongly recommended as it supports the ultimate goal of the community.

However, there are two very serious challenges to this suggestion: funding and
logistics. The official project funding subsided in late 2001, and getting people
together from so many different nations seems unlikely. Local cell meetings would be
more financially feasible and also logistically easier to organize. If the technology and
connectivity is available, teleconferences or meetings are also an option.

**10.2 Develop an active core group**

In every community, there are varying levels of participation. Some members are
fervently active, others participate now and again, and probably the largest cross
section on electronic formats are lurkers, people who read, but do not contribute.
(McDermott, 2000, p. 6)

McDermott (2000) suggests that instead of trying to balance participation out to
every member of the group, an active core group should be intentionally developed.
This serves a dual purpose, in that active members not only contribute information,
but they also come to feel some level of responsibility for developing the community
themselves. (p. 6)

This is also echoed in the third Wenger, et al. (2002) tenet, that different levels of
participation should be invited. It is unrealistic to expect equal participation
throughout a group, because people have varying levels of interest and investment. Frequently spontaneous leadership emerges within a community, and this is usually 10-15% of the whole community. The next level of participation is the active group, another 15-20% of the whole community, who participate frequently, but not as intensely as the core group. The rest of the community members remain peripheral, but are drawn towards the center of activity as something draws their interest. These groupings are normal and welcome. The role of the core group is to "build a fire in the center of the community that will draw people to its heat." (p. 58)

Varying levels of participation are also likely to ensure more continuity through successive generations in a community.

For the DDialogue, this could be an especially useful piece of advice, since there is no more official funding. Core members could invite their colleagues to participate, spark discussions and guide the community through the next stages of growth. In the language of DDialogue, core members are the champions of the community and its content.

10.3 Designate an active community coordinator

Wenger, et al., (2002) report that many studies have discovered that "most important factor in a community’s success is the vitality of its leadership." (p. 80) This is supported by evidence that spontaneous leadership emerges in communities that are not planned or organizationally supported. (McDermott, 2000, p. 5)

An active community coordinator can "'work' the space between ... meetings" by informally communicating with participants to discover what their interests and
needs are and connecting them with appropriate resources. "These 'back channel' discussions actually help orchestrate the public space and are the key to successful meetings." (Wenger, et al., 2002, p. 58)

These coordinators should be well-respected members of the community, but should not be the number one expert in their field. Their job is to connect people and facilitate interactive networks, not to provide answers. (McDermott, 2000, p. 5)

Some of the key functions performed by the coordinator should be (Wenger, et al., 2002, p. 80):

- Identifying significant issues
- Planning and facilitating events
- Linking community members informally
- Fostering development of members

The organization that hosts the Francophone version of the community website was originally identified to play a coordination role for the DDialogue. They did organize early events and identify key stakeholders who were good candidates for participants. However, it is likely that they will need additional support, financial and otherwise, to play this role to fruition.

10.4 Establish a rhythm of interaction

Myanatt, et al., (1998) observed that "successful network communities carry intelligible rhythms of interaction and awareness, which can vary in different communities." (p. 137) Every community must find its own pace. If it is too fast can,
it be overwhelming and discourage participation. If it is too slow, members will forget about the community and not make the time to participate. For the DDialogue, the pace appears to be too slow.

This is confirmed in some of the survey response comments, where respondents indicated that the website content is not updated frequently enough, and that no one participates in the online discussions. This is also borne out by the low number of postings to the site. Long stretches of time will pass before new content is added, followed by a small burst of activity as members are reminded of the site by notifications sent from the original posting. Then the activity dies down again.

This occurs in other situations and groups. An engineering community discussed by Wenger, et al. (2002) typically has a flurry of activity just before and after teleconferences and meetings. A library science community holds an annual meeting, but six months afterwards has no activity on their website. (p. 63)

These researchers suggest having regular rhythms for a community, such as conferences, discussions or meetings. Special projects and events can break up that rhythm so that it is not monotonous, but in such a way that the regular pace endures.

The Hot Topics section of the DDialogue website was designed to be updated with a new topic every three months. In reality, the topics that are currently on the site have been in place for one to two years. If face to face meetings prove to be infeasible for this community, the reestablishment of the rhythm of the Hot Topics may be one way in which the DDialogue may restore some periodicity.
Likewise, an active core group or community coordinators could take it upon themselves to add new content in the slow down stretches between contributions. Their additions could reawaken other participants to the site, and perhaps spark subsequent participation.

10.5 Create relationships between people

All of the preceding tenets found in the literature are intertwined, and they culminate in this last point. As those steps are realized, it will result in the establishment of relationships between the participants of the DDialogue, as was initially hoped by its planners.

Once members develop identity with the group and relationships, they will become the key factor in sustaining the community. They will support the "(re)production of the community through their short-term interactions and long-term engagements." (Mynatt, et al., 1998 p. 152)

11. Conclusions

While there are clear benefits to membership in a community of practice, these benefits do not guarantee participation on the part of a group's members. A case study of one cross-organizational, international online community of practice where contribution of content to the group's website was very infrequent suggested many possible factors which influence participation and non-participation. These are:

- Access to the community (Internet access)
- Communication about the community
- Perceived usefulness and value of the community’s content
- Ease of use of the tools used to exchange information
- Computer Comfort
- Propensity to share information
- Trust
- Time
- Physical world reinforcement of virtual relationships

A questionnaire sent to community members could not provide conclusive correlations between these factors and contributing items to the site, but it did confirm that the factors which influence participation and non-participation are complex and multivariate. Although trust can probably be ruled out as a factor for the questionnaire respondent group, different members participate or do not participate on the website for different reasons.

It is possible that the complexity of the DDialogue content itself may be a barrier to participation on the website. Communities of interest or newsgroups on more straightforward subjects may see higher rates of participation because participation can be as simple as stating an opinion or giving an easy answer. It may be easier, for example, to participate in the programming language newsgroups investigated by McClure Wasko and Faraj (2000) because there are answers. One programmer can ask another the syntax to a function and that syntax can be produced. Decentralization is a much more abstract and complicated topic. Experiences can be shared and procedures recommended, but not in the sometimes simpler terms presented by the topics of other communities.
In any event, the solution to increasing the participation on the DDialogue website and therefore the level of activity of the community of practice is going to be complex. There is not a single magic bullet that will improve the vitality of this community, but there are steps that can be taken.

Among the lessons learned from the experience of building the site were general guidelines that should be followed for any future site implementation. If a discussion forum is part of the site, pick a technology that can be integrated into the site instead of separate from it and make sure it is ready to be released when the rest of the site is ready. If content from multiple languages will be available for the community, place them both on the same website and provide translation tools so users can read both. When the site is released, release it with the permanent address of the community even if the server that is hosting it is not the permanent host. Keep discussion catalysts, such as the Hot Topics fresh and up to date. Simplify interface choices, such as the subscription options to make it easier and friendlier for users.

Suggestions from the literature on how to improve the chances of the DDialogue's success include:

- Reinforce virtual communities with face to face interaction
- Develop an active core group
- Designate an active community coordinator
- Establish a rhythm of interaction
- Create relationships between people

There are many possible solutions to the problem of non-participation that might increase this vitality of this and other communities of practice. Some of these steps
can be taken by community developers at the creation of the community. Ultimately, however, the success of the community is incumbent upon its members. If they find membership in the group to be of value, they will work to introduce others to it and make it active.
Bibliography


Appendix A: Homepage Screenshot

Dialogue on Democratic Decentralization

Welcome to the Dialogue on Democratic Decentralization, a network of people committed to:

- Increasing the exchange of useful decentralization information and perspectives between local and central level peers, within and across sectors, within participating countries, and across regions of Africa
- Strengthening local government effectiveness, particularly in the area of public finance, local revenue generation, and public-private partnerships
- Increasing local engagement in decentralization policy development

Recent News
- 30 Oct 2002: Practitioner Case Studies Project
- 14 Oct 2002: Training for Local Councils and Civil Society Leaders in Financial Management and Transparency
- 10 Oct 2002: RTI training program to build capacity of the Association of Municipalities of Mali
- 10 Oct 2002: New work on decentralization in West Africa

Hot Topic
- Decentralization and Women
- View the Hot Topic

Ghana Joins DDialogue at 29 January Decentralization Roundtable

Funded by the United States Government for Development and Democracy Initiative.
If you encounter technical problems, contact DDialogue.
Appendix B: Questionnaire (English)

1. How many times have you visited the site in the last year?

2. How useful is the content available on the site?
   a) Very useful
   b) Somewhat useful
   c) Not useful
   d) Don't Know

3. How did you become familiar with the site?
   a) Kick-off conference
   b) T-shirt
   c) Business card
   d) Presentation at EDDI conference
   e) Ribbon cutting
   f) Colleague who is a registered member

4. Have you received any e-mail reminders about the site?
   a) Yes
   b) No
   c) Don't Know

5. Have you contributed an item to the site?
   a) Yes
   b) No
   c) Don't Know

   If yes:
   5a. How easy is it to contribute an item to the site?
      a) Very easy
      b) Somewhat easy
      c) Somewhat difficult
      d) Very difficult

   5b. Have you contributed an item when you were not at a kick-off conference?
      a) Yes
      b) No
      c) Don't Know

   If no:
   5c. Which of the following statements best expresses the reason you have not contributed an item to the site?:
      a) I forgot about the website
      b) I cannot get to the website
      c) The website is too slow
      d) I do not have any information to add to the site
      e) I do not have time to add information to the site
      f) I do not want others to steal my ideas
      g) Other, please specify:
6. Do you have face-to-face meetings with other registered participants of this website?
   a) Yes
   b) No
   c) Don't Know

7. Do you have internet access where you work?
   a) Yes
   b) No

   If no, please go to question 8.
   If yes:

7a. On average, how many times a day do you use your internet connection to send e-mail?
   a) 0
   b) 1 - 5
   c) 6 - 10
   d) 10 - 20
   e) more than 20

7b. On average, how many times a day do you use your internet connection to visit web sites?
   a) 0
   b) 1 - 5
   c) 6 - 10
   d) 10 - 20
   e) more than 20

7c. How fast is your work internet connection?
   a) Very fast
   b) Fast
   c) Average
   d) Slow
   e) Very Slow

7d. What is your connection type?
   a) Modem
   b) Dial up
   c) Cable Mode
   d) DSL or ADSL
   e) VSAT
   f) T1
   g) Don't know

8. Do you have internet access at home?
   a) Yes
   b) No

   If no, please go to question 9.
If yes:

8a. How fast is your home internet connection?
   a) Very fast
   b) Fast
   c) Average
   d) Slow
   e) Very Slow

8b. What is your home connection type?
   a) Modem
   b) Dial up
   c) Cable Mode
   d) DSL or ADSL
   e) VSAT
   f) T1
   g) Don't know

9. How comfortable are you using a computer?
   a) very comfortable
   b) somewhat comfortable
   c) not comfortable
   d) very uncomfortable

10. Where do you share information with others about decentralization issues?
    a) Conferences
    b) At work
    c) Via e-mail
    d) Publishing articles
    e) Over the telephone
    f) Via letters
    g) I do not share information with others about decentralization issues

11. Where do you obtain information from others about decentralization issues?
    a) Conferences
    b) At work
    c) Via e-mail
    d) Published articles
    e) Over the telephone
    f) Via letters
    g) I do not obtain information from others about decentralization issues

12. Do you actively participate in other online websites?
    a) Yes
    b) No
    c) Don't Know

13. Do you actively participate in any e-mail lists?
    a) Yes
    b) No
    c) Don't Know

14. What country do you live in?
15. What is your gender?
   a) Female
   b) Male

16. What is your age range?
   a) Under 20
   b) 20 - 30
   c) 30 - 40
   d) 40 - 50
   e) 50 - 60
   f) Over 60
Appendix C: Questionnaire (French)

1. Combien de fois vous êtes-vous rendu sur le site l’année dernière?

2. Comment avez-vous trouvé le contenu du site?
   a) très utile
   b) assez utile
   c) inutile
   d) je ne sais pas

3. Comment vous êtes-vous familiarisé avec le site?
   a) Conférence de lancement
   b) T-shirt
   c) Carte de visite
   d) Présentation à la conférence EDDI
   e) Cérémonie d’ouverture
   f) Collègue qui est membre

4. Avez-vous reçu des courriers électroniques à propos du site?
   a) oui
   b) non
   c) Je ne sais pas

5. Avez-vous contribué des éléments au site?
   a) oui
   b) non
   c) je ne sais pas

   si OUI:
   5a. est-il facile de contribuer des éléments au site?
      a) très facile
      b) assez facile
      c) assez difficile
      d) très difficile

   5b. Avez-vous contribué un élément alors que vous n'étiez pas à une conférence de lancement?
      a) oui
      b) non
      c) Je ne sais pas

   Si NON:
   5c. Quelle phrase représente le mieux la raison pour laquelle vous n’avez rien contribué au site?
      a) j’ai oublié que le site existait
      b) Je n’ai pas accès au site
      c) Le site est trop lent
      d) Je n’ai pas d’information à rajouter au site
      e) Je n’ai pas le temps de rajouter des informations sur le site
      f) Je ne voudrais pas que d’autres me volent mes idées
      g) Autre raison, veuillez spécifier:
6. Avez-vous des réunions en personne avec d’autres participants inscrits au site?
   a) oui
   b) Non
   c) Je ne sais pas

7. Avez-vous accès à l’internet sur votre lieu de travail?
   a) oui
   b) non

Si NON, veuillez vous rendre à la question 8.
Si OUI:
7a. en moyenne, combien de fois par jour utilisez-vous l’internet pour envoyer des courriers électroniques?
   a) 0
   b) 1-5
   c) 6-10
   d) 10-20
   e) plus de 20

7b. En moyenne, combien de fois par jour utilisez-vous l’internet pour visiter des sites?
   a) 0
   b) 1-5
   c) 6-10
   d) 10-20
   e) plus de 20

7c. Quelle est la rapidité de votre connexion à l’internet?
   a) Très rapide
   b) Rapide
   c) Moyenne
   d) Lente
   e) Très lente

7d. Quel type de connexion avez-vous?
   a) modem
   b) téléphone
   c) cable
   d) DSL ou ADSL
   e) VSAT
   f) T1
   g) Je ne sais pas

8. Avez-vous accès à l’internet à votre domicile?
   a) Oui
   b) Non

Si NON, veuillez vous rendre à la question 9.
Si **OUI**:  
8a. Quelle est la rapidité de votre connexion à l’internet à votre domicile?  
   a) très rapide  
   b) rapide  
   c) moyenne  
   d) lente  
   e) très lente  

8b. Quel type de connexion avez-vous à votre domicile?  
   a) Modem  
   b) Téléphone  
   c) Cable  
   d) DSL ou ADSL  
   e) VSAT  
   f) T1  
   g) Je ne sais pas  

9. Etes-vous habitué à utiliser un ordinateur?  
   a) très habitué  
   b) assez habitué  
   c) pas habitué  
   d) pas habitué du tout  

10. Où partagez-vous des informations sur les questions de décentralisation avec d’autres personnes?  
   a) Conférences  
   b) Au travail  
   c) Par email  
   d) En publiant des articles  
   e) Par téléphone  
   f) Par lettres  
   g) Je ne partage pas d’informations avec d’autres personnes sur les questions de décentralisation  

11. Où obtenez-vous des informations sur les questions de décentralisation?  
   a) Conférences  
   b) Au travail  
   c) Par email  
   d) Articles publiés  
   e) Par téléphone  
   f) Par lettres  
   g) Je n’obtiens pas d’information d’autres personnes sur les questions de la décentralisation  

12. Participez-vous activement à d’autres sites web?  
   a) Oui  
   b) Non  
   c) Je ne sais pas  

13. Participez-vous activement à des listes de courriers électroniques ?  
   a) Oui  
   b) Non  
   c) Je ne sais pas
14. Dans quel pays habitez-vous?

15. De quel sexe êtes-vous?
   a) Féminin
   b) Masculin

16. Quel âge avez-vous?
   a) moins de 20 ans
   b) 20-30 ans
   c) 30-40 ans
   d) 40-50 ans
   e) 50-60 ans
   f) plus de 60 ans