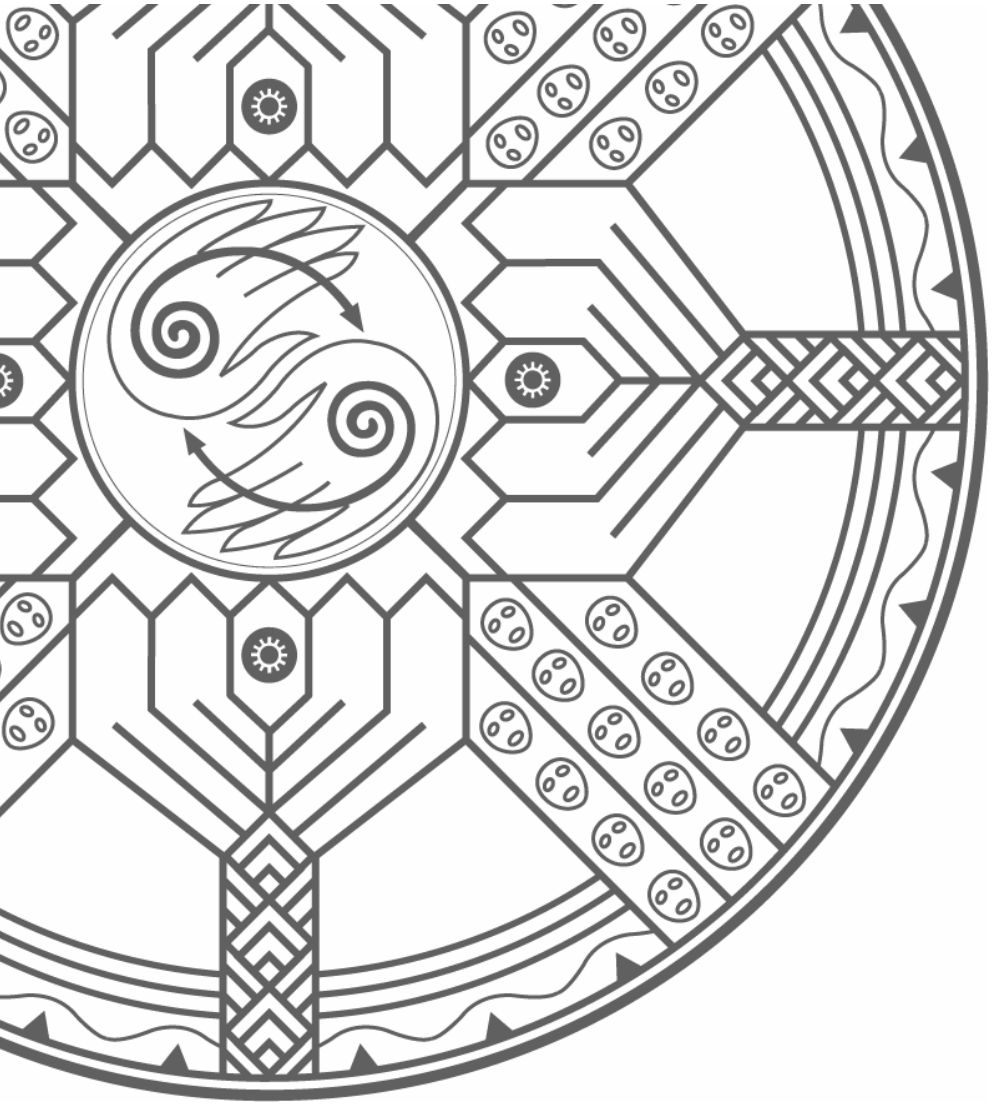

# Communicating Sustainable Development on the Web

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iisd International Institute for Sustainable Development / Institut international du développement durable

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

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Published by the International Institute for Sustainable Development



Printed in Canada

Copies are available from IISD.

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# 1 Introduction

Excellent external communications practices are essential if an organization is to achieve success in helping decision-makers in government, local authorities and industry to develop and adopt policies and practices that are supportive of sustainable development.

Communications strategies must take today's tools and technologies into account. There needs to be a shared understanding of how the Web and other electronic media may complement or replace existing communications media. While the Web may be a cost-effective way of distributing print publications, it is most effective when it's used to do new things that could not be done previously:[1]

- engage in conversations with target audiences;
- allow users to access information in a non-linear manner;
- support searching and multiple views;
- be free of charge; and
- ignore geography.

Any communications strategy that includes Web communications must embrace two fundamental ideas:[2]

1. **Your organization is not separate from its Web site.** Your Web site is not a project. It is an extension of your organization, a projection into cyberspace. It is also a gateway through which your customers, suppliers, partners and other audiences will interact with you.
2. **Think "Web first."** Your Web site should be a *primary* system for information delivery. Whenever your organization has something to say, it should address the Web before it producing press releases, brochures, ads, manuals, printed reports, executive speeches or direct-mail pieces.

With those assumptions in mind, key issues facing organizations include the following:

- How can the information be easier to find and access?
- How can the Web site be more than just a passive repository of publications and "brochureware"?
- How can the Web site promote more effective communication with collaborating institutions and facilitate their participation in work?

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[1] Jakob Nielsen. "Better than reality: A fundamental Internet principle." *Alertbox*. http://www.useit.com/alertbox/980308.html (March 8, 1998).
[2] Amy Gahran. "Becoming one with your site." *Content Spotlight.* http://www.content-exchange.com/cx/html/newsletter/1-9/vt1-9.htm (August 9, 1999).

- What human and financial resources does the organization want to commit to its Web products and services? Which of these resources should be internal and which should be outsourced?
- How can an organization work within the frameworks being developed within broader initiatives and alliances that may have an impact on Web activities?

This paper will explore how the member organizations within knowledge networks approach the Web.

## 2 Definitions

Discussions about the Web can quickly become confusing given the lack of a common vocabulary to discuss the components of an organization or network's online presence. Most people are familiar with books composed of paragraphs, pages, chapters and sections. We also know that musical scores have notes that, together, form phrases and stanzas. But most people are generally unfamiliar with the corresponding ideas for Web sites. Within the Sustainable Development Communications Network (SDCN), we are slowly building our own vocabulary to enable us to talk about our work and to more effectively collaborate on joint Web products and services. The emerging vocabulary includes such ideas as files, clusters, modules, sections, Web sites and Web space. These concepts are illustrated below using examples of content developed by Development Alternatives, a large civil society organization based in New Delhi, India.

**A file is the most basic unit of online content.** It corresponds to the idea of a page in a book. However, unlike with books, online "pages" can be of any length. A file may be one paragraph long or it may contain the full text of an entire book. The file may be in many formats as well—text, text with graphics, a video clip, an audio file, animation, or a document in Portable Document Format (PDF), Word, Excel and PowerPoint. A file may be static and unchanging or it may be dynamically generated from a database to match parameters set by the user. An example of a file is http://www.devalt.org/da/isb/comm/CATALOGS/green1.htm. This file describes Episodes 5–9 of Development Alternative's Green Show weekly environment and business magazine distributed by three satellite channels in India.

**A cluster is a collection of closely-related files**. Navigation is usually quite tight within a cluster, making it easy for a user to quickly access related files. They may take the form of databases of organizations and events, or publications that have been rewritten for online presentation. They may also provide support and information on a particular conference or an online discussion forum. All nine files related to the Green Show would constitute a cluster. The homepage for the cluster can be found at http://www.devalt.org/da/isb/comm/CATALOGS/green.htm.

**A module is action-focused and may be made up of several clusters of content**. Modules exist to help users do something. That action may range from locating resources for a paper to donating funds or contacting a government representative to voice their opinion. Not all modules must be created and maintained by a single organization. They

may even be archived or moved to the Web site of another organization if funding is no longer available. The alternative film guide created by Development Alternatives serves the needs of NGOs, educational institutions and other groups in India who wish to obtain films on pioneering work and experiments that organizations around the world have carried out to face the environmental challenge. It is comprised of 11 clusters including the Green Shows. The module home page is http://www.devalt.org/da/isb/comm/CATALOGS/catalog.htm.

**Modules are often grouped into sections of a site in order to facilitate their maintenance as well as to assist users to locate more broadly related content**. Sections are frequently related to the institutional structure of an organization. While it may not be the most intuitive structure for users, it can build feelings of content ownership among staff and significantly increase the possibility the content is maintained and updated. The communications section of the Development Alternatives site can be accessed at http://www.devalt.org/da/isb/comm/index.htm. It includes not only the film catalogue module, but also the newsletter module and several general files outlining the goals of DA's Communications Unit. Depending on the size of the site, there may be several layers of sections within it. For example, the communications section of DA's site (homepage at http://www.devalt.org/da/isb/index.htm) is part of a broader Institutional Systems Branch section. This section also includes content on training, small institution support and the Development Alternatives Information Network.

**A Web site is a discrete unit of content that usually shares the same domain name, management policies and certain critical navigational elements**. A Web site may be that of a network (e.g., http://sdgateway.net/), an organization (e.g. http://www.devalt.org/) or related to a particular project (e.g. http://www.cleanindia.org/). Many project Web sites begin their existence as modules within another site. They are spun off and establish their own presence once they have reached a critical mass of users and attract enough resources to ensure their maintenance. Also, network or project Web sites may "belong" to multiple organizations. Frequently this type of site has sections: a public section with information about the initiative and its results; and a private working section that enables project participants to upload information and participate in closed forums. Portals and gateway sites specialize in offering easy access to content on multiple sites. The most successful portals focus on meeting the information needs of particular niche users (e.g., maternal health care providers in South Africa; Central American agroforesters).

**Web space refers to the collective presence of an organization's content on the Web.** With the growth of news sites, alliances and online e-mail archives, our Web spaces may be much larger than our own Web site(s). For example, the Web space of Development Alternatives includes not only its main organizational Web site http://www.devalt.org/, but also:

- the Development Alternatives Information Network <http://www.dainet.org>;
- its community site <http://www.tarahaat.com>;
- a project site on youth initiatives <http://www.cleanindia.org>;

- portions of the SD Gateway, including the module on the Search for Sustainable livelihoods <http://sdgateway.net/livelihoods/>;
- reports on the Earth Council site prepared by Development Alternatives for Rio+5 <http://www.ecouncil.ac.cr/rio/focus/report/english/people.htm>; and
- a case study about Tarahaat on the Digital Dividends site <http://www.digitaldividend.org/case_study_exp_temp.asp?name=29>.

To be effective on the Web, Development Alternatives must establish and maintain an overall strategy for how these sites, modules and articles will further its mission and vision.

Throughout this paper, the term "Web products and services" is used to describe online modules, sections and/or sites. We use the term to emphasize that every product implies a corresponding new service to users. It raises their expectations that they will be able to interact with the creators and take actions that were previously unimagined. **Every Web product and service must have one staff member who is the primary contact person responsible for the management of the product or service**. This person must be intimately familiar with the content of that product. In addition to these staff, however, larger organizations should also designate a Web content manager who maintains an overall vision of its Web space and ensure linkages between its constituent parts.

## 3 Integrate the Web into communications strategies

The Web is not a technical challenge to be solved, but a communications medium to be utilized. It is one element of broader communications strategies. The organizations best positioned to take advantage of the capabilities of the Web are those that have:

- a clear mission and objectives;
- a basic communications strategy;
- staff trained in communications or journalism;
- experience with developing print publications ranging from press releases and newsletters to working papers and books;
- clearly defined publishing procedures understood and accepted by all staff;
- clearly defined responsibilities for planning, executing and marketing print or video products; and
- clearly defined procedures for responding to phone, fax and e-mail inquiries and requests.

The skills and procedures developed through working with other communications media are transferable to Web communications. It is much easier to integrate the Web into an existing publishing culture than it is to try to develop both at the same time. Frequently, however, the creation of a Web site sparks the development of a broader communications strategy. The level of standardization and institutional rigour required by the Web may lead to the professionalization of all communications work undertaken by an organization.

### *3.1 Establish clear goals*

Many organizations give little thought to why they want to create a particular Web product or service. It is just something they feel they need to have. If goals exist, especially for institutional Web sites, they may not be articulated. Each person in the organization may have their own perspective, which they assume is obvious and shared by all. This often results in conflicts later in the development of the Web product or service.

Make no mistake—Web products and services are political. A basic organizational Web site is a virtual model of your organization. Like all models, it reveals assumptions and relationships among constituent elements. It becomes the focus of emotions and conversations which people are often not able to articulate about the organization itself. In this way, Web sites often precede and serve as a catalyst for institutional reorganization. Understanding this, it becomes clear that the goals for an institutional Web site must be the same as for the organization as a whole. Some goals will be self-serving (e.g., to increase an image of respectability and transparency for funders); others will be directly related to changing sustainable development policy and practice (e.g., to reduce the frequency of perverse subsidies).

Given the complex jigsaw puzzle of an organization's Web space, goals must be established for each product or service. The deeper the level of content (i.e. cluster and module), the more specific the goal will need to be. Higher agglomerations of content will have more general goals.

### *3.2 Assess your resources*

Goals must be realistic in order to be useful. It is not particularly helpful to state that a module aims to transform international climate change policy unless the organization(s) involved has the resources to undertake such a task. Most organizations new to the Web spend a considerable amount of time assessing and acquiring the technical resources necessary to establish a Web presence. They ensure that they have access to a Web server and software for the creation and uploading of files. They also seek to secure the services of an individual or corporation with coding and graphic design experience able to create Web files. Often, they forget to spend equal time assessing the resources necessary to undertake all stages of work including research, writing, graphic design, marketing and responding to inquiries.

Given the lack of such a preliminary assessment, many organizations begin to feel a resource pinch when they try to add the Web into their existing mix of communications activities. People will tend to return to the "tried and true" communications products with which they are familiar. A more sustainable approach is to reassess and restructure existing communications activities in light of the new Web products and services. For example, the text written to announce a new publication can be written in such a way that it can be e-mailed as a marketing message, included on the publication's back cover as a description, and included in an online publications catalogue. Multi-purposing text is a great way to economize; however, it is only successful when planned for in advance. It is

extremely difficult to establish the correct tone and style for any text unless all possible purposes are considered.

### 3.2.1 Training

A commitment must be made to investing in continuous staff training and support, not only for communications staff, but also for all program staff. This cannot be seen as a one-time effort because:

- Internet technologies keep changing;
- understanding of best practice on the Web is evolving rapidly; and
- there is often high turnover of technical and Web-savvy staff due to the competitive employment market.

In particular, an organization should provide training on the following topics for all program staff developing and maintaining Web content:

- information architecture;
- writing for the Web; and
- moderating forums and discussion groups.

In addition, organizations may wish to conduct training for researchers on the following topics to sensitize them to the multiple skill sets necessary to create online products and services:

- basic HTML and working with templates;
- basic principles of navigation and layout; and
- introduction to databases and advanced Web features/programming.

This will enable them to work more effectively as members of a broader team.

### 3.2.2 Social capital

Another primary resource is the social capital within and between institutions. Social capital refers to the underlying relationships that facilitate (or hinder) collective action. Organizations that are highly fragmented or that have recently undergone restructuring will find that their internal social capital reserves are often quite low. People may not know each other well and may have very different goals. Additionally, organizations that rely primarily on contract and short-term staff may suffer from low internal social capital. Contract staff may be given responsibility for creating or maintaining Web content, but frequently lack the understanding of how their products impacts on other Web products and services within the organization's Web space. This will constrain their ability to create well integrated or cross-cutting products and services.

On the other hand, high levels of social capital and strong relationships are closely correlated with an institution's ability to create high-quality Web products on time and within budget. In addition to resources within an organization, external partners often have **skills and expertise which can be drawn upon.** Individuals from **collaborating**

**organizations and short-term contractors, if well-managed, are valuable resources** which can be drawn upon for the creation of content for online products and services. One of the primary benefits of participation in knowledge networks is the ability of the network to increase the social capital between organizations through regular interactions and sharing of learnings so that they are better able to share resources and undertake collaborative projects.

### *3.3 Get to know your online audience*

The Web is a highly competitive medium. If users do not easily find the information they need on your site, they will go elsewhere and likely not return**.** In order to achieve your goals online, you have to know your users as well or better than you know your own organization. Getting to know your users is a surprisingly resource-intensive task that must be done on a continuous basis. **Users' needs and desires change over time as the state of knowledge on subject matter advances and as competing Web sites arise**. In addition, the rapid growth in Internet access in developing countries will change the online landscape over the next three years and into the future.

If you've had an existing suite of Web products and services for a number of years, you have an existing audience. There are a number of approaches that you should use in that situation to keep in touch with the users:

- **Perform usability testing.** The best way to learn how your users use your sites is to watch them. Usability tests will allow for the identification of exemplary and well-managed sections that are of particular value to users. This knowledge can be used to align site goals and users' needs. Usability testing can also provide evidence of shortcomings and reveal usage patterns that might not be envisioned by a site creator.
- **Analyzing site server logs**. Visitor statistics can be helpful in determining basic information about your sites' users. Unfortunately, they are difficult and time-consuming to analyze well. The explosion of Web search engines and proxy servers make it difficult to identify real users. Unless properly filtered and interpreted, statistics can give an organization a very false sense of success.
- **Online feedback mechanisms and e-mail surveys**. While site statistics can tell you what users have found, only user surveys can tell you what people were looking for and what they have *not* found. While survey response rates are often low, they can be increased through periodic prize give-aways (books, t-shirts, posters and so on.)
- **Conversations with your users**.[3] No structured mechanism can replace one-on-one conversations. These can be initiated by following up with users who have submitted feedback to your site. Conferences and workshops are also excellent places to meet your users and to learn how they use your sites.

These issues are covered in greater detail in the IISD working paper on *Tools for Assessing Web Site Usage*.

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[3] Nick Usborne. "It's the audience, Stupid!" *Contentious*. http://www.contentious.com/articles/1-8/guest1-8b.html (November 17, 1998).

# 4 Structure content according to users' needs

Information architecture is the art of constructing a blueprint for your site before beginning the actual construction. It includes consideration of such elements as:[4]

- content and functionality;
- accommodating growth and change over time; and
- navigation, labelling and searching systems

These elements are what unify a site and allow for a smooth evolution. Well-planned architectures benefit site consumers and producers. According to Rosenfeld and Morville:[5]

> *Accessing a site for the first time, consumers can quickly understand it effortlessly. They can quickly find the information they need, thereby reducing the time (and costs) wasted on both finding the information and not finding information. Producers of Web sites... benefit because they know where and how to place new content without disrupting the existing content and site structure. Perhaps, most importantly, producers can use an information architecture to greatly minimize the politics that come to the fore during the development of a Web site.*

By addressing these issues before undertaking further design revisions, an organization will save itself and its audiences added costs in the future. Web staff and their supervisors need to get to know their content and develop navigational structures and tools that will help users to move smoothly through this content. General usability studies show that **more than half of all users are search-dominant**, about a fifth of the users are link-dominant and the rest exhibit mixed behaviour.[6] Therefore, you must build structures to support both searching and browsing.

## *4.1 Get to know your content*

Web content can be in any format, from any source. However, the standard content of sustainable development sites tends to fall into a number of general categories. It is necessary to understand the differences in these content types in order to select an appropriate information architecture that will assist users to easily locate the content of interest to them. Different content types will also require different guidelines for their management and design.

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[4] Louis Rosenfeld and Peter Morville. *Information Architecture for the World Wide Web*, (Sebastopol, CA: O'Reilly & Associates, Inc., 1998), p. 11.
[5] Ibid, p. 12.
[6] Jakob Nielsen. "Search and you may find." *Alertbox*. http://www.useit.com/alertbox/9707b.html (July 15, 1997)

### 4.1.1 Institutional content

Institutional content includes the vision, mission and goals of the organization and its various sub-units as well as contact information. It also covers current activity reports and work in progress. These latter pieces of information are very valuable to users, but not usually documented. This information does not change rapidly and is updated infrequently. Some examples of institutional content include:

- a description of scenario building activities with young leaders undertaken by the Fundación Futuro Latinoamericano <http://www.fulano.org/Escenarios%20Futuros.htm>; and
- staff photos from EcoNews Africa <http://www.econewsafrica.org/pictures/econews_staff.html>.

### 4.1.2 Newsletters

Most organizations have established print newsletters that are periodically mailed out to interested individuals and collaborating institutions. Most newsletter articles highlight progress on particular projects throughout the previous period. Others explain how changes or new developments within other organizations affect the topic of interest. Newsletters are usually among the first types of content that an organization makes available on the Web. Some examples of newsletters include:

- Development Alternatives' monthly newsletter <http://www.devalt.org/newsletter/main.htm>; and the
- Stockholm Environment Institute's newsletter on Renewable Energy for Development <http://www.sei.se/red/redindex.html>.

### 4.1.3 Publications

Publications include all official meeting and seminar reports, research publications, training manuals and workbooks. They form the core knowledge of an organization and are in demand by the target audiences. Many of these publications are available in some form on the Web, e.g., abstracts, tables of contents or full-text. Non-profit sustainable development organizations are often hesitant to make this content available online out of fear that hard copy sales will decrease and reduce a revenue source. However, organizations are increasingly discovering that giving away publications online may increase print sales and increase partnership and funding opportunities. Some examples of online publications include:

- a publication on the "Seminario Emergencia Pesquera" by the Fundacion Ambiente y Recursos Naturales <http://www.farn.org.ar/docs/p15/index.html>; and the
- a PDF version of "Good Practices in Policies and Measures for Climate Change Mitigation: A Central and Eastern European Perspective" by the Regional Environment Centre for Central and Eastern Europe <http://www.rec.org/REC/Publications/ClimateChangeGoodPractices/GoodPractices.pdf>.

### 4.1.4 Press releases and speeches

Some larger sustainable development organizations and many government offices compose regular press releases alerting the media of new initiatives, reports and collaborative activities. They may also release transcripts of speeches from senior officials within the organization. Online archives of press releases and speeches often function as a "what's new" section. Other times, they contain information not posted elsewhere on the site. Some examples include:

- Maurice Strong's speech at the City of Osaka Environment Symposium <http://www.ecouncil.ac.cr/about/speech/strong/osaka.htm>; and a
- press release on Canada and the U.S. giving formal support to the International Institute for Sustainable Development bid for intervener status in a NAFTA trade law case <http://www.iisd.org/media/2000/nov_22_2000.asp>.

### 4.1.5 Forums

Forums allow for simple interactivity between the users and creators of Web products and services. In essence, all visitors become co-creators. Forums serve three primary functions: to allow the site creators and managers to get to know users better, to allow site users to get to know each other better and to economize on resources by having site users develop some of the content. Forums may take several forms including guest books, bulletin boards and integrated Web/e-mail discussion groups. Some examples of online forums include:

- The Earth Forum <http://www.earthforum.org/>; and
- the Sen Discussion List regarding a framework for analysing poverty and inequality <http://www.iisd.org/economics/pov_sd/senlistserv.asp>.

### 4.1.6 Multimedia

Multimedia includes audio, video and animated content. To date, multimedia has been used sparingly on sustainable development sites given the larger bandwidth necessary to download these files and the increased resources needed to produce them. Audio and video content can be quite useful, however, for illustrating the realities of local sustainable development efforts. They make the efforts and people involved more real than is frequently possible through text. In addition, they bypass requirements of literacy that lock many people out of being able to create or use text-based Web content. Animated content is proving useful for illustrating complex theories and interactions. Some examples of multimedia content include:

- RealAudio Message from Kofi Annan to the delegates at COP-6 <http://iisd.ca:8080/ramgen/linkages/climate/cop6/1annan.rm>; and
- part one of a video of Senegalese women performing a skit on alternative local currencies <http://iisd.ca:8080/ramgen/livelihoods/femmes_doole1.rm>.

### 4.1.7 Databases

Databases allow for easier content management by creators and improved interactivity for users. Directories of sustainable development staff, experts, organizations, publications, jobs and events abound on the Web. By maintaining the information in databases, creators can easily update records to reflect changes and additions. Databases also allow users to search and retrieve only the information of most interest to them. More advanced applications of databases integrate the use of cookies to allow users to register preferences; the database then customizes the Web interface to meet these interests. Some examples of databases include:

- Directory of National Councils for Sustainable Development – Asia and the Pacific Region <http://www.ecouncil.ac.cr/Template/Foxdb/ncsddbm/ncsd_asia_ec.cfm>; and
- Ecologies directory of environmental laws from Central and Eastern Europe <http://www.rec.org/REC/Databases/EcoLegis/default.html>.

## *4.2 Support searching for content*

Whether your site(s) currently has its own search engine, a large proportion of users will arrive deep within the site courtesy of one of the many commercial search engines indexing the Web. Therefore, you must ensure that search engines properly index the content in order to help your target audiences to find your materials.

The addition of meta-tags to all files will attract more qualified users from some search engines by providing better indexing and file descriptions to those services' users. However, each search engine uses meta-tags differently. For example, while AltaVista uses meta-tags to rank the relevance of documents and in displaying information about a file, Google does not use meta-tags to determine relevancy and uses only the first 100 characters of the description tag in its display. If the organization chooses to provide detailed meta-tags, content area experts should provide the information for all Web resources. This will require commitment of a suitable number of staff to add the information or supply the information for others to add.

In addition, as soon as it is feasibly possible, an organization should add a search mechanism to its site(s). A link to the search engine should be on every page. Search interfaces are one of the most important elements of any site (or suite of sites) with more than 200 pages of content. You should look for a search mechanism that can:

- index all the sites' content completely, including format types such as Rich Text Format, Portable Document Format and Microsoft formats; and
- be capable of limiting the scope of a search to certain sites or areas within sites.

In addition, if you are considering creating a knowledge network gateway, you should invest in a search mechanism that is capable of having a distributed catalogue (the index that results from the search engines work). This will enable you to integrate the search results from all of the network members' Web sites.

If you do not have the resources to purchase, set up, and maintain your own search engine, it is often possible to make use of the services of existing online search engines. For example, you can help your users to find your content on the AltaVista search by restricting AltaVista's scope to your particular Web host name.[7] For example, if the International Institute for Sustainable Development did not have its own search engine, we could link to http://www.altavista.com/cgi-bin/query?q=%2Bhost%3Aiisd.ca&kl=XX&pg=q&Translate=on and provide our site users with instructions to add their search term to the preset search box. This would restrict their search to the domain http://www.iisd.org .

### *4.3 Organize content for browsability*

Users who get to a page through a search mechanism still need structure to understand the nature of the page relative to the rest of the site.[8] The key to assisting users to browse through content is a modular structure with links between pertinent content and a clear sense of context. Context can be built through the use of short linking texts that explain why and how certain clusters of content or modules are related. They then provide links to these deeper areas of related content. In a well-organized site, a link to the homepage of the next level of content above where one is should be sufficient to help users find related content.

Additional context can be built into a Web product or service by using a Yahoo-style navigation bar that shows the full position of the current file. For example, the SD Gateway contains a navigation bar that shows a user's full position within the site. For example, files within the SD Job Bank <http://sdgateway.net/jobs/viewjobs.asp?daterange=14> all have a consistent navigation bar with the following "Home > SD Directories > Jobs." A user can click on any level above their current position and immediately jump to a file that describes what products or services are available at that level.

A central site index or site map should be provided to assist users if they become lost. A site index is organized alphabetically according to keywords familiar to the users. A site map is organized according to the structure of the site and reflects the most important clusters, modules and sections. While it may be helpful to users to have both a site index and site map, most organizations find it challenging to maintain both. The determination as to which is more useful for users often depends on the size of the site and the complexity of the issues. For example, IISD has chosen to create a site index for its main organizational Web site, IISDnet <http://www.iisd.org/siteindex.htm>. This choice reflects the size of the site and the desire to allow users to find old content that is buried within a site structure emphasizing the institute's new initiatives. Alternately, IISD has chosen to create a site map for the SD Gateway <http://sdgateway.net/siteindex.htm>. The site map shows the larger picture of how the site's content is structured. This is possible given the clear, relatively fixed structure of the site.

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[7] AltaVista. "Your Own Search Engine." http://doc.altavista.com/adv_search/ast_haw_ownse.html (July 19, 2001)
[8] Ibid.

## 5 Clarify the management of Web products and services

How you manage your Web sites is intrinsically linked to how you manage your organization; indeed they are essentially one and the same tasks. As Amy Gahran, editor and founder of *Contentious* zine explains:[9]

> *A Web site can communicate effectively with the world outside your organization only if there is good communication and coordination within your organization. However, few organizations excel in those areas. This is why so many organizational sites, especially corporate sites, are flat "brochureware" rather than living, moving representations of (and gateways to) the organization itself.*

**Managing a Web site is ultimately about managing people and relationships**. It is about helping to bring together a team of individuals to support the ability of staff to communicate their ideas effectively in a new communications medium. This can be extremely challenging for many organizations in which staff are predominantly used to working on projects individually. However, as Web communications has advanced over the past five years, skill sets have become increasingly specialized. The days in which a single Webmaster can do graphic design, information architecture and writing as well as maintain the computer network are over. Web work is teamwork with all of the joys and difficulties implied therein. **The development team for any project with an online component will most likely include a number of individuals—depending on the mix of skill sets needed.** Some of these roles may be filled by program staff who understand the content. Others require the talents of general support staff or the expertise of technical personnel.

To minimize duplicated efforts and to ensure easy communication of procedures for developing online content, **the stages of Web development should mirror print production processes as closely as possible**. This does not imply that a lack of clearly-defined procedures for creating print products should be taken as licence for the *ad hoc* management of Web products and service. On the contrary, many organizations have found that the process of improving their ability to manage the delivery of content on the Web has had spin-off effects on improving their print production processes.

Web managers will need to think about how these elements fit together into a coherent production process,[10] accepting that reality does not always follow the best-laid plans and processes. The following comments are necessarily general and highlight primarily what types of staff might be responsible for which steps of product development.

Special consideration must be given to the fact that no Web site is ever complete. Changes and updates are required regularly. Web development continues past the

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[9] Amy Gahran, "Becoming one with your site," *Content Spotlight.* http://www.content-exchange.com/cx/html/newsletter/1-9/vt1-9.htm (August 9, 1999).

[10] One example of an ideal electronic product development process is outlined by Nathan Shedroff in "The Interactive Development Process," http://www.nathan.com/thoughts/process/index.html (July 19, 2001)

conclusion of actual project work. **It is extremely important that each unit have someone able to check portions of their sites on a *weekly* basis for broken links and coding errors. In addition, if staff wish to update information on the sites, they must have a clear process for making revisions.**

## *5.1 Content development tasks*

Content development should be the primary concern of program staff working on Web development.

### 5.1.1 Planning and managing

Within most organizations, planning and managing the delivery of Web content is one of the most overlooked and under-budgeted steps of the entire process. While it is desirable to brainstorm and to plan for online content with the entire production team, there must be one or two individuals responsible for managing each online product or service. Often a team of two individuals—one from the activity area with in-depth knowledge of the content and one with Internet communication skills (especially information architecture)—can be most successful in guiding the development of Web sites through their life-cycle. In order to maintain continuity between products and services, it is essential that in-house staff undertake this task. If outsourced, it will be extremely difficult to learn from previous projects and improve processes and products in the future.

Those involved with planning and managing Web products and services are the primary custodians of the "Big Picture" of Web sites. They must also be comfortable with the guidelines for site development and the management of complex teams. They must have a thorough understanding of the contributions made by all staff in the development process and possess the skills to help them to work together within specified budgets and timelines. These individuals should also have the responsibility for recruiting and managing outside contractors when needed.

### 5.1.2 Text development

While the Web is multimedia in nature, text continues to be the primary content conveyor. In most cases, this content will be text created by program staff although it may be contracted out in specific cases. The types of text necessary for high-quality Web sites are quite varied and strongly associated with the content types outlined in section 4.1. The responsibility for writing each type of text will rest with different individuals. The staff responsible for developing text should also be tasked with developing the appropriate text for meta-tags (title, keywords, description) as outlined in section 6.2.

An organization may also desire to institute processes to edit and approve text before it is posted online in order to improve the quality of its Web sites. If this is done, adequate time should be built into the schedule to permit editing and approval. Furthermore, if an organization wishes to create multilingual Web products and services, additional resources and time must be allocated to translate content and to ensure that all language versions progress in parallel.

### 5.1.3 Graphic design and templates

In order to reduce the costs of graphic design and to improve the usability of the sites, we recommend that a single standard template be developed for most content.

Outsourcing of graphic design can be a successful option. It results in products with a professional look and reduces the strain on program officers of trying to learn an extremely specialized skill set. However, if this option is selected, it is essential that all graphic files (e.g., psd, jpeg) and specifications (e.g., fonts, colour palettes) be provided to the organization to permit future growth and updating of the site.

### 5.1.4 Marketing and distribution

There is a great diversity of online and traditional marketing tools available to promote Web products and services. It is advisable that organizations and networks develop a formal marketing strategy that outlines the scope and responsibilities for these activities. However, even without an overall marketing strategy or corresponding budget, the following measures can be adopted at little or no additional cost:

- include relevant URLs on all print publications, business cards and brochures;
- include relevant URLs in all staff e-mail signature files; and
- announce new Web products and services through press releases and listserv announcements.

## *5.2 Technical tasks*

Technical tasks require specialized training that most program staff do not have. As much as possible, these tasks should be the responsibility of trained professionals.

### 5.2.1 Coding and programming

HTML coding is currently one of the greatest difficulties encountered by many organizations. Most research or program staff find it difficult and the tools to be less than user-friendly. Currently four different management approaches are being used by many sustainable development organizations:

1. outsourced contractors;
2. program officers;
3. technical staff; and
4. in-house programmers.

Each has achieved varying levels of success. While outsourced contractors have created coding of adequate quality, it is extremely difficult for program staff to communicate minor changes or to effectively manage priority projects with external contractors. This approach has proven to be both costly and frustrating. Alternatively, the use of program officers has usually resulted in poor quality HTML coding but more regular content updates. This should not be surprising since program officers are content specialists but often receive little formal training in HTML coding. Technical staff tasked with HTML coding appear to do an adequate job of updating sites regularly while retaining a high

level of HTML quality. However, these tasks are relatively low-level and may take away from their already full schedules of work on maintaining the networks and computer systems for the organization.

The most successful option overall has been the hiring of professional coders and programmers under the guidance of communications or technical staff. In-house coders and programmers are essential to an organization's ability to maintain and update content on a regular basis. When supervised by communications and/or senior technical staff able to help establish priorities and guidelines, their contributions to an organization are invaluable.

It is not advisable for most organizations beginning on the Web to attempt to implement a database-driven content management system. While these tools allow program staff to create and update Web files without needing knowledge of HTML, they are difficult to implement well. Existing off-the-shelf software requires a considerable degree of database support and a clear vision of the evolving information architecture for the site. These are skills that are usually developed with time. Once an organization has gained experience and confidence with database-driven systems, however, it is highly advisable to implement such systems for institutional information, publications, press releases, speeches and newsletters. The initial investment in their establishment will reduce maintenance costs in the long-term.

### 5.2.2 Validating code

In any of the solutions outlined above, work should not be done directly on the live Web site. **Coding and programming should be done on test sites not available to the public. Test all new or redesigned material before posting it live.** Testing should include HTML code validation and link checking as a minimum. Ideally it would also check for appropriate titles and display across various representative platforms. In addition, all applications and database-generated sites would be thoroughly tested against specifications and for performance. If coding has been outsourced, work should not be accepted from the contractor and paid for until it passes these two steps of validation. Once validation has been completed, the material will be posted on the public Web site. If it is an entirely new Web development, usability testing should guide the resulting changes after the prototype stage.

### 5.2.3 Network/server administration

Underlying all Web communications efforts are the basic tasks of network administration. As the integration of information resources management progresses throughout an organization, it may become increasingly difficult to outsource server administration to external contractors. While these contractors may provide excellent quality service, by definition they do not operate within the overall framework of the organization. Their abilities and services should be assessed with the understanding that most commercial service providers are more used to dealing with a single client than navigating the complexities of a networked global organization.

# 6 Agree upon guidelines

Guidelines should not be considered as hard and fast rules of how any design should be done. Instead, they should be viewed as recommendations that should be seriously considered so that there is uniformity across the entire organization. In addition, documented guidelines can help maintain consistency of performance when staff changes inevitably occur.

These following sample guidelines have evolved from IISD's understanding of:

- downloading requirements of users with poor connectivity and low-end browsers;
- growth of Internet use, ensuring that for the near future at least half of the users of most sustainable development sites will have less than one year of WWW experience; and
- indexing requirements of commercial search engines.

## *6.1 Writing and editing*

Write content specifically for the Web, taking into account usability research and Web writing principles. Where the content originated for another medium, such as print, wrap it with Web specific content describing the original content. Understand that the content will ideally be integrated within larger bodies of content within the division.

More specific guidelines might include:

- all staff should have access to a single style guide for both print and electronic publishing that provides guidance on such issues as: spelling, abbreviations and numbers; capitalization and punctuation; citation formats; and lists, headings, notes and tables;
- editing and proofreading should proceed according to this style guide and include content as well as form; and
- e-mail addresses included as contact information should be project- or program-level aliases.

## *6.2 Meta-data*

Apply meta information to all new pages and old pages as they are redesigned. Ideally, this meta information should reflect the dublin core elements,[11] but minimally it should include unique titles for each page. Page-specific descriptions and keywords should also be used if the organization's search engine uses them to rank the relevancy of files or if your target users frequently use search engines other than Google.

More specific guidelines might include:

- Title – Each file should have a title that is unique and meaningful and can stand in isolation (i.e., make sense if someone sees it in their bookmark file three months

[11] Dublin Core Metadata Initiative. "Dublin Core Metadata Element Set, Version 1.1: Reference Description." http://dublincore.org/documents/dces/ (August 3, 2001)

later). The title should be a maximum of 50–100 characters in length and be written with the first letter of each word in upper case.

e.g., South-North Knowledge Network on Climate Change

- Keywords – Each file should have 5–10 keywords or keyword phrases to identify the content; each keyword or keyword phrase should be separated by a comma followed by a space.
- Description – Each file should have a description of 250 characters (including spaces). This description is the text that appears with the title in the results of a search. It must catch users' attentions and tell them what to expect on the page.

### *6.3 Visual design and navigation*

The Web site has to reflect the organization with its look and feel. It needs to be easy to use and must be visually clean. The user must always know that they are at the same site no matter how far they have navigated into it. A proper Web site will use templates to keep the graphic user interface (GUI) consistent.

Things to consider when determining the visual design of a site:

- Links as text – Always assume some of the users may only have text-browsers or may not be able to decipher what link an image refers to.
- Colour scheme – Generally the organization's colours will be used. Keep in mind that bright backgrounds are very distracting and text should be easily distinguishable. The use of images as background is also not recommended as it will make the page slower to download and it will be hard to have text readable on all areas.
- Navigation – The user should be able to instantly see and know how to use the navigation on the site. However the navigation is shown on the page it needs to remain in the same position throughout the web site. This will allow the user control over their movement within a site.

Navigation is the key to ensure that users can get to the information with ease. If the information architecture has been well planned, the navigation scheme should be simple.

Typical navigation in a web site should consist of the following:

- a link to the home page from every page;
- a site-wide search engine accessible from every page;
- the ability to move between sections as defined by your architecture;
- the ability to move within a given sub-section among individual pages of that sub-section;
- the ability to see the entire architecture of the site (a site map or site index) from anywhere on the site;
- a visual cue to let the user know where they are in relation to the site's architecture. This might take the form of an arrow pointing to the page one is on within a list of pages; and
- a response to any occurrence of an error (i.e., a missing page) that is understandable and provides some kind of alternate action.

With so many different issues to resolve in a single design, it might be difficult to determine whether a design is successful. The only proper way to gauge success is through user testing.

## *6.4 Coding and file management*

All files appearing in the Web must be properly coded, given a unique file name and filed within the overall site directory structure. For larger sites, database-driven content management or software development systems can help to ensure that standards are followed.

More specific guidelines might include:

- no "under construction" pages. If the file is live on the Web, it should provide useful information to site users. No Web site is ever complete. It is assumed that content will be modified and added to a site over time;
- use Cascading Style Sheets (CSS). CSS enables the format of text, headers, graphics, etc., to remain constant throughout the web site. CSS will also save time because if a change is needed in the overall look of the site only one file needs to be changed;
- aim to keep each file size to smaller than 55k; the main page should be around 30k. This can be done by minimizing the use of graphics and optimizing graphics files for the Web;
- all the graphics that appear on the site should be easy to access and reproduce, so that future staff can carry on where someone else left off;
- always avoid excessive use of frames. They can lead to confusion in navigation for the user and do not allow bookmarking; and
- JavaScript, Flash or other advanced features should only be used to enhance the users' ability to access information. While they can add a lot to a Web page's look, they can also alienate users with older browsers and slower download speeds.

In addition, organizations may wish to provide further guidance to Web teams on file naming conventions, HTML standards and coding compatibility with emerging XML initiatives.

### 6.4.1 Naming conventions and directory structures

The first and most simple guidelines to implement are those surrounding the naming of directories and files. This makes the resulting URLs more readable and interpretable. It also makes it easier to for Web developers to locate and modify existing files. Simple guidelines include:

- all HTML files should end in the same suffix (e.g., htm or html)
- graphics files stored in a single folder for each product (e.g., http://sdgateway.net/webgfx/);
- multiple language versions of a file should by indicated by a single system, either retaining the English file name in multiple language directories or keeping files

together but indicating the language through the addition of a prefix (e.g., en_staff.htm, fr_staff.htm, es_staff.htm).

### 6.4.2 HTML standards

HTML (Hypertext Markup Language) is the *lingua franca* for publishing hypertext on the World Wide Web. It is a non-proprietary format and can be created and processed by a wide range of tools, from simple plain text editors– (you type it in from scratch) to sophisticated "What You See Is What You Get" (WYSIWYG) authoring tools. HTML uses tags such as <h1> and </h1> to structure text into headings, paragraphs, lists, hypertext links etc.[12] HTML, as originally conceived, was to be a language for the exchange of scientific and other technical documents, suitable for use by non-document specialists.[13] However, like any other language, HTML has had to evolve over time as it is put to use in new and different contexts.

The World Wide Web Consortium (W3C) produces what are known as "Recommendations" for HTML. These are specifications, developed by W3C working groups, and then voted in by Members of the Consortium. A W3C Recommendation indicates that consensus has been reached among the Consortium Members that a specification is appropriate for widespread use. For each recommendation, there are three "flavours" that Web developers may choose to utilize:

- transitional – for use on content intended for the general public;
- strict – for use when really clean markup is necessary; or
- frameset – for when you want to partition the browser window into two or more frames.

As of December 2000, the current specification is XHTML 1.0. XHTML 1.0 incorporates the flexibility of the Extensible Markup Language (XML) with the HTML tags with which most Web developers are already familiar.[14] Previous recommendations have included HTML 2.0, HTML 3.2, HTML 4.0 and HTML 4.01. Recommendations have been updated, on average, every one to two years. These recommendations then set the standards for the next generation of Web browser software (e.g., Netscape Navigator, Opera, Internet Explorer). For example, Netscape 6 (released in November 2000) supports nearly all aspects of HTML 4.0 (recommended in April 1998).[15]

In order to ensure that your files are accurately rendered on most commercial Web browsers, you should select one of the HTML recommendations and follow it. Validation software packaged with many HTML editors allows you to set which version of HTML

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[12] W3C. "HyperText Markup Language." http://www.w3.org/MarkUp/ (July 19, 2001)
[13] W3C. "XHTML™ 1.0: The Extensible HyperText Markup Language." http://www.w3.org/TR/xhtml1/ (July 19, 2001)
[14] Ibid.
[15] Netscape. "W3C Standards Support in IE and the Netscape Gecko Browser Engine." http://home.netscape.com/browsers/future/standards.html?cp=n6i (July 19, 2001)

you would like to use. For example, Macromedia Dreamweaver 4 and Microsoft FrontPage 2000 both support the creation and validation of HTML 3.2 files.[16]

### 6.4.3 IDML emerging standards for XML

Once a sustainable development organization has mastered creating its sites within the framework of common HTML standards, it should monitor advances on the International Development Markup Language (IDML) Initiative <http://www.idmlinitiative.org/>. This initiative, spearheaded by Bellanet, seeks to establish a "data exchange standard for information that is specific to international development, making it much easier to share information with regional offices, partner agencies and with the public. It will also be easier to find and manage information about who is doing what, and where."[17] IDML is based on XML, a markup standard for networked documents, and consists of a set of custom tags similar to those used in HTML.

While there have been several pilot projects using IDML, most have focused on improving the retrieval of development information from larger international development funding agencies. Given that the structure of IDML is still being revised and that simple tools do not currently exist for IDML markup, it may be several years before it has an impact on the majority of sustainable development organizations. Nevertheless, it is important that these organizations participate, to the degree that they are able, in the discussions on developing and implementing useful Document Type Definitions (DTDs) for files or databases that describe such things as project activities, contact (people), organizations and bibliographic data.

# 7 Special challenges of joint module development

A joint module is a Web product or service created with substantive input from two or more institutions. With the increase in collaborative research and advocacy projects between sustainable development organizations around the world, there has been a corresponding increase in Web modules and sites that require the substantive input of people from multiple organizations. Like any collaborative creative enterprise, they are difficult to manage as the number of participants increases.

Three models of joint module development are discussed below in order from the easiest to manage to the most difficult.

This does not include situations in which one organization develops the content and another provides Web design and coding services. Those situations are considered above with the understanding that specific tasks may be outsourced. However, it is important to understand that managing outsourced contractors requires at least a basic knowledge of

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[16] Macromedia. "Macromedia Dreamweaver 4: Competitive Edge." http://www.macromedia.com/software/dreamweaver/productinfo/matrix/ (July 19, 2001)
[17] IDML Initiative. "About IDML Initiative." http://www.idmlinitiative.org/index2.cfm (July 19, 2001)

Web production procedures in order to ensure that you are asking for what you really want. Fortunately, there are an increasing number of for-profit and not-for-profit Web development firms that place a special emphasis on serving sustainable development organizations. The best firms include extensive consultation and planning processes in their bids to ensure that an organization has an opportunity to define its goals, objectives, specifications and style.

### *7.1 Gateways*

Gateways are the simplest type of collaborative Web production. In essence, they are large directories that permit a select group of people to add and modify links to content. This ability to add references to content is usually undertaken within a password-protected Extranet. Within the Extranet, selected individuals can add or modify links through forms that interact with a centralized database. Gateways contain very little content of their own. They serve primarily to point to the content held on the sites of a network's or project's member organizations. The SD Gateway <http://sdgateway.net/> is an example of a gateway site.

Gateways are effective approaches to joint module development in situations where collaborating institutions are starting to get to know each other. At this point, relationships are being established and organizations are trying to determine to what extent they share similar or complementary perspectives on a sustainable development issue.

In terms of project management, gateways primarily require a level of agreement on the overarching framework of the concepts referred to in the site. Site contributors must understand the categorization scheme and feel comfortable that their content can be accurately presented and catalogued within the framework. For this reason, niche gateways involving a limited number of organizations and very specific subjects are considerably easier to develop than larger ones. Smaller groups working with restricted subject fields tend to have a shared understanding of concepts and their relationship to each other. On the other hand, conflicting understandings of what sustainable development means and how diverse users would like to access the information notoriously plague international gateways on sustainable development.

One of the reasons that gateways are among the easiest joint modules to create is that the responsibility for maintaining them invariably becomes centralized in a single institution. By and large, content creators have little interest in learning the categorization schemes for multiple gateway sites. If they have resources available for marketing, they tend to invest these in writing and distributing a launch announcement through listservs, both their own and others. These launch announcements may be sent to partner organizations and to the Webmasters of related sites as well. The opportunity cost for doing direct cataloguing of links is simply too high, especially since no single gateway will account for a substantial amount of the traffic arriving at their site. At the end of the day, the project manager or network secretariat will end up maintaining the links within the gateway.

### *7.2 Working sites*

Working sites are very similar to gateways, although they focus primarily on the information needs of a much more restricted target audience—often the participants in a particular project or initiative. Most content is made publicly available on the Web to allow for greater transparency and sharing of results from the project.

Unlike gateways, however, working sites tend to contain substantial amounts of content. Content can be added to the site either by sending electronic copies of files and documents to the lead project organizer for posting or through the use of databases that allow for the uploading of complete documents. Some examples of working sites include NCSDnet <http://www.ncsdnetwork.org/>, Acacia <http://www.idrc.ca/acacia/> and the WBCSD Cement Site <http://www.wbcsdcement.org/>.

There are numerous reasons why organizations may find working sites to be the best solution for joint module development:

- they may not have their own Web site to post their own project findings;
- the content may not fit easily into their individual institution's existing Web sites;
- the copyright of the project results may be shared and, therefore, a shared new site may best reflect this; and/or
- project outputs are standard documents that users will wish to download in their entirety.

Working sites require strong project management and an appropriate selection of tools for their users. If many project partners are unfamiliar with database applications and Web-based forums, it is frequently more effective to stick with lower technology options such as e-mailing files to a co-ordinator for HTML markup and posting on the Web for others.

### *7.3 Hub-and-spokes modules*

At a certain point, collaborating institutions may develop their Web communications skills to the point where they wish to present more than standard format reports online. They may begin to want to include more local style and customization. Or they may wish to gain more experience with creating more complex file formats such as multimedia and databases. At this point, the hub-and-spokes model for joint content development may be most appropriate.

This type of module is characterized by the construction of separate modules by each participating organization and a creation of a central hub that provides access and maintains a sense the relationships between the component parts. The hub and the spokes attempt to maintain a degree of consistency in design and navigation to ensure that users understand that each module is part of a greater product. These joint modules can be thought of as analogous to books in which each chapter has been written by a different author, with an initial positioning piece written by the editor (often the author of another chapter as well). Examples of hub-and-spokes modules include:

- the Search for Sustainable Livelihoods <http://sdgateway.net/livelihoods/>; and

- EcoLegis Environmental Law Databases <http://sdgateway.net/ecolegis/>.

Hub-and-spokes modules can be effective solutions when organizations:

- have previous experience in a field and wish to maintain an independent Web presence for their knowledge base;
- have regional specific audiences who may not particularly wish to access content from other regions;
- are new to collaborative Web work and desire to learn each other's working styles more slowly; or
- have little content on their own institutional Web sites and desire to use the joint project to build up their own sites.

The greatest challenge facing hub-and-spokes modules is long term maintenance. Since these modules do not necessarily fit neatly within an institutional Web site, it is possible that there will be no individuals with the clear responsibility for updating and maintaining the modules. In addition, lead organizations may not feel a particular sense of ownership for the hub module. Finally, should any of the modules be moved to a new server or URL, changes will need to be made on each of the other "spoke" modules as well as the hub. While these changes may be minor, collaborating organizations may forget to notify each other of the impact of their individual decisions.

### *7.4 Integrated modules*

Integrated modules are the most tightly managed and constructed joint modules. The result of collaborative work is a single online module (or site) that includes the perspectives of all project partners. Such modules require high levels of trust and the coordination of schedules among collaborating institutions. The challenge in accomplishing this is similar to that of co-authoring a book with three or four institutions. This type of module is most appropriate in situations in which there is either stable long-term funding or the module is conceived as a stand-alone static product. Examples of integrated modules include:

- Introduction to Sustainable Development <http://sdgateway.net/introsd/>; and
- Sustainable Cities <http://www.rec.org/REC/Programs/SustainableCities/>.

## 8 Conclusion

Ultimately, any communications activity will require the designation of a project leader. This person is responsible for overseeing all aspects of the Web project from planning and budgeting to ensuring that the content is developed on time and within specifications. These tasks can be quite complex given that they require a solid understanding of communications practices, Web technologies and sustainable development issues as well as project management in an international context. Four years of experience within the Sustainable Development Communications Network (SDCN) has demonstrated that there are not enough people with these skills to meet the needs of sustainable development

organizations. Nor is there a clear understanding of how to manage these staff members to ensure that they are able to serve as integrating forces within and among related organizations.

For these reasons, the SDCN believes it is essential for the international community to continue to support initiatives such as ItrainOnline that seek to build and maintain the capacity of SD Web managers around the world.