

Learning by Doing

Lessons emerging from the ICT Stories Project

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The ICT Stories Project is a joint activity of IICD and InfoDev.

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INTRODUCTION

“What have we learned?

- That we, the people from developing countries, have to use more imagination and creativity, in lieu of money we don't have;*
- That we all have valuable information to exchange. Traditional knowledge, in exchange for up-to-date information;*
- And most important of all, that we have a unique chance to really stop the devastation of the world by channelling education and information so people can better understand and take care of their quality of life, preserve their environment, and their own culture.”*

Martha Davies, Project Manager Quipune

Jointly sponsored by IICD and *infoDev*, the ICT Stories project is a tool to disseminate field experiences and lessons learned. Its overall objective is to use the format of exemplary ‘stories’ to capture the learning process that accompanies the introduction and implementation of ICTs.

To motivate story owners to share their knowledge, IICD and *infoDev* launched an annual competition. An internationally acclaimed ICT Stories Jury selects the winning stories from a growing database of stories. The winners resulting from this contest participate in an international ICT event to present their story to the public.

To encourage people to submit their stories, an important feature of ICT Stories is that there is no restrictive format. All story owners can elaborate on his or her findings according to his or her own priorities and interests. However, due to the variety of formats and approaches, it is often difficult to abstract general lessons learned from the contributions.

To address this, a team of researchers re-visited some of the stories submitted, seeking to tease out some of the lessons in a standard way. The results are presented in this report. As well as some analysis by the team, the stories have been edited into a format and structure that is more easily accessible and of practical relevance for peer groups. The main inputs came from the story owners, who were willing to re-write their original stories, following guidelines prepared by the team.

Selection Criteria

To choose which stories would be analysed in this project, criteria were used to narrow down the list. The criteria used to generate stories for this ‘learning by doing’ subset are that:

- ICTs are applied within important sectors of development: Governance, the environment, health care, education and livelihood opportunities;
- The project uses ICT in an innovative way;
- The project serves as a model for other initiatives (replicability);
- The project shows other – potential – project owners the factors of success and pitfalls of working with ICTs.

Presentation of the Stories

To make the information as accessible as possible, each story is presented as follows:

- What is **special and interesting** about the story? Why would others want to read it and learn from its experience?
- **Introduction:** What are the main objectives of the project, when did it start and which organisations are the main project owners?
- **Information:** What is the content of the project? What type of data or knowledge is communicated?
- **Communication:** What type of communication is necessary to get the project going? Is there any need for special training, for participatory project design? And what kind of communication is needed to keep the project on track?
- **Technology:** Which hardware and software are used?
- **Main results:** Results of the project until August 2000.
- **Keep in mind:** What were the successes and pitfalls of the project? What should others that are interested in starting similar initiatives be aware of and prepared for?
- **Reference:** Contact details.

Cross Cutting Lessons

While each of the stories tells its own tale and represents a particular experience and set of circumstances, we also learned some cross cutting lessons. Despite the diversity of the stories, in terms of their sectoral focus and geographic location, we found that there are several cross-story factors of success and pitfalls. These include:

- **Infrastructure:** Still one of the biggest challenges.
- **Policy considerations:** Whether authorising others to start their projects, or because it is a partner, Government has a central role to play. It will not cooperate to the fullest if it feels threatened.
- **Local content and language barriers:** Where many people are literate in their own languages only, information from abroad is hardly accessible.
- **Illiteracy:** Particularly in rural areas, this may prevent implementation. It sometimes contributes to a bias towards urban areas.
- **Human resources:** Committed and trained local expertise is crucial to longer-term sustainability, some 'success stories' suffered when early leaders departed.
- **Gender insensitivity:** Many projects 'forgot' to incorporate gender issues and redress the gender balance.
- **ICT expertise:** Unless the equipment is used and maintained appropriately, breakdowns can halt a project.
- **Sustainability:** Durability requires that project managers be aware of and find means to generate money from their projects to use, maintain and upgrade the whole project.

GOVERNANCE

The Information Dispatch: Zambia's First Online News Service

The Information Dispatch is the first Zambian daily online source of news and information. However, it is not a one-dimensional news service. The news site is also used to poll public opinion on issues of national importance and provides them with the opportunity to join online discussions on news items.

While the online news service is the main feature of The Dispatch and functions as its portal, access is free. At the moment, all revenues needed to support the initiative come from side activities, such as the web design and hosting.

Introduction

Although Zambia became the fifth country in Africa to have full access to the Internet in 1994, not much has been done by the media to further develop and harness the benefits of ICT. Like many other African countries, Zambia largely depends on information from well-developed international information networks.

At the onset of the 21st century, two Zambian journalists seized the opportunity created by new ICTs. They created the first online news service of the country, thus successfully combining the possibilities of new technologies with the demand for adequate, timely and accessible information on daily national and international developments.

The Dispatch started as a personal initiative without funding. Nowadays, main revenues come from web design and the hosting of websites.

Information

The paper is organised as any other daily newspaper collecting things that are happening, organising them and sending them out. Except that this happens in practically real time. As soon as The Dispatch obtains news, it can write the article and immediately publish it online. The country's three daily papers publish the news with considerable delay, because of the printing process.

The interactive feature on the Dispatch allows its audience to participate in discussing published ideas. This makes it even more attractive for many people to visit the site times and again. The Dispatch also runs a polling forum, which is the first national platform that allows readers to vote for what action to be taken regarding a national political issue. The forum is designed to inhibit someone from voting twice on the same issue, making it a very authentic and accurate source of people's views and opinions.

Additional to online news and interactive discussions with its readers, The Dispatch is developing a comprehensive and easy to access database with basic data on the Zambian economy, which can be handy for researchers, academics and various other professionals. The site is also promoting and encouraging e-commerce in the country through commercial adverts on its homepage.

Communication

Through interactive facilities such as the polling forum and the discussion page, The Dispatch is in fact facilitating the exchange of information between the general public and Zambia's politicians. Nowadays, The Dispatch is being recognised nationally as a serious opinion poller. The poll on citizen's preferences for next year's presidential and parliamentary elections has kept every politician on their toes to try and sell themselves adequately.

Technology

The choice of hardware and software was based on ease of use and reliability, but security was also important because of possible break-ins to disparage the website. For designing the website, Dispatch has been using Dreamweaver. As for publishing, Dispatch uses an instant web publisher that is programmed with an Intel-machine and Linux. Everything runs on an Apache web server.

Main results

The impact Dispatch has on the local media industry, was vividly demonstrated when the Head of the Journalism Department at Evelyn Hone College asked Dispatch journalists to go and address students about the new media. In fact, the Department is now thinking of introducing online reporting as a subject to its students. Likewise, many local veteran journalists have been approaching Dispatch.

As a result of being available on the World Wide Web, the initiative has received international attention. One of the main results of the recognition of the Dispatch is the strategic partnership with OneWorld International through their Africa office. The Dispatch now records at least 1,000 hits a day. Since the moment the Dispatch has started hosting websites, a number of NGOs have been coming forward to ask the Dispatch to develop and design websites for them. Others are proposing their sites to be hosted as sub-sites on the Dispatch.

Four fulltime jobs have been created and the intention is to work with freelancers, when resources are available, because of the heavy workload.

Things to keep in mind

This success story of the Dispatch has not been without its own difficulties. The biggest brawl has been financial and resource constraints. The founding team took care of most of the Dispatch costs since the project has never been funded.

Starting from scratch

When starting the publication, the gathering of enough stories to launch the site called for discipline and dedication. Walking from one function to another, back to the office, do the stories, edit them and later on give them to somebody to update the site, became a routine schedule. Having been trained for the print media only, it became necessary to acquire Internet-related skills, such as on how to update the news on the Dispatch site. Only when the team grew and was reinforced by a journalist who had attended a course in Desk Top Publishing, things became more stable, and for the first time it was felt that the provision of online news was only the start of The Dispatch activities.

Financial sustainability

The Dispatch started as a trial and error activity by two individuals, for whom making money was not the main purpose. Thus, the initiative is only slowly moving towards financial sustainability. Although the main activity of the Dispatch is the provision of online news services, its revenues come from many side activities. Whereas designing web sites for its clients is now its major source of income, promoting and advertising for E-commerce and other businesses might become more important in the future.

Dependence on Internet Service Provider

As an online service provider, the Dispatch is extremely dependent on its Internet Service Provider (ISP). In fact, the Dispatch had to change provider, in order to remain in the air, which caused a one-month interruption of the news services.

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Lessons Learned by Quipunet on the Internet

Quipunet is a global virtual network. Its volunteers have no other link than a common goal. Using mostly email, they have overcome distances and national borders and have learned how to communicate and cooperate. This has led to significant and very concrete results in areas as diverse as education and disaster relief.

Quipunet shows that, by using simple ICTs, a group of different people can obtain significant results without significant financial or technical resources. It has demonstrated that simple ICTs, combined with a lot of personal effort, can bridge the digital gaps that developing countries are facing.

Introduction

Quipunet is a 'virtual' organisation consisting of volunteers all over the world. Since the latter part of 1995, it has been actively developing and implementing projects, using simple Internet tools as its basic means of communication. The Quipunet volunteers work as 'virtual teams' on a high variety of projects, ranging from the presentation of seminars in cooperation with UN-UNDRR to the collection, shipping and distribution of books and computers to different areas in Peru.

The overall objective of Quipunet is 'to channel resources, materials and knowledge available all over the world to people in need in South America, with emphasis on Peru'. The virtual network assists in the development of affordable communication networks, promotes the development of educational programs at all levels and helps and supports its own professional people residing in Peru to present to the world the marvellous qualities of Peru's indigenous medicines, its Inca heritage and its people. Quipunet is financially self-sustaining.

Information

The initiative does not aim to spread any type of information. Quipunet's mission is to channel whatever support its members can muster towards those that need it. Its members identify specific information needs and use the network to cater to that specific demand. Most of the projects aim at more durable objectives, reflecting the desire to improve living conditions in Peru. The project, identified by the members of the network, aims at bridging the tremendous gap that the developing countries are facing against the growth of the new technology. The information as to the needs of the people comes mainly from Quipunet volunteers who come from rural areas. In return, the information provided by the network comes from the Internet.

Almost all the information has to be translated into Spanish, making its cost prohibitive. This translation is mainly managed during the seminars. Most of the time the meaning of the presentations is being translated. For important documentation and information (some donated) professional translation services are used.

Communication

The organisation was born during a debate on: 'How could you unify our country, being aware that we are a multi-linguistic, multi-cultural society?' Starting with this participatory build-up, Quipunet continues to be characterised by a high level of direct participation by its members. Monthly

newsletters, issued by the Board of Directors, guarantee the feedback between the network's volunteers.

Planning and organisation of each of the projects initiated by members of the network have been carried out through 'correspondence lists'. For example, the seminars given with UN-IDNDR counted on a technical list, a translator's list, a coordinating list, and the regular English and Spanish lists for the 'attendees' to the seminar. This set-up allows for the optimal use of the power of Internet at a global level, as it allows for the interchange of experiences and information between countries like Burkina Faso, Argentina, Canada, China, Egypt, Bolivia and many more.

Although Quipunet has come a long way in obtaining concrete results, it is still a big challenge to get all potential members to communicate through the Internet. Until now, showing the results of the Quipunet efforts and sharing the pride of pioneering in this wonderful field of work helps keeping everyone on board. All volunteers abide by the principle that a little bit of their time spent in participating is always better than no time at all. After all, the sum of all the little efforts gives a great total!

Technology

One of the main reasons this initiative has worked so well in uniting all sorts of people – from housewives to students and from architects to engineers – is that only the simplest Internet technology is used to communicate: the electronic mail. As a result, each member uses whatever technology is available, ranging from Pentium state-of-the-art to 386 word processors. There is an open list where anybody can contribute at will. The rules are straight and simple: no political or religious contributions, and no spam.

One of the major problems has been the creation and maintenance of a communication net with people in rural areas. Even today, with the proliferation of 'cabinas publicas' (telecentres) the communication is not as fluid as one would like it to be. Quipunet members still have to resort to the use of telephone and fax, or even 'chasquis' (messengers in the time of the Incas) to carry documents or money to the rural areas. Here, it has still not been possible to use modern ICTs to bridge the gap between the developed and less developed of the world.

Main results

Currently, the Quipunet virtual team comprises of ninety members, residing in 16 countries. Total project budget has grown from US\$ 3,177 in 1996 to US\$ 24,500 in 2000. So far, all contributions have been made by members and affiliates.

Quipunet co-hosted five UN-IDNDR seminars with a total of 6,000-9,000 hits per seminar. In the field of education, forty high school children and forty teachers received monetary prizes as winners of the first and second Virtual Writing Contests. The third Virtual Contest is already in the planning stage.

Quipunet is also active in the field of disaster relief, by exchanging information as well as by organising the collection, transportation and distribution of basic materials to disaster areas.

Concrete results of Quipunet:

- 7 women trained to be carpenters and who are now earning a living as such;
- 35 children trained to be Little Farmers in Cusco;

- 7 rural Universities received a total of 2,545 books to augment their libraries;
- 4 computers installed in the first 'Tambo' (tele-centre) of Peru.

Things to keep in mind

Not high-tech, but cooperation and communication

From its very start, Quipunet was a participatory project, in which all virtual members took their own initiatives and responsibilities. During its evolutionary process, Quipunet members became aware of the fact that it is not high-tech that is important in certain type of information exchange, but rather the need and simplicity needed to encompass more developing countries.

Lack of financial support in exchange for independence

Quipunet's members decided at the beginning that the network should allow for the maximum of creativity. Therefore Quipunet has chosen to be self-supporting. Now that the project has proven that it works well, Quipunet is ready to look for support to keep on.

Learning by doing

While working as a volunteer, people with high ideals have acquired basic and practical knowledge of ICT. This, in turn, has led to the unexpected results in the form of ICT-based initiatives like E-Connexions, Electronic Commerce Information Exchange (ECIE is a non-profit organisation with the mission to help small businesses learn about computers and Internet), TortasPeru, RadioAndina and Dimension Global. All of these companies and organisations were started by founders of Quipunet and show how, by working as a member of the network, they are now ready to realise their own potential by founding their own businesses, while still helping their country of origin.

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Websites

Web pages on general information on a certain aspect of the ICT-activity:
<http://www.quipu.net>
www.e-connexions.net/conferences/

The Colombian Local Information Service Project

Through a mixture of traditional approaches to communication and ICTs, the Local Information Service (LIS) are able to match local supply with – local – household demand for information. The case sustains that its success depends on the maintenance of a regular stream of communication between local institutions, the personnel of the LIS, and its users. Without a direct contact with main suppliers of information, the use of ICTs would not have been effective.

The database was developed in close cooperation between the project owners, the direct users of the service and a specialised systems engineer. Thus, the database meets the demand as well as the expectations of its users.

Introduction

In 1991 the Comfenalco created the Local Information Service. At that time, the existing service system of the national library of Caracas served as a point of reference. In the course of the development of the Comfenalco project in Antioquia, project characteristics were adapted to the local conditions in the north-eastern corner of Colombia.

The major objective of the Local Information Service is to offer households and families access to information that is of interest to them in their daily lives. The service is provided through local libraries. Comfenalco, the Colombian 'Bureau for Family Compensation' has funded and managed the project.

Information

The role of the Local Information Service is the gathering, organisation and provision of the information generated by members of the community in the fields of culture, education, transport, health, public affairs and community participation.

As a first step towards a full-fledged information service, Comfenalco started by collecting information about public affairs formalities, such as the requisitioning of a passport or a birth certificate, as they still are of primary concern to local citizens in remote areas. Following these primary services, information on cultural activities in the Medellín area, but also denouncements of human rights violations and themes directly related to social and political community issues was developed. This information is regularly updated, through a time-intensive process of information gathering amongst all relevant institutions.

Communication

Before setting up the service, the library did not meet many of the user's information needs concerning local and community affairs. Therefore, one of the main challenges in the start-up phase of the project was to create a database by collecting relevant information. In order to achieve a complete set of data, it was necessary to establish a personal contact between the project owners and local and central institutions, requesting for brochures, leaflets and documents about those institutions. In addition, daily newspapers were asked to provide regular information. In order to upkeep the database, Comfenalco still performs these activities on regular basis.

One of the most striking experiences during the process of information gathering was the fact that most institutions were not aware of the value of the information they generated day by day. Only

when these institutions finally acceded to the up-to-date information system did they start to understand the importance of making their activities and knowledge known to all members of their community.

Technology

The criteria for the content, formats of information, and methodology, determine the type of software that is suitable to the specific demand for information in each community. After a long search, Comfenalco decided to start the development of not only a bibliographical but also a relational database that suits the purpose of the LIS. Thus, they hired a Microsoft Certified Systems Engineer and developed a work plan.

Local LIS personnel are given the task to gather and analyse stored data of the service rendered during the first two years of the project. As a next step, the team defines a hierarchical structure of categories and subcategories that will become the basis for the data recovery. Their proposal was analysed and criticised by specialists. Finally the components of the different worksheets – institutions, official norms, events, personalities, and stimulus to the cultural creation – were defined. The process of developing and creating the database was participatory and interdisciplinary. Professional librarians and information systems experts as well as user groups were asked for their input. Finally, the establishment of new conceptual and technical criteria demanded a redesign of the procedures of gathering and analysing data within the LIS itself.

Today, the database is available on Internet. The application is developed on Visual Interdev running on an SQL Server 6.5 and a Windows NT 4.0 operating system platform. Both hardware and software were selected after the rigorous process of planning and development of the LIS-specific database. Comfenalco provides for the funding of all soft and hard technology.

Main results

Today a user enters the Local Information Service asking for information on how to obtain his passport. The consultation takes only a few minutes. Accordingly from any other place in the world this may also be accomplished.

The role of community libraries has been strengthened significantly. Before the start of the services, libraries in the area were not able to meet their primary objective: to provide information on local affairs and events. With the integration of the LIS in these community centres, they have regained their ability to strengthen the cultural identity and community participation in their direct area of influence.

The database was published on the Internet in 1999. Until August 2000, forty thousand people visited the site. Visits to all Local Information Services amounted to more than a hundred thousand, spread over its different kinds of services.

Things to keep in mind

Community specific databases

The selected areas of interest respond to the specific community demand for information. Thus, it is hard to affirm that the same needs are going to concur in other communities. Nevertheless, basic aspects as health, education and citizen participation are of general interest for almost all communities. Hence, other libraries or units of information may benefit from the fieldwork by LIS in

Antioquia as a starting point for the design of a similar service. For a good start, it is important to make an accurate diagnostic of the community's information needs.

Awareness on the value of information

Before the start of the LIS, local institutions seem to have been totally unaware of the real value of their information. Therefore, it is necessary to keep in permanent touch with the organised groups of the community through bulletins, phone calls, emails and personal visits, to keep them up to date with developments.

User-friendly software

LIS has developed user-friendly software that responds to the needs and capabilities of local communities. Thus, without the need for big investments on software it has accomplished a wide service spectrum. As the software is easily upgraded, easy to purchase and has good servicing support, this approach may be worthwhile for other organisations that set out to develop community information services.

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Contacts

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Website

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ENVIRONMENT

Building Capacity in Mexico: The Environmental Link

Issues in today's world are invariably complex and require a multidisciplinary approach for analysis and decision-making. This means that government, the science community, and the industrial and civil societies must reach a common understanding of the underlying issues and challenges, while having access to relevant data and information.

Through the use of innovative systems it is possible to find data and to carry out the analysis of multidisciplinary data that leads to an understanding of issues, and to the knowledge necessary to make a sound decision.

Introduction

CICEANA – Centro de Información y Comunicación Ambiental de Norte América - has created a distributed network in Mexico in order to access multidisciplinary data and information. This experience has been a main effort to identify those environmental organisations interested in sharing data and information in order to be available to general public, decision-makers, teachers and mass media in Mexico. Access to information increases the understanding and awareness of those causing impacts, helps to empower those affected, and intensifies public scrutiny of the public agencies charged with environmental protection responsibilities.

CICEANA's main objectives are: 'To work in the environmental sector in order to create a new conscience regarding sustainable development and to co-ordinate the efforts of many government agencies and NGOs to disseminate environmental related data and information'. CICEANA fulfils these objectives through establishing an environmental information cooperative in Mexico; the development of electronically distributed catalogue data and information, and continuous training for data providers and users. The main objective of the electronic standardized documentation is to make it accessible in Spanish and to facilitate query and consistent presentation across Mexico and Central America.

The project receives grants from the Fondo para la Comunicacion Ambiental, which received part of the money through a charity rock concert and sponsorship by individuals, companies or organisations. The project started in April 1999.

Information

The catalogue system is a collection of metadata records that describe data and information resources and through which the latter can be accessed. Creation and standardization of metadata is critical for conducting successful data searches across institutions and networks.

The metadata developed at CICEANA has been done in accordance with the thematic areas presented in CICEANA's web page. These are: biodiversity and biosafety, climatic change, environmental resources (air, water and soil), sustainable development (protected areas, industry and environment, environmental management and legislation, eco-tourism, environmental

alternatives, trade and environment), economy and society, environmental communication and education, pollution and human health and science and technology.

The metadata available through the catalogue provide hypertext linkages that enable users to directly download the digital data in one or more formats. The metadata development includes activities for entering, editing, pre-processing, post-processing, and validating metadata. Available databases that have been selected contain specific environmental information generated or compiled by governmental and non-governmental organisations, universities and research institutions.

The project includes not only catalogues from Mexico but also from Central America: El Salvador, Guatemala, Honduras and Nicaragua. The catalogue has a total of 4,660 metadata.

Communication

The catalogue system, created under this project, is available to the general public through Internet (<http://isite.ciceana.org.mx>). Metadata provide information that supports the location, access and appropriate use of datasets, databases and other biodiversity information resources. The architecture of the catalogue allows the user to search in distributed servers, but in a unified manner.

Under this project, CICEANA has provided technical support, infrastructure and training to participating institutions, in order to create a regional, multi-disciplinary, distributed catalogue system, where metadata reside.

CICEANA started with diverse courses and workshops with the main objective to create the infrastructure necessary to access, disseminate and utilise data and information for the decision making process. CICEANA has developed five advanced training courses in the area of Internet services and information systems.

To implement the Environmental Information Cooperative, first contacts have been established with different governmental agencies, academic institutions and NGOs, responsible for creating and disseminating environmental information in Mexico. The strategy was focused on establishing solid relationships with main data providers in the country. The participants act as source of the metadata. On the other hand, through the catalogue there is the opportunity to promote the environmental information and the institution involved. All the participants were involved through an invitation to participate in the catalogue and with a letter of agreement between CICEANA and the organisation. This would assure the feedback and the ongoing activities.

Also the Information Cooperative Newsletter was published each quarter and sent to international organisations, official institutions, universities, research centres and NGOs. Besides the newsletter the seminar 'The State of Environmental Information in Mexico' was organised and attended by over 150 people.

The network of governmental and non-governmental organisations provides a forum for sharing information and infrastructure, and for discussions of data and metadata standards. On the other hand, CICEANA provided the facilities for meetings with the cooperative members and helped them with the development and systematisation of environmental information. The project benefits all sectors of society in Mexico, since through accurate information, practical steps and actions can be applied for a better environment.

Technology

The catalogue system consists of two major components: the gateway and the distributed nodes. It allows users to search for data and information through the catalogue gateway that contains a user-friendly web interface. The gateway provides a way to establish a session between a standard http server and any remote Z39.50-server. The gateway sends a user request to multiple spatial data servers or network nodes that contain metadata. It is at these servers where the search takes place. These servers are currently located in Mexico, Honduras, Nicaragua, El Salvador, and Guatemala. The Clearinghouse is the collection of the 8 spatial data servers, that contain environmental data and information of maps, satellite images and databases that can be searched through a single interface based on their descriptions.

The platform that supports the catalogue is Linux Red Hat 6.1 and the software used to establish the catalogue system is Isite Version 2.01 and Isearch. This software was selected because it is freeware, under the GNU General Public Licenses and has the advantage that once people know the use of Linux and Isite, it is simpler to adapt them to the necessities of the catalogue. Additionally, Isite allows the integration of a database system with other open Internet systems and protocols, such as the World Wide Web (WWW), Gopher, electronic mail and, most importantly, ANSI/NISO Z39.50. The primary protocol, Z39.50, offers a variety of search and retrieval facilities suitable for complex database operations. Isite includes Z39.50 communications applications, as well as an http to the Z39.50 gateway, and a complete text search system named Isearch.

Under this project, 8 nodes (metadata servers) have been set up, each with its own database. The database type is Isearch, the default search engine by CNIDR, which provides us the ability to make Boolean, full text and fielded searching; the databases are indexed using the lindex utility from Isearch. The hardware used for the gateway server is a HP Net Server LXe PRO 54GB, which supports all the load of information of the Clearinghouse. For each one of the nodes the hardware use is a PC Pentium 4.86 KHz (minimum). These machines do not require great capacity of processing because they only contain the database of the metadata and the programme to communicate with the gateway server.

The main challenges CICEANA had to face in the development of the gateway and the Clearinghouse nodes were to train the people in charge of the nodes in the use of Linux (because most of them were accustomed to use Windows as their operating system) and to become familiar with the use of Corpsmet and its tools.

Main results

CICEANA's Environmental Information Center created a distributed network in Mexico, in order to facilitate access to multidisciplinary data and information. The entry point for this network is a catalogue system (<http://isite.ciceana.org.mx>), which has been designed in accord with international standards, and which provides access to over 2,000 databases in Mexico. The average number of catalogue accesses per month over the eight months (December 1999 – July 2000) has been 18,000.

This system today is serving as the basis for the information needs of programmes, such as the Mesoamerican Biological Corridor, and the Inter-American Biodiversity Information Network IABIN, and constitutes the core for the development of a national knowledge gateway in Mesoamerican countries.

Things to keep in mind

Successful searching

Creation and standardization of metadata is critical for conducting successful data searches across institutions and networks. The need for standardized sets of metadata has become more apparent with the development of the Internet, and importance of developing compatible environmental information systems accessible through the web.

Sharing information

The main problems faced to obtain the databases were related to the reticence to share the information from different organisations. It takes time and effort to establish solid relationships.

Building a database

The development of an electronic information network provides the opportunity to the identification and documentation of data. Remember that cataloguing is an essential step in making the information available.

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The Greater Johannesburg 'State of the Environment Report' on the Internet

In South Africa's fledging democracy, the Greater Johannesburg 'State of the Environment Report' makes comprehensive environmental information openly and freely available to the general public. The Report is distributed through the Internet, in order to satisfy the demands of two different user groups. On the one hand it serves other cities by allowing them to compare their environmental situation. On the other hand, it fulfils the need for accessible and reliable information by local communities.

Comparisons between cities on an international level were facilitated by software developed during the drafting of 15 Reports by cities all over the world. Because of using the software, the comparisons between their electronic reports became significantly easier.

Introduction

Greater Johannesburg, the largest city in South Africa, has participated in the initiative to produce a State of the Environment Report under the auspices of the Cities Environment Report on the Internet (CEROI). The specific aim of CEROI is to enhance environmental awareness and decision making by providing access to information on the city's environmental issues in a user-friendly, easily comprehensible manner, and to give a metropolitan-wide overview to both a professional and non-professional audience.

The project was initiated in October 1997, and was co-ordinated with the national Department of Environmental Affairs and Tourism (DEAT).

Information

The content of the State of the Environment Report is the result of extensive community participation. The communities identified six environmental priorities, which now form the core of the Report: pollution, waste management, open space, conservation, poverty and environmental health. Although the content on the website is specific to Greater Johannesburg, the format and style of reporting has been designed in such a way that it allows for international comparison and benchmarking amongst the fifteen cities participating in the CEROI project. Thus, the information collected for each of the indicators has been analysed in terms of its driving force, pressure, state, impact and response.

Information on the core issues was gathered from different departments within the Greater Johannesburg Metropolitan Council. In the process of information gathering, the main problems encountered were the lack of information, the fact that available information was outdated or only covered smaller parts of the metropolitan area, and the lack of standardised information and database formats. To overcome these problems, the Internet was used to ask stakeholders to assist in updating and completing the gaps in the Report. Thus, the Internet facilitates the information exchange necessary to build up and maintain an environmental database.

Communication

The information is mainly spread through the Internet site. For all local government officials within the Greater Johannesburg metropolitan area a special Intranet site is accessible.

According to national legislation, local government in South Africa is required to engage with communities in public participation in the process of formulating future development objectives (LDOs) in their local areas. The LDO process allows for communities to articulate their needs, priorities and problems, so that these can be incorporated into the planning process to ensure that development as a whole occurs in a sustainable, responsive and equitable manner. The six environmental priorities that form the core of the Report were identified through the LDO process.

To develop a sound information base, website visitors are encouraged to continue this participatory process by giving input as to the nature of information they require. They are also invited to contribute materials or information to the environmental database for the metropolitan area.

There were numerous training workshops and expert technical support measures put in place during the duration of the project. Any difficulties with the software were quickly resolved through the remote support given by the technical team that was readily accessible by e-mail.

Technology

The hardware used includes Pentium-equipped computers for word-processing, design and publishing of the website. A Pentium III-500 functions as the server for the website.

The main objective of the CEROI Programme is to bring together a network of cities that want to make information about their environment available on the Internet in an easy-to-understand, well structured and internationally comparable format. Thus, Greater Johannesburg was supplied with software called 'Publikit' by Uglund Totalkart, which provides one with the necessary tools to design, publish and maintain Internet sites.

In creating the website, the 15 cities assisted in testing and de-bugging the beta versions of Publikit. Although Publikit has been designed for environmental reporting, the basic template of the software can easily be applied to many other activities through the substitution of headings, themes, ideas, backgrounds and icons, which the software offers.

Whereas the basic structure / template of Publikit was used for the purpose of comparing information with the other pilot cities, Microsoft Front Page Editor was used to modify the information, being easier to manage. However, the latest improved version of Publikit is very easy to follow and use to design one's own web pages. The software was supplied by Uglund Publikit and funded by the Ministry of Environment in Norway and CEROI. They also made funding available for the purchase of the server for the project.

Main results

The participating cities in South Africa (Johannesburg, Cape Town, Durban and Pretoria) jointly launched their respective State of the Environment Reports in October 1999. The first 8 months counted well over a thousand visitors to the Internet site and 1,050 visitors to the Intranet site.

Many private companies have shown an interest in the site, particularly in the GIS maps. This indicates that the website is an important conduit for linking the public and private sectors, and enhances public private partnerships that may set out to jointly tackle environmental problems.

Numerous local communities have shown an interest in the environmental data. As knowledge is the first step to action, the website will serve as a catalyst for dealing with the environmental priorities faced by the city and its communities.

Things to keep in mind

Software development

The project set out to test and improve software developed for the project (Publikit software). Through this intensive testing in real-time activities, the package is now ready to be used world wide and within diverse sectors. However, the participating cities all needed some degree of technical training to equip them with the necessary skills in order to create such a report on the Internet.

Building a database through the Internet

The start of an information gathering process is tenuous and frustrating. Often necessary information cannot be found, and existing information is not available or is incomplete. The Internet can serve as a very valuable source of additional information, when site visitors and users of existing information are invited to contribute actively to the database development, and are allowed to make suggestions on improvement of the existing structure of that database.

Comparison of data, but maintenance of identity

Although the comparison of data between different cities all over the world is important, it is essential that each city and project maintain its own identity through this process and the Report. The product should never become a generic technical report, but a report that can be readily identified as being specific to a locality with its own character and 'flavour'.

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The Msunduzi River Catchment Electronic Network – South Africa

A great many of the people living in river catchment areas come from disadvantaged backgrounds, are poorly educated, and have limited understanding of environmental and development issues. This, combined with inappropriate development and land use by administrative and management authorities, and commercial and industrial interests, is causing a significant decline in the environmental health of the catchment areas.

Introduction

The Msunduzi Catchment forms a part of the Mgeni Catchment Management Plan of Umgeni Water.

The historical roots of this programme go back to 25 December 1995, where the need for improved information management and communication in a catchment context was spurred by the floods of Christmas day 1995. This flood devastated areas of the catchment, killed 160 people and displaced over 500 families. These people had all settled in flood risk areas. This disaster illustrated graphically to what extent marginalized and disadvantaged people have been separated from environmental processes. A general lack of comprehension and understanding of the dangers of settling on floodplains, a lack of opportunities to settle elsewhere, a deteriorating catchment and an episodic rainfall formed a highly lethal combination. While a project was initiated to provide short-term solutions to the flooding – simply to identify those living in areas in extreme risk and move them – there was the general recognition that a more holistic catchment management approach was required, in order to solve the multifaceted problems that exist in the catchment. With funds donated by the GTZ Rural Development Foundation, four organisations teamed up to commence the Msunduzi Integrated Catchment Management Initiative. They were the:

- Institute of Natural Resources (INR)
- Greater Edendale Environmental Network (GREEN)
- Computing Centre for Water Research (CCWR)
- Share-Net

The project's overall objective is to improve decision-making through effective communication and information management on environment and development issues among communities and institutions in the Msunduzi River catchment. The initial initiative started in July 1997 and the documents were put together in October 1997 for discussion. The actual programme kicked off in March 1998. This initiative was started by the people from KwaZulu Natal Midlands, and by the community member organisations within this region.

Information

There is general agreement that for any catchment based activity to be successful effective communication and co-creation of information is vitally critical. The sharing of information and coordination of actions based on that information between and within sectors and levels of society is also important. A specific issue is access to relevant information by, and effective communication with organisations that represent the various communities resident in the catchment. So as to address this, the INR, with technical and conceptual support from the CCWR commenced with a pilot project and is establishing three electronic communication and information centres within or

linked to communities. As a result, core activity is information about conservation, environment, awareness, knowledge, economics, agriculture, clean water and sanitation, and human right and injustice.

This type of project is relevant at all levels: civil society, regional and international. Its relevancy is also about reviewing the international, national, regional and local community based communication and information systems. It is important to test and validate electronic information and communication models that focus on community groups, so that they can be applied broadly at local and regional levels that deliver input for international strategy. One of the keys to addressing these issues is improving the understanding of those whose actions have impact on the environment: not only the poor, but also industrialists, developers and city administrators.

Communication

For most people, gaining access to information and interacting through formal education on environment and development issues is not a realistic option. Gaining knowledge and understanding what allows people to make informed decisions on their lives and the environment, has to take a different and less formal route. 'Local-Local' dialogue – interaction and the exchange of information between community groups, between community groups and experts, and between community groups, NGOs and government – is essential so that different perspectives are understood and all parties are empowered to take decisions and act effectively.

Hence the organisation is close to the affected communities and plays the role of interface. GREEN was facing challenges of providing innovative ways of dealing with the problem, as it was proven in the past that most of the initiatives failed as a result of non-community involvement. GREEN was challenged to lead and champion the initiative.

The people have to learn to use this information, compare it to their living environment and see that it can be used to enhance their quality of life in areas like food production, sustainable land use and water quality. This type of programme is now called 'land care at government level'. In the beginning it was hard for them to understand how to find ways of implementing the programme and to make this type of information work for them. Population sensitisation has done marvels through TV spots, radio, flyers and urban planning restructuring.

Another way of communication is the use of community workshops with strong emphasis on participating in and contributing to finding a possible solution to the problem. The workshops deal with environmental crises participation, learning and action, person-to-person communication and interviews, face-to-face interaction with user groups, local-local dialogue, posters, newsletters and fact sheets. The Greater Edendale Environmental Network and the Institute of Natural Resources held a community-based workshop with about 50 participants in Pietermaritzburg-Msunduzi recently. The objective was to introduce community leaders to the concept of Integrated Catchment Management and to establish a common vision for the catchment. The community leaders cited a lack of information as one of the major constraints to effective environmental management of the catchments.

The areas that were most affected were first targeted. The participants were involved from the initial stage during the project design and they were contributing ideas of how the information should be collected and disseminated. Ongoing field visits and groups meetings, interactions through Internet and exchange of information are also taking place on regular basis. The feedback is handled in the group, focusing on developing and strengthening networking capabilities.

The main challenge was to deal with the lack of resources within the organisation in general and the lack of communication equipment and infrastructure. There were difficulties with telephone connections, power and security. Also there were major differences in the level of understanding between different areas, and between the levels of education of the participating groups. Then there was a language barrier between participants and a lack of mass media communication, like television, radio and newspapers. The strategy that we used to overcome these challenges was to provide training in, for example, communication skills and computer literacy; skills that open doors for communication infrastructure to development in some areas.

There is great potential in the technology merging with local knowledge and the use of local languages. In the long term this programme will enable the indigenous people to develop their own software, which will allow them to communicate in their own languages.

Technology

Hardware and software are chosen for their user friendliness. The project has Meccer computers, router communication, ISDN line, telephone and fax machine; reliable and easy to use technology. The software used is Microsoft, Corel 8, and Mweb (black box). In some areas regular postal services were used. The acquisition of the hardware and software for this project comes from donor funding.

There was no use for technology if we did not provide training and know-how before purchasing. Another challenge was to increase the level of responsibility and engagement to the new working environment.

Main results

Since the programme started, other institutions have joined the network and supported it. Other communities and groups have shown interest. The agricultural group has initiated their agricultural network and the newly born programme is known as Environmental Education Electronic Information School Network, aiming to assist teachers with information and enhance the level of education and understanding especially on environmental education.

This programme is designed to address regional crises. It is relevant worldwide and is not restricted to a particular country. The information can also be used in areas that have similar problems. The information the project provides is copyrighted.

Things to keep in mind

Lack of knowledge

On relevant issues the lack of knowledge could lead to poor environmental health or an inability to rectify the problem. Conversely, 'information overload' can be overwhelming without the necessary guidance on how to filter out the relevant information in order to use the knowledge to improve environmental quality.

Test and validate

Electronic information and communication models that focus on community groups need to be tested and validated. That way they can be applied broadly at local and regional levels and contribute to national and international strategy.

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Ghana - Environmental Information Network

When recognizing the importance of accessible information, the Environmental Protection Agency (EPA) has made the provision and dissemination of information one of the main issues of its policies towards sustainable development.

Data from various government institutions are linked and made accessible to other stakeholders through the use of ICTs. By linking institutions, the new technologies have allowed for an enormous cost reduction for the retrieval of information. Likewise, by allowing more people to use existing information, the added value of these existing sources of knowledge is greatly enhanced.

By investing considerable amounts of time and money in the development of in-house skills – web development and information management – the EPA is assuring the managerial sustainability of the Network. Today, the project team at EPA consists of six officers, including representatives of the library and technical staff.

Introduction

In Vision 2020, the Government of Ghana envisions the country among the middle ranking developed nations by the year 2020. The nation's success in achieving and sustaining this vision will depend on its ability to integrate development priorities and environmental protection priorities. The Environmental Protection Agency is designated by the government to manage all environmental issues in the country.

As environmental management cuts across all sectors, environmental managers and other stakeholders require diverse information in order to achieve objectives set for the protection of the environment. During the preparation of the National Environmental Action Plan in 1988, it became clear that environmental information was lacking or inadequate for planning purposes, mainly because existing information was scattered among specialist institutions. Thus the EPA set out to create the Environmental Information Network (EIN).

The main objective of the EIN is to provide up to date information on the environment to all sectors of the Ghanaian society, by making information accessible through enhancing the overall capacity for institutional networking information management. The project focused on the development of electronic information services at the national and regional centres of EPA, the Forestry Research Institute of Ghana (FORIG) and the Building and Road Research Institute (BRR).

While EPA, through grants of the Government of Ghana funds the salaries and allowances and basic operational costs, IICD (International Institute for Communication and Development) is the main financing source for the equipment and training in web development.

Information

Ghana has a long history of good scientific research, but over the years library and information services have deteriorated. As a result, valuable information is difficult to find. Thus the project seeks to create a web-based system to facilitate access to the available information and create facilities for users to search through various databases via Internet.

The services provided by the EIN include general environmental information, bibliographies and directories on environmental information. Furthermore, EIN sets out to speed information delivery and promote inter-library loan services using a mix of e-mail, fax and telephone.

Communication

The information managers of the EPA formulated the project indoors and without the participation of EPA partners or of potential users of the Network. Through its daily interaction with a cross section of people in need of environmental information and organisations, all potential risks and constraints were already known, and there was no further need for specific consultations. In fact, EPA considers the users of EIN as the consumers of information services, and the partner institutions as the suppliers of information.

On the other hand, before drawing up a budget for the EIN, the information managers felt that they needed to acquire in-depth knowledge about equipment and what ICTs could offer them. Thus, training in product and equipment specification were carried out before a budget was defined.

By collecting data on the actual behaviour of the visitors of EIN, the changing demand of users of environmental information is continuously monitored. Following these monitoring activities, the characteristics of the Network are adapted to respond to these changing needs

Technology

The main communication technologies are telephone, fax and email. The project communicates with the partners using these technologies. Likewise, users reach the project partners through the same media.

The project uses three computers, three DELL Servers (FTP, File & Mail Servers), three UPS units, 1HP DeskJet 1120C (printer), 1 HP ScanJet 6100C (scanner), 1 laptop, 1 heavy-duty photocopier, 1 laser printer. The servers are used to support services produced using the LAN. The UPS is a back up for electricity power supply in case of power failure, while the printers and the photocopiers are for producing hard copies of documents.

Software in use by the project comprises mostly Microsoft Windows Office: Word, Excel, Access, PowerPoint, and Windows NT. They were chosen because they are user-friendly. Due to undeveloped computer usage culture, very simple software programmes were chosen to help project staff and users gain confidence in computer usage.

Main results

The Environmental Information Network started in August 1999 and is operational. The project team has received extensive ICT training enabling them to upgrade facilities, the website (www.epa.gov.gh) and electronic information services on environment.

Environmental information usage is growing steadily. The number of people using the EPA library and information services provided, is on the increase since the project was started, now averages about 600 visits a month.

While about 90% of the users come from scientific institutions such as the University of Ghana and the Accra Polytechnic, the private and public sector, such as the Ministry of Health and Chartered Institute of Marketing, also use the facilities.

The use of ICTs enabled EIN to link up with both national and international sources of environmental information, such as INFOTERRA. Via Internet, these linkages make a wide range of environmental information available to many users.

Things to keep in mind

Creation of in-house capacities

By investing time and money in training in-house information managers, the EPA is assuring the sustainability of the EIN. Apart from making the agency independent of external consultants, it has assured the identification and implementation of appropriate technologies, such as relatively simple software programmes. These do not only allow the project staff and users to gain confidence in computer usage, but also reflect the potential of the locally available hardware.

Typical problems

The development of EIN has to deal with a seemingly endless amount of daily problems typical for development countries, ranging from congested telephone lines to bureaucratic red tape and a general lack of IT-culture. Nonetheless, the project is advancing rapidly, and statistics show an increasing use of the information facilities.

Financial sustainability

The projected revenue targets have not been realised, endangering the financial sustainability of the EIN. However, the moment the Network starts to provide tailor-made services and online searches and has links with the partner institutions, more clients will come and revenues may go up. Future revenues are expected to cover the operational costs of the system. At this moment, providing photocopier services and charging cost-based fees for online searches and tailor-made services generate the EIN revenues.

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HEALTH

Internet-based Tobacco Control Network launched in Czech Republic

The Internet-based Tobacco Control Network uses ICTs as a basis for communication and training of professionals working in the field of health and raising awareness.

As the traditional media, such as TV and newspapers, refuse to publish anti-tobacco information, an Internet-based demonstration project is now used to reach the Network's target group: Decision-makers and the general public.

The project shows how specialized knowledge on awareness raising campaigns can be transferred from one country to another by using relatively simple ICTs: e-mail and Internet. The creation of a Control Network has not been an end in itself. It was a necessary step towards the establishment of the Czech Heart Association, which was inaugurated in May 2000.

Introduction

The World Bank enabled the US-based Centre for Communications, Health and Environment (CECHE) and its two Czech partners — the Institute for Clinical and Experimental Medicine (IKEM) and the National Institute of Public Health (NIPH) — to launch an Internet-based communications programme aimed at tobacco control in the Czech Republic.

The initiative is a direct follow-up to a joint US-Czech programme in 1991, aimed at reducing the risks of cerebrovascular and cardiovascular diseases in the Czech Republic. The main goal of the initiative is to build capacity amongst Czech health professionals, non-government organisations and layman volunteers in the use of contemporary information technology to heighten public awareness and catalyse policy change necessary for the creation of a tobacco-free environment in the Czech Republic.

The project set out to reach this objective by forming an Internet-based network comprising health professionals and NGOs, and by training individuals and organisations to enhance their use of the Internet for research and communication. One of the main results of the project is the establishment of an advocacy NGO dedicated to reducing tobacco use and reforming tobacco policies in the Czech Republic, the Czech Heart Association.

The Tobacco Control Network started in June 1999, and is being financed by an *InfoDev* grant. Key international partners are UICC-GLOBALink of Geneva, for providing training in Internet and tobacco control communications, and the National Centre for Tobacco-Free Kids and the Advocacy Institute, both in Washington D.C, for training in advocacy and policy reform.

Information

The core content disseminated through the Network is data and information about tobacco use and control, heart diseases, policy and advocacy in those and other health areas through the use of the Internet. Email and Internet facilitate the ongoing exchanges of knowledge and experiences between the Czech and US counterparts.

Communication

A total of 13 NGOs and Czech District Hygiene stations (DITs) were part of the needs assessment phase. The assessment analysed their know-how on tobacco control and their capacity for implementing tobacco control activity.

Ideally, traditional media as radio, TV and newspapers should be carrying the message to the general public. Due to the reluctance of these media to open up to the Network, the Internet is now used as a complementary medium to reach the Czech public. As all DITs and NGOs expressed a strong need for skills training in e-mail and Internet use, the initiative includes training on the use of Internet for both the gathering of information and as a valuable advocacy tool.

To spread information through the Network, IT workshops are first conducted at the project hub, followed by training activities in the various districts of the Czech Republic. Professionals from the American Heart Association, the Campaign for Tobacco-Free kids and other specialist organisations, give 'live' training to the Czech members of the Tobacco Network. These workshops provide an opportunity to establish close contacts between the Network and these organisations. This will be of major use in the future functioning of both the Network and the Czech Heart Association.

The assessment showed that the lack of motivation amongst policy makers to work towards a tobacco-free environment in the Czech Republic is one of the main challenges to the Network. To overcome possible obstacles, the government-based NIPH functions as the main problem solver, building a network and soliciting equipment and facilities from the Health Ministry. In turn, IKEM took the lead in establishing the NGO and medical communities, which now form the basis for the Tobacco Control Network.

The other major challenge is the lack of interest of the Networks major target group; the general public. In order to overcome media reluctance to publish articles on tobacco control – tobacco companies are among their major clients – the Network has organised meetings with publishers and media workshops. Unfortunately, this has been to no avail. Thus, to reach a major audience, in June 1999 CECHÉ and its Czech partners launched an 18 months Internet-based demonstration initiative.

Technology

The primary communications tools amongst the Network members are the Internet for access to information and e-mail for enhancing communication and networking. These technologies do not require compatibility between the different users, and are thus ideal vehicles for the exchange of information and knowledge. Equipment includes mostly 486 or Pentium computers with monitors, modems and peripherals, desktop publishing and Internet software, faxes, printers, and Internet access.

Main results

Since its inception in June 1999, over 30 DITs and NGOs have become members of an electronic tobacco control network. The project has developed an electronic list serve for members in Czech and set up a website that describes the programme, offers information and resources and reports project activities and results.

The project has fostered the creation of the Czech Heart Association in May 2000.

Strategic partnerships have been established with Internet-based organisations such as UICC/GLOBALink, the American Heart Association and pioneers in tobacco control advocacy and policy reform, such as the Washington DC-based National Centre for Tobacco-Free Kids and the Advocacy Institute. Furthermore, partnerships have been formed with tobacco control organisations that are closer to home in Poland, Hungary, Russia, and elsewhere in the CEE-NIS.

Another result of the project is a demand-based resource service through the Czech Heart Association and website on tobacco control equipped with high-quality resource materials for the Internet and computerised database research capabilities that will cater to requests.

Also developed was a programme monitoring system to support programme operations through pre- and post-surveys of knowledge, skills and applications among the participating organisations to assess programme impact.

At the website built there is an electronic bulletin board, resource directory, regular electronic bulletins with nation-wide and international circulation.

Things to keep in mind

Global applicability

The potential for replication and extension of this approach to other CEE-NIS countries and worldwide was the subject of a symposium hosted by CECHE at the 11th World Conference on Tobacco or Health in Chicago in August 2000. While numerous organisations expressed their interest in the Network's approach, the real potential for replication can only be assessed after the evaluation of the project at completion. Obviously, any application in other countries will require adaptation to local needs.

Local champions

The whole process of establishing this type of network is impossible without local champions that lead the effort on a national level. In the Czech case, the project could not have worked without the constant presence and leadership of both the NIPH and IKEM.

Constant evaluation and assessment

To make sure that all members of the Network can voice their interests and needs, the project designers have to allow for ample resources for assessment and evaluation. Only by listening to the participants will it be possible to ensure that both training and advocacy activities are effective. Assessment and evaluation are necessary to redefine campaigns that have worked in other countries to fit the local context.

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The Physician Based Sentinel Surveillance System (PBSS) for Emerging Health and Disease Problems in the Caribbean

Under a Multilateral Agreement, CAREC provides laboratory reference and epidemiology services to 21 member countries, and a sustainable and replicable Internet-based system for the timely surveillance of (re-)emerging health and disease problems in the Caribbean. The network includes Ministries of Health and CAREC, and will also be used for continuing medical education.

Introduction

The Pan American Health Organisation (PAHO) administers CAREC (The Caribbean Epidemiology Centre) on behalf of 21 member countries. CAREC enjoys an international reputation for its work in support of Public Health in the Caribbean.

The Physician Based Sentinel Surveillance Project is an *InfoDev* funded pilot project to develop a replicable Internet-based surveillance system using family physicians in various islands of the Caribbean. The project is housed at the Caribbean Epidemiology Centre in Trinidad and is a collaboration with the participating countries' Ministries of Health and the Caribbean College of Family Practitioners (CCFP).

The overall goal of the project is to strengthen public health surveillance in the Caribbean and thereby increase the mobilisation and use of information for the prevention and control of emerging health and disease problems that threaten the sustainable development of the region. The specific objectives of the project are:

- To implement a physician-based sentinel surveillance system that is easily replicable by other physicians and countries;
- To strengthen the CCFP through development of a network of physicians who are participating in the surveillance of emerging health and disease conditions;
- To explore and develop private sector collaboration to extend the impact of the project;
- To explore the feasibility and development of a physician office management system for more efficient disease prevention and control;
- To develop a continuing distance education program over the Internet in relation to disease control and clinical management of emerging health and disease problems – in collaboration with other partners – as the University of the West Indies.

The project started in June 1998 and has targeted 21 physicians in three Caribbean countries: Jamaica, Trinidad and St. Lucia. In 1999, three more physicians were recruited following the acquisition of three computers from the Walter Reed Army Institute of Research. It is hoped that once the web-based browser system is installed, any physician in the region may participate once they have a computer and Internet access.

Information

The Caribbean region is geographically wide. That means that the surveillance of communicable diseases must cover a territory that ranges from large under-populated mainland countries of Central and South America to small densely populated coral or volcanic islands. Public Health

challenges of the region range from managing chronic and degenerative illnesses, coping with seasonal emergencies stemming from an annual hurricane season, to the worrying rise in HIV epidemic against a background of poverty and drug wars. The region is also host to a large tourism industry with millions of visitors every year. The ease of modern travel has meant that the threat of imported communicable diseases is a real possibility. A sentinel surveillance system that is linked electronically to national and regional public health institutions is therefore a key strategy to identifying such events.

The project has two elements:

- 1) To establish a community based (in this case, small family physician practices in three Caribbean Islands) sentinel surveillance system so that they can augment national systems;
- 2) To strengthen the Caribbean College of Family Physicians as an institution by a variety of activities including the system to conduct distance education projects aimed at improving management of disease prevention and control.

Although the project initially focused on the surveillance of communicable diseases, it can be used to develop surveillance for other diseases as chronic diseases or conditions related to social conditions as non-accidental injury or domestic violence. Thus the PBSS could therefore be used to pilot surveillance systems that would be useful for countries or a region.

A review of the data from the first ten months of the project showed that the system was already functioning as a sentinel surveillance system in agreement with national and regional systems, gave early warning of certain conditions and as a source for hypothesis generation.

The project's challenges have mainly been human ones and a few logistical ones. Learning to use an entirely new technology is a challenge to anyone, but the experience can reveal resources and skills that may not have been recognised. Many of the reporting sites use the practice staff, such as receptionists or secretaries to assist in reporting. This community of workers who work in health care settings in the islands were able to benefit from the training in computer usage. As they, in effect, act as office managers to the practices, the experience of becoming computer literate and being introduced to an integrated information system is expected to improve the practices' function. The project has thus both the intellectual and human challenges to animate it. The experiences of introducing a novel technology sometimes found that the capabilities of the computer are occasionally over-estimated, and the efforts to maintain a computer-based information system, under-estimated.

Finally, the project has raised questions that have great relevance and implications to the other ongoing Information Systems projects at CAREC. The solutions to achieve the project objectives will require the same conceptual thinking that CAREC will have to do to integrate the CARISURV system for laboratory tracking with the Epidemiological reporting that is currently being done. This means that the PBSS could be the vehicle that will lead to the eventual linking of the various regional public health laboratories.

Communication

While there are other physician-based sentinel surveillance systems in existence – the Royal College of General Practitioners in the UK, the Influenza surveillance run by the CDC in the US and the Belgian system – this project is the first in the English-speaking Caribbean to use Internet as its main means of communication.

It is also envisioned that the project could establish the system of linking surveillance reporting electronically with the laboratory surveillance system developed by CAREC-CARISURV and so pave the way for electronic linkages with all the National Laboratories in the Caribbean. Such a system would pool reporting information from the Ministries of Health from all the reporting countries of the Caribbean, link the National Laboratories database and use the PBSS to validate or check trends noticed in the National System as well as develop an efficient system to confirming diagnoses indicated by reported trends. This last element will track diagnostic specimens to National Laboratories and referral to the Public Health laboratories at CAREC.

The main method of communication is currently the email. A website is being created to allow a browser-based system for reporting and this will become the main method of reporting data. The PBSS co-ordinator issues a weekly e-mail update to all participants. Data from the first 10 months of reporting have been examined and certain adjustments have been made to the system, including changing the language of the programme from the dos-based Epi-Info to the more user-friendly Microsoft Access, reviewing and fine-tuning the data system and initiating discussions that will lead to the integration of the system to the laboratory system.

The greatest challenge is trying to conceptually imagine the final system while acknowledging the resources of the project. If anything, the range of possibilities that the project might have for the future is so wide that one can lose sight of the fact that we are at the most human level trying to empower ordinary general practice staff to step onto the 'Information Highway' of the 21st century.

Another challenge will be to change the perception of national domain in the information age; it is possible for information on a health event occurring in the Caribbean to be reported internationally before the National systems are aware of it. Achieving this new level of awareness will be one significant challenge. Should these concerns be overcome, the potential for replicating the system would be useful in other regions where increased communication and access to information would enhance public health interventions. The technology already exists to achieve this end. The challenge is to imagine and design the system and to apply the technological tools to achieve it.

Technology

The system uses ordinary desktop computers with Microsoft Office suite. The data collection system is being converted from dos-based Epi-Info to Microsoft Access. The website was designed using FrontPage. The website enables sentinels to view cumulative information within their country as well as by the region every month.

The system could be widened geographically in scope and in the nature of problems under surveillance at relatively little cost.

The desktop data management system developed for the family physicians can be used to evaluate practice utilisation and as a tool for studies on the patient populations.

Main results

Twenty-four physicians have been equipped with computers and surveillance software. Note: an additional three computers were sourced from the Walter Reed Army Institute of Research.

A patient management/registry system has been designed according to the needs of the participants.

A website for the Caribbean College of Family Practitioners, which will house the PBSS site, has been developed. It was launched at the First Family Conference held by the Caribbean College of Family Practitioners in September 14th to 17th 2000 in Port of Spain, Trinidad.

Data from the first ten months of reporting show that the PBSS is functioning as a sentinel surveillance system providing data that is in agreement with national and regional surveillance data, providing early warning of disease conditions, and providing information for hypothesis generation. It is also an important tool for continuing medical education projects of the Caribbean College of Family Physicians and for strengthening the institutional capacity of the College.

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EDUCATION

Computers for Administrative, Management and Academic Support (CAMAS) Lusaka, Zambia

CAMAS shows how to integrate organisational, educational and operational elements of the daily life of a major organisation by using ICTs, while taking the needs and capabilities of a diversity of direct users into account.

One of the major innovations of this project is that it actively developed a way to stop the brain drain of professional ICT experts from government and other non-profit organisations to the private sector.

The project also shows how donor coordination can ensure that the total impact of donor efforts exceeds the sum of their separate initiatives.

Introduction

The University of Zambia (UNZA) was established in Lusaka in 1965. Starting with three separate schools, the UNZA today consists of nine schools. All except one are located on the Great East Road Campus. The student population is about 4,000 while the academic staff is around 500.

The UNZA has always run on mainframe-based system. As the highest learning institution in the country, it has to move with times. Thus, UNZA decided to become a front-runner by moving towards decentralisation of all operations through the use of ICTs. By installing a campus network, providing Internet access, developing and implementing administrative systems and training staff, CAMAS' Computer Centre is strengthening the university's administrative, management and academic capacities.

The project was financed and supported by a series of different donor agencies and professional institutions from different countries, ranging from the Dutch NUFFIC to the Belgian VLIR, the English DFID and FINNIDA from Finland. The effective management of all financial sources by the Deputy Vice Chancellor made it possible to create synergy between the different project components, blending them into one well-functioning system.

Given this objective and the institutional context, the CAMAS project may function as a source of inspiration for other universities in Africa that are interested in using ICT effectively.

Information

CAMAS provides critical information to all core users of the university, ranging from student records administration and overall management information to research facilities for the senior students and Internet access to all authorised users. Most of the information is garnered from existing systems, although for some new components information gathering is being carried out at this moment.

The administrative objective of the project is to increase the effectiveness and agility of the information flows, by making specific information available and accessible to those who need it.

This meant the decentralisation of the information flows, thus shortening decision circles. Autonomous units should run individual and with specific system components, while only the main administration is to deal with corporate issues.

The second sub-objective is to support the academic core function of the institution; learning and research. The campus network provides access to the library's computerised catalogue and CD-ROM collection, and of course to the Internet through ZAMNET, the provider established by the UNZA.

These facilities are also used for distance education, connecting students and teachers through nine regional centres to the UNZA. Whilst the university has always conducted this kind of learning using the post office as a media, now the contacts between lecturers and students will change to electronic mode.

Communication

From the earliest design phases of CAMAS, the project developers set out to assure the active participation of students, faculty, administration and government. However, due to the lack of time to develop an effective participatory process, real participation in some cases was limited. CAMAS considers this as the main reason for the problems encountered with change management during the implementation process of the project. As the reluctance to accept changes is still hampering the overall successful implementation of the system, external experts are now hired to develop a strategy towards effective change management.

As the main challenge lays in user's appropriation of the systems and thus their total participation in terms of input, content and information, user training in basic computer and Internet skills has proved of major importance to achieve effective participation.

Also, the management of the UNZA participated in a workshop on Information Strategy Planning, which resulted in the UNZA Information Services Strategy Report for the coming years. This strategic plan continues to function as an important vehicle to generate participation from various stakeholders, varying from the UNZA management to donors and external ICT professionals. Over the years, these discussions have supported the UNZA Management in developing its own vision on ICTs, which in turn is the gateway to getting more students enrolled in Distance Learning programs.

The results and future challenges of CAMAS are monitored, resulting in biannual progress reports. Apart from these reports, e-mail has proved to be essential for almost day-to-day communication and coordination between Zambia and other parties. Both the daily e-mail contacts and the biannual reports are a direct input into the discussions between the donor agencies and UNZA on future plans, problem solving measures, etc.

A 'Champion' at the work floor proved to be essential for a continuous communication with all stakeholders: the director of the Computer Centre made sure that within the opportunities provided by management and the available donor inputs, things really happened. He still is the first point of contact for ICT-related activities in the university and remains the chief pilot of ICT activities both at administrative and academic level.

Technology

Hardware and its choice: currently the university has several servers, all hosting different critical applications. SCO UNIX is the standard operating system with isolated use of Windows NT/2000 and LINUX Red Hat spread across the campuses. In establishing the university-wide campus network, all buildings were connected through high-speed fibre-optic cabling, with UTP cabling indoors providing access to 1,600 connection points. The choice of hardware was based on the compatibility of the new equipment with existing equipment. The cost of the fibre network and other related UTP was around US\$ 1,500,000 for the equipment and does not include labour for installation.

The three campus sites are linked through leased telephone lines. This network is fully integrated with the new telephone system (700 units) that was established under the project. The university owns the ISP and pays a concessive sum of US\$1,000 per month for unlimited use of the facility.

Software: Informix DBMS is used as the application development tool. The Microsoft suite is widely used on campus for productivity enhancement with isolated use of Lotus suite. Other specific software is used for specialised needs within the faculty. For example, for administrative and financial systems, the network is used as the platform on which a new 'Student Records System' (developed in-house) and a new 'Financial System' (acquired on the market) are now running.

Donors were the main sources of financing of the hardware and software.

Main results

E-mail and Internet have become the heart of a lot of the UNZA activities. The CAMAS network is the hub for a wide range of activities of the university. The fax and phone can be down for days or even months, while nobody really cares. But the moment the system is down, all hell breaks loose.

Based on the experiences with the development of CAMAS, UNZA has been able to establish the commercially operating Consultancy and Training Unit (CTU). CTU offers a wide variety of ICT training courses, assists with system implementation, and advises on network development. The CTU has a growing number of customers, ranging from individual clients to partnerships with major clients such as foreign embassies. A recent assessment concluded that CTU can function successfully as a commercial venture.

ICTs have been included in the curriculum of the new Department of Information Studies. They have also been accepted as a tool in teaching other subjects and in developing distance education. The Department of Computer Studies has been set up within the School of Natural Science, and in the nine provincial areas across Zambia computer centres have been set up.

CAMAS has assisted in the development of an institutional Information Services Strategy, and in translating the institution's ICT plans into concrete project proposals. Furthermore, the computer centre has assisted in supplier (cabling and equipment) negotiations and contracting (the centre also took the responsibility in case equipment in the region was not available or extremely expensive, and hardware and software needed overseas acquisition and shipping) network configuration, following cabling and equipment installation on-the-job as well as course-based training in network maintenance and management requirements specification, selection or design and development, and implementation of administrative and financial systems process of devolution of administrative and financial authority designing and tendering for a company-wide telephone system.

The successful implementation of a staff productivity assessment scheme has proved effective means to stop the brain drain of essential staff to private sector employers.

Keep in mind

Change management

The biggest challenge faced was the lack of preparedness for change management. Organisational change – especially the decentralisation of the financial authority to the schools – proved a bigger challenge than the technological (ICT) innovations. The reluctance to change is still hampering the effective implementation of CAMAS.

In retrospect the organisation's capacity for change in general could have been assessed more realistically. As change management is now considered as a decisive factor for success for CAMAS, UNZA is now using consultants to submit tenders to carry out this task, as the UNZA itself does not have the expertise to carry out such an exercise. Additionally, it is safer to have an outsider review operations for transparency and objectivity sake.

Stopping the 'brain drain'

One of the main challenges of all non-profit institutions that set out to develop ICT capabilities is to stop the brain drain and prevent 'poaching' of skilled staff by the private sector. CAMAS managed to drastically reduce the flow of staff to competing employers by training staff members in the region and on-the-job. Additionally, the computer centre introduced a bonus scheme for critical staff members. An unexpected benefit is that staff feels professionally more appreciated as a result of the implementation of this assessment scheme. The number of staff going to the private sector has virtually come to a halt.

Finances

The funds for CAMAS activities are generated by the consultancy and training activities carried out by the CTU. Students have free access to the facilities for project work, but they pay a minimum of US\$1.00 for 30 minutes works on the facilities for private Internet services. However, sustainability of the ICT investments made under the project is very insecure due to the financial problems the UNZA is faced with. To prevent financial instability, mechanisms have been put in place within the centre to cater for this. One of the ways used is to have an investment account where all profits are banked for the rainy day. So far the money has been very useful indeed.

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Using Computers in the Classroom in Jamaica

JCSEF is supporting a countrywide operation requiring the building of capacity, monitoring and the introduction of ICTs at all levels, using four nationwide clusters of primary schools.

Introduction

The Jamaica Computer Society Education Foundation (JCSEF) was established in 1990 by the Jamaica Computer Society to place computer labs in secondary and tertiary schools, in an effort to facilitate students taking examinations in Computer Science. Subsequently, the mission was expanded to incorporate *'the use of information technology to improve the quality of education and its contribution to national development'*.

By 1991 the Jamaica 2000 project (J2000) was implemented with the aim of placing the technology in all 166 secondary and tertiary institutions by the year 2000. The HEART (Human Employment And Resources Training Trust) input provided counterpart funding to contributions from the schools themselves, the community, school alumnae, businesses, education foundations and individuals. So far they have been able to install 128 Jamaica 2000 Labs in schools across the island, which have been broken down into the following four categories.

- Secondary: 84
- Tertiary: 19
- Primary: 22
- Vocational: 3

The overall objectives of the project are:

- Improving the quality of computer science education;
- Facilitating the provision of IT-based tools;
- Assisting in the development of curriculum which includes the use of technology;
- Promoting the use of IT in teacher training experiences and methodologies;
- Influencing government policy on the use of IT in education.

Information

The core of the activity is providing information for school children, adult literacy and teachers training through new technology. The planners of the project, in determining how best to introduce the technology, felt it would be beneficial to primary schools, if they could work with schools that had already been exposed to the technology. Primary schools were therefore chosen in four clusters in geographic proximity to secondary and tertiary schools that had already been introduced to the technology through the J2000 programme. The clusters varied in size, location and mix of primary, secondary and tertiary level institutions (with respectively 4, 6, 7, and 13 institutions in each cluster).

From the outset, the schools in the clusters were involved in its development and meeting regularly at various levels; principals, teachers, lab technicians, technology coordinators and students. Training was done with participants from all clusters together, as well as in individual clusters. A few teachers were trained as trainers. Several technology-related project ideas, teaching/learning interventions and community-focused programmes have been initiated in these clusters, with varying degrees of success. In particular, the business sector is being encouraged to work with the schools in providing curriculum guidance, work-study activity and summer work for students. This fosters the development of curriculum geared towards the economic activity of the community.

The clusters have provided an avenue for distributing the workload of the central administration. Regular meetings are held with cluster leaders to monitor progress and identify areas of support required. The clusters have already found creative and varied ways to ensure steady growth in the central cluster fund, thus ensuring sustainability of the programme.

Centres of Excellence have developed with the natural propensity to expand outward to encompass the entire island over time. Thus the clusters, under a general operating framework, have evolved into viable community-based and supported entities, through collaborative activities initiated and managed by a localised team of cluster leaders and other participants.

Communication

Community members were encouraged to participate in the construction and development of the laboratory infrastructure, giving sweat equity and know-how as well as monetary contribution. Businesses were encouraged to work with the schools in developing projects and in providing work-study programmes and summer employment. Community members continue to take advantage of the evening classes offered by the schools to upgrade their own knowledge and skills in the technology, and the schools are providing the communities with their publishing needs like birthday cards, wedding invitations, flyers and programmes. These activities provide the schools with much-needed funds to help in the maintenance and operation of the laboratories.

Cluster leaders also formed part of the project implementation team, which – lead by the JCSEF – included representatives from the Ministry of Education and Culture (MOEC) and the consultants assigned to the project, meeting regularly and reporting on the developments in the clusters and sharing ideas on enhancement possibilities. The leaders also provided a conduit for disseminating information to the cluster schools, and for bringing burning issues and concerns to the attention of the MOEC and the JCSEF.

The performance of these clusters was evaluated in terms of eight distinctive elements of cluster development, for which performance criteria were established:

- Technology leadership (personality, drive, motivation, creativity, involvement);
- Technology intervention (quality & quantity of project activities, including training);
- Cluster activities (efforts to use, improve, upgrade and maintain the technology);
- Resources and support (quantity & quality of resources and support systems developed);
- Collaboration and networking (evidence of meetings, and other interchanges, joint projects);
- Curriculum integration (level of integration of the technology in the school curriculum);
- Adult education and training (number of technology trained persons in schools and communities);
- Transfer of knowledge and expertise (the multiplier effect that the training provided).

The results varied overall from a low of 61% to a high of 89%, showing fairly good performance in terms of the expected output. There is also strong evidence to support the perception that the cluster concept has great potential for being effective as a mechanism for organising, managing, and collaborating in technology interventions and in the delivery of technology-based instruction.

Technology

Each cluster cooperated and collaborated in determining the site of the Cluster Software Resource Centre, in selecting the software and raising funds for the purchase of the computers. The clusters have also sought to conduct joint fundraising activities, to share resources – such as lab technicians – and to stage cluster exhibitions to showcase their achievements.

The software packages being utilised are: Autoskills, CCC and JLC. All contain programmed assessments as a part of the applications. Software has been identified that will form the basis for new libraries that will be placed in cluster centres.

If the IT teacher is not present, the lab is closed. Moreover, regular classroom teachers lack the expertise to assist students with their IT problems and there is an issue of when and how to share knowledge between the IT teachers and the lab assistants.

Main results

Initially, some 450 teachers were trained by the JCSEF from 1991 to present. 65 Teachers have been trained throughout the cluster, 90 J2000 teachers and 10 'territorial education officers'.

The JCSEF is now concentrating on training subject teachers in the use of the technology in instructional delivery and in integrating it into the curriculum. Around 60 teachers are pursuing a Certification Programme, 30 of whom are expected to become Trainers of Trainers.

The Ministry has requested World Bank assistance to produce a report on the role of technology in education in Jamaica. The Ministry will seek modest funding to support this study. The study is especially timely as the IDB, the World Bank, and USAID are now considering future investments in the education sector in Jamaica.

The government has expressed interest in receiving assistance from World Links for Internet training and other assistance. The government plans to send an invitation to the World Bank to participate in the mid-June meeting to discuss future education sector strategy in Jamaica, in the context of the general education strategy set forth by the Bank at the recent 'Summit of the Americas' held in Chile.

The Ministry of Education has expressed interest in replicating the project in other locations in Jamaica, taking into account lessons learned under the project.

IDB Projects in Barbados, El Salvador, and Colombia are employing features of the project and lessons learned.

Keep in mind

Integration

The project is basically an IT project and not one that assists in the implementation of IT as an integral part of the curriculum. Although the potential exists, for example, to download material from the Internet (where it is available) for use as supplementary material in various core curricula. The cluster concept has proven effective in unifying rural communities educationally through the use of educational technology and linking teachers' colleges to their school systems.

Cluster concept

The special features of the project that are innovative include: the cluster concept, its experimental nature, CAI-piloting and educational software evaluation.

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LIVELIHOOD OPPORTUNITIES

E-commerce in Ejura, Ghana: What has a Farmer got to do with a Computer?

One of the most frequently asked questions regarding ICT's relevance for developing countries is 'What has a farmer got to do with a computer?' This project from Ghana shows how ICTs can support small and medium farmers to increase their revenues and improve their farming practices by enabling them to access information on regional market developments and international agricultural know-how.

Apart from showing the potential of ICTs, it also shows the potential of the farmers themselves as main leaders of the information services. After participating enthusiastically in several training sessions, producers and traders alike now spend several hours a week on the computers to practice their new skills. In fact, most can hardly wait for the moment their sites are hosted on the Internet and they can finally contact regional and international information sources.

The initiative involved all major public and private stakeholders in the development and implementation of the project. Thus, people as different in power and function as the 'Market Queen' and the local representatives of the Ministry of Agriculture, are now closely cooperating with farmers to solve the main problem of small and medium producers: marketing.

Introduction

The Ghana Ministry of Food and Agriculture (MOFA) has been promoting the non-traditional agricultural exports. However, at the same moment that the Ministry is promoting the production of non-traditional goods, the producers of these goods encounter major problems in marketing their produce. As they lack the necessary information on market developments, farmers either have to sell their produce at prices far below their production cost, or risk having all their products going to waste.

Take the story of Ejura as an example. Ejura is a farming township in the Ashanti Region of Ghana. The Ejura farmers produce maize, yam and vegetables. In 1991 some produced garden eggs (eggplants). When traders from the south came, they first bought all their produce, and then advised the farmers to cultivate more garden eggs because they were good for exports. By the following year, most of the farmers in the area cultivated garden eggs, but the traders informed them they could not buy all their harvest. The farmers were forced to sell at a very low price, and suffered considerable losses.

To avoid similar things to happen in the future, MOFA initiated the set up of the Special Business Development Unit (SBDU) in 1998. The main objective of the SBDU is to efficiently promote Ghana's non-traditional export products in the regional and global market by improving contact between the farmer and his markets. Through the Unit, transactions will be done electronically, eliminating excessive travels and also fraud.

The project has the participation of farmers, local government officials and local market authorities, in order to assure sustainability of the Unit. The first (pilot) phase aims at training the main actors in computer and Internet skills and to set up two information centres in the districts Techiman and Ga.

The second phase started in October 2000, with the official opening of the first self-made Internet website and had to prove that farmers and ICTs match well.

While the main beneficiaries – the farmers and local traders themselves – have invested their time and knowledge in the project, the International Institute for Communication and Development (IICD) provided for the start-up capital, amounting to US\$50,000.

Information

Producers and exporters of non-traditional goods depend heavily on demand and supply developments on regional and international markets. Therefore, accurate information about product prices and demand levels is a primary necessity for sound farm management. The SBDU sets out to make international information on markets and prices available to the local farmers, thus not only allowing them to react to these developments, but also to negotiate as equals with the traders of their produce.

In order to facilitate the farmer's role as a trader of his own harvest, the SBDU will provide the farmers with the possibility to be in direct contact with other market agents. This allows them to enter in direct negotiations with consumers, but also provides them with an opportunity to handle their own shipping and other marketing activities, such as processing or drying their products. This could add considerable value to their products.

Communication

At the National ICT Roundtable Conference organised with support from IICD and the Ministry of Communication (MoC), a number of ICT project ideas were developed. Among these was the creation of an effectively managed website to support the non-traditional exporters, as basis for experimenting with electronic commerce in the country.

After a feasibility study, meetings were held with the paramount chief of Techiman traditional area and his elders, with MOFA District Director, the Farmers Representative, and the Market Queen, the managerial staff of classic FM, the District Chief Executive and the deputy regional Minister for the Brong Ahafo region (also the MP for the Techiman area). This phase has been important, as it created a positive feeling of cooperation between the different parties. They decided to start a pilot project in May 2000.

The pilot focussed on training the project staff in database management and farmers on ICT applications. They will also develop their own website to show their produce and promote their activities on the web. After the development of a MOFA website, the available information will be shared with other districts in Ghana.

The main communication channel during the first phases of the project was face-to-face. Visits cannot only help in explaining the process but also make the people involved more comfortable in voicing their requests and desires. Then e-mail will follow.

Technology

The following investments in hardware and software are planned: 1 file server, 4 desktop computers, 2 notebook computers, 1 printer (laser), 1 printer (colour), 1 UPS, 1 5KV stabiliser, 1 scanner, 1 digital camera, 1 CISCO routers, 2 Cylink modems, and 1 cross country vehicle.

As for software Windows NT 4.0 server (50 user), Oracle 8.0 Workgroup Server (50 user), Utility tools (Antivirus, etc), Microsoft Office 97 will be used. The choice of the equipment was made with professionals keeping in mind the expected growth of the users base and technical service to be provided.

Today, computers with accessories and Internet access have been installed in each of the two pilot districts.

Main results

Eight producers and traders have been trained in ICT in the Techiman District, and five in the Ga district. Also, project staff has been given extensive training in web development and database management.

Just before the start, some people were very pessimistic about the success of the project. Their main concern was whether the producers, who are only interested in their farms, would be interested in this system. Some were asking: 'What has the farmer got to do with the computer?' The interest shown by the producers and traders especially in the training has surprised most of the critics. Now the producers and traders spend at least two hours every week on the computers practising what they were taught at the training. They are all very optimistic and are awaiting their first contacts when their sites are hosted on the Internet.

Things to keep in mind

Sceptical local authorities

One challenge that the project faces arose when meeting one of the local authorities: the Market Queen. The Market Queen was sceptical, she claimed there have been a lot of projects where people come to collect information from them, but they don't hear anything in return afterwards. She was assured that this time, the information collected would be processed and utilised in the district. It was also made clear that they were going to be directly involved in the implementation of the whole process and that two representatives from the farmers' and the traders' groups with some appreciable level of education would be trained in IT (Introduction to Computers) so that they can be directly involved in the project.

Sustainability

The project is very particular about sustainability, so various communities have been made responsible for the whole project. E-mail accounts and other services will all be paid services, though at subsidised fees. So the communities are responsible for the day-to-day activities of the project. They also have full access to the computers. Due to the given responsibilities the communities now see the whole project as 'their Project'.

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The Virtual Souk: E-Commerce for Unprivileged Artisans

On the one hand, the experiences of the Virtual Souk show how the surge of e-commerce can create opportunities for small artisans living in remote areas. ICTs enhance their trade and the conservation of their traditional knowledge. On the other hand, by pioneering in this unknown field of e-commerce between small producers in developing countries and the potential demand of high-income markets, the Souk also tells us about the potential pitfalls and the obstacles that others will have to deal with if they start similar initiatives.

Thus, whereas the Souk is certainly replicable in other countries and other sectors, it urges new initiatives to be aware of the costs of marketing and the need for quality control.

Introduction

Artisans from the Middle East and North Africa region have always crafted high quality products using traditional techniques and ancestral know-how. Today, their knowledge is disappearing and their incomes are lagging. This is not only caused by shrinking local demand and the distance to lucrative national and international markets, but also by limited access to information on these markets and a lack of ways to communicate with them.

The main goal of the Virtual Souk is to bring artisans crafts to the market place, without pressure to standardise and degrade their techniques. Thus, by returning the profits to the artisans without high intermediation costs, the Souk will not only increase the livelihood opportunities of the artisans, but will also help to save their high-quality techniques.

In January 1998, several activities led to a financially sustainable, decentralised and locally controlled e-commerce operation called the Virtual Souk. These activities represent a combination of awareness raising, capacity building, network strengthening, and the expansion of use of new information technologies.

Information

The type of information that is the core of Elsouk's activity is a user-friendly and multi-lingual Web database catalogue of products and artisans from the Middle Eastern and North African region (MENA). As the marketing of the products is the main challenge, Elsouk tries to provide the artisans with the information that used to come to them through the middlemen/traders of their arts and crafts. The Souk provides artisans with timely market feedback regarding their products and the new trends.

As the traditional channels for sharing technical skills between one generation and the other are rapidly disappearing, a vast amount of know-how and a possible source of wealth are vanishing. In order to enhance the preservation of the artisan's know-how, the Souk provides their crafts with a marketplace, without pressure to standardise and degrade their techniques, and returns the profits to the artisans without high intermediation costs. This can help save these high-quality techniques, provide much improved income to poor artisans, and provide opportunities for the artisans to organise themselves to meet market demand.

After a group of artisans is explained about the Virtual Souk and is interested in joining the market, a catalogue of approximately ten objects from each artisan is identified, and the products can be sold on the virtual marketplace.

Communication

The Virtual Souk is a service to local development NGOs engaged in the promotion of income generating activities at the grassroots level, whose outcomes vary depending on the partner. Thus, the initiators of the Souk communicate with groups of artisans or NGOs to raise awareness and build their capacity to partake in the Souk.

To start building up a contact, the traditional approach of face-to-face communication is still the best way. Once good contact is established between the artisan and the Souk, the new partner uses the e-mail address that the Souk opens for him or her. The Virtual Souk provides its partner NGOs and artisans training in for example Internet, ecommerce, marketing, basic management skills and micro-credit. Thus, the Souk is trying to assure that all vendors possess the necessary expertise as far as logistics (timely delivery, packaging) is concerned.

To attract and maintain an Internet audience and connect the demand for arts and crafts, the Virtual Souk links major Middle East and North Africa websites (targeting the Middle Eastern Diaspora), key international agency sponsored websites and special commercial websites (when relevant). Also, by its Press and Media programme the Virtual Souk has featured in widely distributed newspapers, magazines and newsletters such as Le Monde and Elle.

Technology

The Virtual Souk relies on a decentralised electronic catalogue of artisans and crafts based on a SQL database. Each participating NGO owns its respective data/information and is responsible for regularly updating its catalogue. Having gone through the process of the first step (described above), the marginal cost for the participating NGO to maintain the database and to perform the commercial and financial transaction, is relatively small and it is being met through a margin build into the final price.

The NGOs provide local financing for the hardware and software, so each participant has its own chosen equipment and software.

One of the major difficulties is the maintenance of the website, as professionals in this field are hard to find.

Main results

Approximately 1,000 artisans are trained and included in the project. Over the first two years, more than 1,500 clients visited the Souk. Artisans have grouped themselves and established quality criteria of their work and began collaboration among them. And the Virtual Souk organised three training workshops in Tunisia, Lebanon and Morocco.

Things to keep in mind

Economic risks

The major risk is the economic failure of this commercial activity, caused by low volumes of sales, less than expected involvement of the participating NGOs, or poor quality of the products.

Another difficulty is the logistics implementation that can be costly (shipping) or non-existent. In addition, governments in the region are suspicious about increased connectivity and have the tendency to control the Internet. However, several built-in measures, such as predicted growth, working with reputable NGOs, quality control of the catalogued products and raising awareness through participating in fairs and forums, can mitigate these risks.

Professional members

In order to maintain high quality standards and reliable services to the clients, all participants of the Souk have to receive training in managerial, logistic and technical skills. Without the guarantee of sound services, the Souk will not be able to sustain a sound relationship with far-away markets.

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Trade Point Senegal

Trade Points are a means towards the improvement of trade efficiency. As these 'TPs' are being formed all over the world, they help to build a strong private sector in any country by making investment and advertising easier and by providing readily available market information.

Trade Point Senegal (TPS) is one of the first countries to decentralise its trading point services to local levels, by choosing the local Chambers of Commerce and rural community offices as its natural counterparts.

TPS has developed four basic tools that support the provision of trade services. These tools target different groups – institutions, traders and potential employees – and are partly developed by Senegalese professionals.

Introduction

The idea of Trade Points originates from UNCTAD VIII (1992) and the Ohio symposium on Trade efficiency (1995). The mission of Trading Point Senegal is to give the country the means to actively participate in globalisation through an ICT infrastructure that facilitates trade and contributes to the growth of Senegalese exports.

In the Trade Point, all trade supporting facilities are grouped together under a single physical or virtual roof to provide all required services for trade transactions.

Trade Point Senegal (TPS) started functioning in 1995. Since July 1999 a programme of decentralisation of its services has started in order to allow for a more diverse group of traders to accede to TP's services. The regional antennas are under supervision of TPS Dakar, but their management is autonomous.

Information

Trade information, an automated foreign trade formalities system, electronic payment of duties and information about how to set up a business in Senegal, are part of the information given to local and foreign traders who have access to TPS. TPS has four tools to achieve its mission: INFOCOM, ORBUS 2000, the Electronic Job Place and the Incubator. INFOCOM and ORBUS 2000 allow for a significant reduction of the transaction costs of foreign trade.

INFOCOM gives Senegalese traders the opportunity to benefit from new technologies within the scope of their business, without the need to invest in equipment or to have technical know-how. The device is simple: young, dynamic and able staff is entirely at their disposal to handle all their expectations through the system of electronic trading information. After less than a full years operation, already more than 500 Senegalese trading operators used this network to sell their products or search for partners, of which more than 50% had serious business connections. The traders can also access the full assistance service composed of: documents translation, electronic mail and websites hosting, national and international market surveys, information research and various personalised services. In order to increase Senegalese companies' visibility, INFOCOM includes a team of web designers to create websites for companies, providing them with the opportunity to promote their products at an international level, without being obliged to publish bulky catalogues. About a hundred companies have already trusted Trade Point for this service.

ORBUS 2000 is an electronic tool that connects public and private structures involved in the collection, processing and control of foreign trade documents. Thus, it sets out to improve procedures and reduce customs operations delays, improve methods and working conditions of all participants, reduce transfer and collection time of documents and speed the payment of taxes, stamps and merchandise collection fees. ORBUS makes it easier for traders and institutions to perform all trade formalities according to three stages:

1. Establish the electronic connection between the trader and the institutional framework of import and export deals. The system has a device that is able to identify the requested administrative network according to the selected request.
2. The ORBUS 2000 switchman sends the information on the proposed trading deals to all interested public services to speed up the processing and issuance of required permits and stamps. These processed electronic documents are filed and put at the applicant disposal through the ORBUS 2000 network.
3. The third stage consists of introducing the customs declaration, and leads to the electronic routing of the documents within the customs house.

ORBUS 2000 will also ease the electronic payment of duties. As the Treasury Department shares a secure network for their deals with commercial banks, the users can give orders to their bank for the payment of duties relating to the declaration.

The 'Electronic Job Place' was initiated in 1999 after TPS's participation in the Youth Employment Fair. It allows young people to post their résumés on the Internet and be contacted by national and international firms.

The 'Incubator' is an electronic commerce website with a possibility to buy directly. As it allows firms to get on the web and strengthen their e-commerce capacities to start their own sites, this website may be considered as a true incubator for e-commercial traders.

Communication

The TP in Dakar associated all stakeholders from the beginning. In fact, there still are as many participants as beneficiaries. Both traders and trade-related institutions provide the information distributed by the TPS and simultaneously use the TPS services.

To ensure that important niches of agricultural and fishery produce connect to the TPS via the decentralised antennas, a national campaign on commercial information through TV, radio and newspapers is scheduled. This action is needed urgently, as the results of the decentralisation are not as good as expected. The initial appraisal of the local audience's capacities has not been correct, causing discrepancies between the local TP's operating mode and the mostly rural and illiterate local population.

Technology

The main communications means between TPS and its members (businesses, local antennas, government, etc.) and partners are e-mail, fax and phone.

All regional antennas are equipped so as to insure full ICT services. Their equipment is composed of servers with modem, Pentium desktops, scanners and printers and UPC units. They all have

Internet connections. TPS Dakar is their provider. They can access the daily updated database to save on Internet connections. Dakar is the technical head office for all equipment problems.

The big challenge here is financial. Each antenna grosses about CFA 130,000 and spends CFA 373,000. Including the local subsidy of CFA 25,000, this leaves a deficit of 59% of the operating costs. On setting the different antennas, TPS signed a partner agreement with local authorities so the partner hosting the TP antenna would be responsible for electricity, water and security costs. The Dakar office is in charge of all equipment buying and installation, and recruitment of staff. Until now, UNCTAD and IDRC provide the essential funding for parts of the project.

Main results

Decentralised TPS's with full-fledged management committees, fully trained young ICT professionals and increasing interest from the local private sector and the local population in general.

Established partnership and functioning co-operation with trade-related government institutions, Chambers of Commerce and local community offices.

Between 1998 and 1999 more than 500 Senegalese traders were connected to potential trading partners in other countries. At least half of these contacts has proven sustainable, and are generating livelihoods through trade.

Things to keep in mind

Ins and outs of decentralisation

Despite the fact that the first regions selected for decentralisation are economically strong, the estimation of the local capacities to manage information was too optimistic. Thus, after a slow start of the local TP's, more active media and information campaigns are needed to make these decentralised posts a true link in the Senegalese electronic trading network.

The right choice of a local partner choice is essential. Experiences from Senegal indicate that the best counterpart is the local Chamber of Commerce. Rural community offices are very sensitive to political pressure, and therefore less likely to operate efficiently.

Matching products and information services

The commercial information currently provided by TPS does not always target the right type of products. The wider the network of traders is growing, the more diverse the offer of products becomes. Thus, although the right information would greatly support local people in trading their produce, the local services are still not able to respond effectively to all their demands for information.

Technical know-how

There is a serious lack of technical know-how, creating instability in the whole network system. Training of the day-to-day operating staff is key to a well-functioning, decentralised system of local and central TPs.

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Sustaining Women Farmers in Ukraine

The project shows that offering real access to information and allowing the exchange of knowledge and day-to-day experiences can significantly improve livelihood opportunities of women.

The consultation of the direct beneficiaries of 'Sustaining women farmers in Ukraine' has been a clear factor of success. By participating in the discussions, the women not only assured that the project met their needs and capabilities, but also came to know the potential of ICTs. Six months after initiation of the project, they are already applying this knowledge by training each other and by developing e-commerce initiatives.

A special feature of the project is that it includes the services of an expert, who assists the women farmers in their communications by eliminating language problems, and supports the development of a tri-lingual website.

The proposed network configuration is scalable in terms of the range of applications and content and scope of the network, as well as geographical range. Thus, it can be used as a platform to launch other initiatives, such as telemedicine, distance education, governance, environmental protection, and livelihood creation.

Introduction

Of all economically active women in the Ukraine, 79% is engaged in the agricultural sector. As in other parts of the world, they face more obstacles than male farmers do to access information about new laws and regulations and market developments. As rural women typically fulfil multiple roles – farmer, housewife, mother and entrepreneur – a better accessibility to information would significantly contribute to an improvement of their day-to-day living and working conditions.

The objective of this project is to improve the status of rural women in Ukraine, and to raise the quality of their lives and the lives of their families, in the context of the transition from a fully collectivised agricultural sector to a market economy. Since 1999, eight telecentres have been created. Through these centres, ICTs support Ukrainian women farmers to become successful entrepreneurs in a new market economy.

The project is an initiative of the UNDP, in collaboration with the Ukrainian Council of Women Farmers and the State Committee of Ukraine for Entrepreneurship Development. Having started on the 1st of June 1999, it will run until mid-2001. Total funding is about US\$ 500,000.

Information

The deeply felt need for information access and the use and sharing by women who live in rural areas, triggered the 'Sustaining Women Farmers in Ukraine' project. As information needs vary significantly, the project creates telecentres that provide access to the following types of information.

- Information on the frequently changing laws and regulations related to taxes and land holdings: up-to-date information will greatly facilitate the acquisition of new land, and thus the economic position of the women farmers.
- Information on market developments, such as commodity prices, prices of equipment and of

fuel and fertilisers: this improves their position to negotiate the prices of their produce with middlemen and on the streets of Kiev. An increased knowledge on the day-to-day shifts in supply and demand could contribute to an increase of their income level.

The telecentres also cater to the women's needs to exchange information through frequent communication and networking. Now, general know-how of farming techniques and farm management, as well as best practices on available equipment, can be actively shared between the women farmers.

Apart from learning through each other's experiences, it strengthens their feeling of belonging to an important stakeholder group. This enables them to lobby effectively for measures that allow them to operate under equal conditions as other economic agents in the agricultural sector.

Communication

An extensive consultation with the women farmers and other key stakeholders has been a factor of success. It allowed for the successful integration of IT into the women's daily lives. Although some of them had never surfed the Internet before, most of the women farmers were aware of the information revolution and the potential of ICTs. Thus, it was relatively easy to discuss the project idea with them.

Consultations revealed that both the lack of access to information and the lack of effective communications and networking tools prevent women farmers from sharing, analysing and comparing experiences and good practices among themselves. After identifying these needs, discussions were directed towards the more practical issues of the project, to assure that project activities would not interfere with the overall activities of the female agriculturists. As a direct result, training needs were identified and were organised in such a way that they would not take place during the agricultural season.

By including other stakeholders, such as administration officials, private companies and academic institutions, the consultations also resulted in a steady increase in the level of cooperation between the women farmers and local authorities. This steady increase in the networking capacities is also supported by the fact that the telecentres provide computer and business training to government representatives. Thus, the centres are becoming a vehicle; they provide ample opportunities to meet government representatives and discuss with them ongoing problems and possibilities for closer co-operation.

Currently, an expert assists the women farmers in communications and content creation for their website. This arrangement will eliminate the language problem and at the same time enable women farmers to receive relevant information in a systematic and structured manner.

Technology

The details of the network configuration were determined through a series of consultations involving UNDP, the Council of Women Farmers and public and private sector representatives. They proposed a network that has a potential for scalability in terms of the range of applications and content and scope of the network, as well as for the geographical range. Thus, it can function as a platform to launch development applications, such as telemedicine, distance education, governance, environmental protection, and livelihood creation.

The software and hardware configuration was determined with local technical experts, taking into account their experience and the most popular applications in the country. The computer network consists of a server located in Kiev and eight computers connected to the Internet in the designated telecentres. As for equipment, there are Pentium Pro servers, computers and a scanner, with Windows based software.

Main results

Within six months after the official start of the project, already more than thirty women farmers had acquired or increased their land holdings.

Since the establishment of the eight centres and the completion of the first round of training, women farmers are taking the initiative in the use of the computer network and have started the creation, collection and dissemination of useful information by themselves. Some centres started the creation of databases on fuel, pesticide, agro-chemicals, seeds, credit lines and agricultural machinery. One of the databases they created is dedicated to the information on the farms run by women farmers. The number of registered women farmers is increasing by the day.

Women farmers are applying their newly acquired skills to elaborate and disseminate documents among themselves in the process of the establishment of the cooperative.

The project set-up is inspiring others, and replication is being initiated in China and Laos, while UN agencies in other countries have expressed their interests in some of the concepts.

Keep in mind

The need for translations and continuous linguistic support

Due to the multilingual nature of Ukrainian society and the intention to engage in networking with foreign entities, there is a clear need for a Ukrainian, Russian and English tri-lingual website. The availability of information in Russian and Ukrainian is pivotal in guiding and advising women farmers in negotiations and communications. In order to cater the ongoing need for tri-lingual translations, a part-time language specialist will be translating Ukrainian information to the world, and crucial agricultural know-how from the world to the women.

E-commerce

Women farmers react enthusiastically to their sudden access to international markets. They are expanding their contacts through the Internet and by using e-mail. To support their effort to tune in to the free market economy, the project is organising online training on content creation and e-commerce. The trained women will be able to set up online stores and promote new products beyond the national boundaries, thus overcoming the limits of their existing markets and taking advantage of the benefits presented by the globalisation.

Favourable conditions help

One of the advantages that seem to be of high relevance to the successful evolution of this initiative is the fact that the Ukrainian women have relatively high educational levels. Thus, training costs were relatively low and the integration of the women in the preparatory consultations and the implementation of the project could proceed smoothly.

Financial sustainability

The project provides the key components of the computer network, such as computers, modems and software applications. However, through local branches of the Council of Women Farmers, the women pay all other expenses themselves. Once established, it will be the Council that will maintain and expand the computer network. Continuous sources of finance are the fees that the telecentres charge for various services rendered to individual, private and institutional users. Additionally, sponsorship for the website and subscriptions by private sector companies might prove a solution to the issue of financial sustainability. Likewise, trained women could offer services in website creation and in the hosting to local small and medium sized enterprises and charge for these services.

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IICD PROFILE

The International Institute for Communication and Development (IICD) assists developing countries to realise sustainable development by harnessing the potential of information and communication technologies (ICTs). The driving force behind IICD activities is that local 'change agents' themselves identify and develop proposals for realistic ICT applications - local ownership forms the essential basis for sustainable socio-economic development.

Acting as a catalyst, IICD's three-pronged strategy is mainly delivered through a series of integrated Country Programmes.

First, IICD facilitates ICT Roundtable Processes in selected developing countries, where local stakeholders identify and formulate ICT-supported policies and projects based on local needs.

Second, working with training partners in each country, Capacity Development activities are organised to develop the skills and other capacities identified by the local partners.

Third, IICD draws on its global network to provide information and advice to its local partners, also fostering local information exchange networks on the use of ICTs for development. The best practices and lessons learned are documented and disseminated internationally through a Knowledge Sharing programme.

In support of these activities, IICD invests in the development of concrete partnerships with public, private and non profit organisations, thus mobilising knowledge and resources needed by IICD and its local partners.

Country Programmes are currently being implemented in Bolivia, Burkina Faso, Ghana, Jamaica, Mali, Tanzania, Uganda and Zambia.