The Lighthouse Project in Nang Rong, Thailand is connecting farmers, school children, factory workers to the Internet.
See page 27

The vast R&D information resources of Indonesia has been unlocked by the Indonesian Digital Library Network.
See page 13

PAN ASIA ICT R&D

Brief review of research funded by the PanAsia RnD Grants Programme

Nepal adopted a participatory process for formulating the country's IT policy and mobilising people towards its implementation.
See page 17

E-marketers of South India are making brisk sales of craft ranging from sarees and bags to stone sculptures and bronze figurines.
See page 9

The projects featured
in this publication were
supported with grant awards
approved by the

ICT R&D Grants Programme Committee

which served from
May 1997 to January 2002

Dr. P. K. Abeytunga
Canadian Centre for Occupational Health
and Safety

Mr. Shahid Akhtar
UNDP Asia-Pacific Development
Information Programme

Dr. Amelia C. Ancog
National Research Council
of the Philippines

Dr. Tony T. N. Hung
Hong Kong Baptist University

Mr. Renald Lafond
International Development
Research Centre

Ms. Maria Ng Lee Hoon
International Development
Research Centre

Dr. Randy Spence
International Development
Research Centre

Mr. Paul Wilson
Asia Pacific Network Information Centre

The Honourable
Mr. Justice George Yates
The Supreme Court of Ontario

Mr. Stephen Yeo
Singapore Computer Systems Limited

Prof. Muhammad Yunus
Grameen Bank

" I got the idea of setting up an e-commerce site when I attended a Pan Asia Networking workshop. "

Santosh Narayanan
Staff member coordinating
FOOD's ICT initiatives

" We plan to adopt parts of the ITB Bandung software for our network in Penang, Malaysia. "

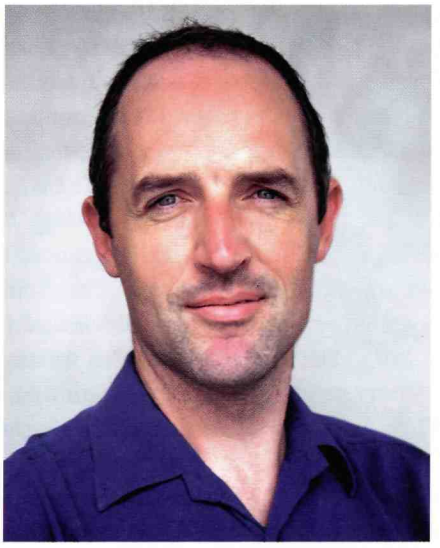
Rosnah Idrus
Computer scientist
Universiti Sains Malaysia

" I refer to Beijing Farmknow to get ideas on what to grow on my farm and to get scientific advice on how to control plant diseases. "

Zuoying Li, Farmer
Shunyi Vegetable
Production Base, Beijing

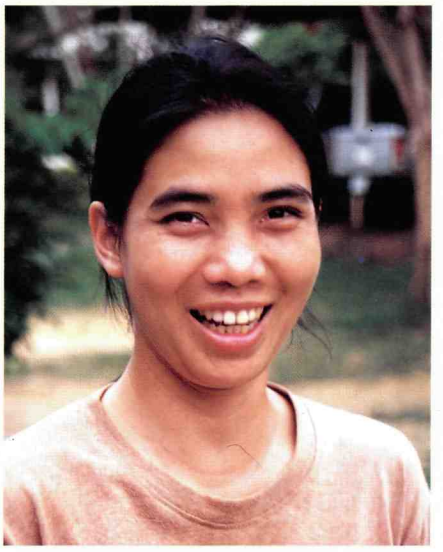
" Once we were able to get VSAT we were able to get bandwidths 20 times cheaper . . . cost has come down 30 to 40 fold for the users. "

Dileep Agrawal
Founder and President
Worldlink



" He encouraged Asian voices in the international debate on domain names. "

Paul Wilson
Director General
Asia Pacific Network
Information Centre



" My farmer-friends depend on me to get the price of rice from the Internet. "

Vanida Jumphimai
Factory worker and
rice farmer
Choakchai Village

The PanAsia RnD Grants Programme

Its underpinning concepts and aims

This regional information communication technology (ICT) competitive grants scheme was launched by IDRC's Pan Asia Networking (PAN) Programme Initiative in October 1997 as "The PanAsia RnD Grants Programme". During 1997-2001, the independent Committee that approves the awards for this Programme made 27 national-level grants for research projects in Bangladesh, China, India, Indonesia, Nepal, Malaysia, Sri Lanka, Thailand and Vietnam. A number of the grants have been awarded to regional bodies located in the Philippines, Singapore and Thailand. They total 1.8 million Canadian dollars.

School children in Nang Rong, Thailand who enjoy Internet access via the Lighthouse Project, shown here with their teacher and PAN partner

Six examples of innovative efforts

This publication tells the story of what six of the Programme's awardees have accomplished in their work with their target beneficiaries. They are examples of imaginative ideas of Asian researchers, who have innovated development work by applying new ICTs and devoted time and energies in field-testing their concepts through the building of model systems. Some of these projects have won international recognition awards. For a complete listing of the projects supported by the Programme visit our website:
http://www.PanAsia.org.sg/grants/awards/

We have just completed a comprehensive review of the Programme, inviting feedback from the Programme's multiplicity of stakeholders about their views on various elements of the Programme's processes and results. A brief summary of what they told us, is available on the next two pages of this booklet.

We have chosen to disburse a portion of our grant funds through the competition modality in order to widen the channels through which we reach prospective clients and partners. We were also looking to learn from the grants applications received by us, the ICT needs of the region. This method allowed for built-in feedback about the fast developing ICT field and alerted us to changes required in our programming.

The grants are not big; they serve to provide opportunities for problem-solving by least developing country organisations that can produce quick results. For many institutions, it was their first attempt at submitting a project proposal application and winning a project grant. The Programme aims at providing a sustained, open and flexible mechanism for encouraging these institutions to identify specific instances in which ICT-related intervention, whether in Internet-based applications, systems or policy, can contribute to problem-solving for development. The competition is aimed at encouraging the identification of developmental problems where ICT can make a difference. It is also to encourage experimentation with ICT processes that can be maintained and up-scaled through the sharing of research process and results. Our concept underpinning the initiation of this semi-annual grants competition aims to:

- **Focus on applied research** involving innovative and experimental elements, but excluding infrastructure and development work that requires large amounts of resources.
- **Discover new institutional partners** for us thereby extending our network of partners.
- **Facilitate participation of experts from the region** in making decisions on project awards.
- **Discern patterns and trends** in the quickly evolving ICT needs of the region.

Evolving with new partners

The Programme has recently taken on a new title, "ICT R&D Grants Programme: Asia Pacific" with the participation and contribution of funds from UNDP's Asia Pacific Development Information Programme (APDIP). This important collaboration catalyses the evolution of the Programme to a broader ownership-base involving key national, regional and international agencies in the Asia Pacific region. We hope that the Programme can help to facilitate the pooling of resources among the organisations which share common interests in building capacity for ICT research and development in the region.

This booklet is produced to facilitate prospective partners' participation in the Programme.

We also hope that it will provide researchers in the Asia Pacific region with ideas of the opportunities that exist in the ICT sector, and encourage them to engage in research and development efforts to advance regional, national and local interests.

Pan Asia Networking (PAN) Programme Initiative
International Development Research Centre

Learning from our partners

Impact, benefits and role of the Programme

New information and communication technologies (ICTs) help to make good development projects even better. Such enhancements happen in a variety of ways. Farmers, for instance, can now make astute decisions on which crops to plant by referring to market information downloaded from the Internet (see page 27 for an example from Thailand). Their counterparts in China can quickly diagnose insect pests and plant diseases via easily accessible expert systems (see page 5). Indian parents in Chennai can now work from home giving them the opportunity to care for their young children (see page 9). And the Government of Nepal is able to post background papers and a draft policy on the web so that people who normally don't participate in public policy design can do so (see page 17).

Such benefits of ICTs and the PanAsia RnD Grants Programme emerged from an evaluation of the Programme conducted by Dr. Mohamed Ally towards the end of 2001. The evaluation reached out to all stakeholders, including both past and current recipients of grants, as well as researchers who had submitted unsuccessful applications.

The capacity-building goal of the Programme was widely appreciated as an important core-value of the PanAsia RnD Grants. All the researchers confirmed the increasing importance and strategic value of information to their communities. They also appreciated the urgency they faced of equipping themselves with the skills and tools for processing, retrieving and producing benefit from information resources and communication processes. One researcher commented: "The new technologies will change the lives of people who often take decisions without access to information. In agriculture, early access to market information will greatly enhance the growers to take the best options and adopt best practices."

Another researcher perceived a broader role for ICTs in promoting good governance: "ICT is the greatest contribution to a world ravaged by ethnic strives, small-scale wars, illiteracy, ignorance and opportunism. ICT should be able to make processes of government planning easier and better managed, and remove suspicions among the common people, stop high handedness of the petty officials, and remove a lot of bureaucratic mismanagement."

These encouraging attributes of the new technologies have not blinded the researchers to potential pitfalls. It was clear to them that the methodology for deploying ICTs to derive such benefits remains to be fully developed and refined. One other researcher cautioned: "There is an urgent need for Third World countries to understand the relationship between ICTs and development before they spend vast sums of money . . . disillusion will set in when they discover too late that technology of itself is insufficient for development to occur." This researcher's caution has been the Programme's message since its inception.

Emerging lessons

Some lessons are emerging from the projects funded so far which may help to establish and define the relationship between the new technologies and development. The researchers surveyed contributed the following specific roles and uses of ICTs in their development settings:

"Increasing the awareness of the people to share knowledge."

"Helping non-English speakers to access websites and send e-mails in their own languages."

"Facilitate the adoption of e-commerce in places where English is not in widespread use among the population."

"Help to research technologies that would empower rural women cooperatives."

"Enable NGOs in rural areas and rural artisans to promote their products worldwide using Internet e-commerce."

"Help students access learning-support."

"A web-based knowledge site to increase awareness among hospital staff to derive best practices in bio-medical waste management."

Dr. Ramesh Ananda Vaidya, Member of the National Planning Commission, Nepal and a project director

Strengthening capacities

Recipients of grants from the Programme said that they acquired skills and other benefits which place them in stronger

positions to make these vital connections between ICTs and development. The benefits include:

"Methodologies for conducting ICT sector research adapted to the local environment."

"More staff are trained to access and use national and international information networks. Thus, they are able to provide current and relevant information to local farmers."

"The two-country project enabled us to extend our research activities in other areas . . . This increased our exposure to other regional researchers working on common problems and facing similar constraints. These are critical inputs in planning for future projects."

"We enriched our experiences in fostering young agricultural scientists and extension staff in using ICTs as well as developing multimedia web-databases."

"The project has put our researchers in real life situations of promoting and persuading people who are not familiar with technology to use it . . ."

Teachers from Nang Rong, Thailand in their new computer-laboratory built with a special local government grant following their participation in a training course

Extended networking

Part of the relationship between ICTs and development starts with the researchers' personal relationship with other key members of the development community. Project staff reported that their work was helping to forge these synergistic relationships and extend their professional networking:

"As a result of the project, we have launched several other projects together with our local partners."

"Many organisations are now interested to join us. Now, more than 25 institutions have shared their knowledge . . ."

"Many agencies specialized in IT now have very good relationship with the project staff in terms of knowledge and information exchange, as well as cooperation to solve the same problems."

"We have had a global impact with this research project. An average of one international meeting or conference per month has been organised during the period of the project either independently or in collaboration with other partners."

"We managed to call on several agricultural research institutions in the area and met some very relevant institutions to collaborate on future endeavours . . . The PanAsia Network is a very good link-up."

"The PanAsia Telecentre Learning and Evaluation Group that was formed with similar projects in the region was instrumental in accelerating the learning that took place."

"We have established a steering committee comprising of . . . doctors, policy-makers, technologists, etc. for providing feedback to make the project more user-friendly and enhance its effectiveness and reach."

Catalysing related activities

Ninety percent of the people who took part in the evaluation said that the grants from the Programme became important seed funding to catalyse related activities such as: attracting local specialists to take part in project implementation, establishing collaborative ties with local and regional agencies, improving computer networks, extending e-commerce facilities, strengthening linkages with the academe, and extending research to other countries. This is what they said:

"The outcome of the project is actually more than what I expected. Initially, we wanted only to establish a digital library network . . . When we launched the software, people from non-research and educational institutions wanted to join the network. With a good design of the network, we can now plan to develop other sub-networks."

"We do not have core funds for collaborative or distance training . . . the grant enabled us to initiate activities for developing distance training capabilities using ICT in collaboration with other organisations."

"The funding allowed us to create an unprecedented global interest in the issues surrounding the needs of people who do not speak English as a native language, or even as a second language . . ."

The experts' perspective

The evaluation also invited the small group of regional and international specialists who served on the Programme's committee to reflect on the projects they had approved during their term of office:

"Locally-based and practically oriented nature of the successful proposals, which (when completed) will help to build up local networking capabilities and expertise, and indirectly lead to advances in knowledge and improvements to the standard of living."

"A few projects have developed effective and novel efforts that have transformed ICT work in Asian developing settings."

Abstracted and adapted from:
Mohamed Ally (January 2002) "PanAsia RnD Grants Programme Evaluation Report"

Project output

Research findings on farmers' information needs regarding vegetable production in the Beijing Region.

Beijing Farmknow website offering information on the following aspects of vegetable production: cultivation techniques, pest management, crop varieties, market information, and directory of experts. Altogether, 13 kinds of vegetable crops, 70 types of diseases, and 30 kinds of insect pests were covered.

Project outcome

Adoption of the revamped Bejing Farmknow website as one of the key components of the Beijing Bureau of Agriculture's e-government facility.

Dissemination and extension of various research results and technologies developed by scientists at the Chinese Agricultural University over the past 20 years to farmers in the country, particularly those within the Beijing Region.

Presentation of the project's experience to major agricultural universities across China.

Award received

The project "Applications of IT to vegetable production", which includes the Beijing FarmKnow system, won the Award for Scientific and Technological Advancement presented by the Municipal Government of Beijing in 2001.

Beijing farmers get innovative web access

Ding Ruiqi and his wife are successful small-scale vegetable farmers in Beiwu Village located on the fringes of Beijing. Ding's good reputation in horticulture led to an invitation from farmers in neighbouring Hebei Province for him to act as their advisor. On one of his visits to the Hebei farms, Ding was showed a small insect pest which he had not encountered before. He did what he would do at home in such circumstances. He logged on to the Beijing Farmknow website and researched the pest within the "Plant Protection" section of the website. "I discovered from the Farmknow website that it was a pest called the 'leaf miner', found out the way to control it, and taught the control methods to the farmers in Hebei."

Ding tracked down the leaf miner pest for the farmers in Hebei Province from this page of the Beijing Farmknow website

Beijing Farmknow is a modestly funded initiative which has delivered impressive results. "We wanted to start small to make sure we are doing the right thing," explained Prof. ZuoRui Shen, the project leader. Contrary to Shen's modest reply, the effort of his team is not small by any standards, even if the research grant his team received from PAN was just $16,500 CAD. What Shen and his team had done was to mount on the Internet, adaptations of various sets of computer-based content which his laboratory had developed over the past decade. One of these is *PestDiag*, an expert system for identification of insects found in vegetable plots, which farmer Ding had used in tracking down the leaf miner pest for his friends in Hebei Province. By building the Beijing Farmknow website, Shen and his team have

Project basics

Grant awarded:
$16,500 CAD

Grant used for:
- Purchase of a server, networking equipment, and software
- Reference journals

Supplementary grants from other sources:
- China Agricultural University: $12,000 CAD (In kind)
- Beijing Bureau of Agriculture: $4,000 CAD (In supportive services)

made available to the public important sets of scientific information accumulated by researchers at the China Agricultural University over the past 20 years. Information which farmers around Beijing, and other parts of China, have sometimes found crucial to their livelihood.

Perfect timing

Beijing Farmknow is a collaborative effort involving the Integrated Pest Management Intelligent Formation and Software Technology (IPMist) Laboratory of the China Agricultural University, and the Beijing Bureau of Agriculture (BBA). Shen is the head of the IPMist team, while the BBA team is led by Minghua Yang, Deputy Director General; Zhiqiang Tao, Director of Vegetable Division; and Xiaojun Yan, Director, Information Centre. The timing of the project was perfect. It succeeded in proving that the concept is sound just as the government began to emphasize the building of new e-government facilities to better serve civic and private sector groups. BBA has decided to support the development of a new, third version of Beijing Farmknow to be mounted on BBA's website as one main prong of its e-government facility.

Left to right: Li, project assistant director; Shen, project director; Zhiqiang Tao, BBA Director of Vegetable Division; and Xiaojun Yan, BBA Director of Information Centre finalising Version 3 of Beijing Farmknow

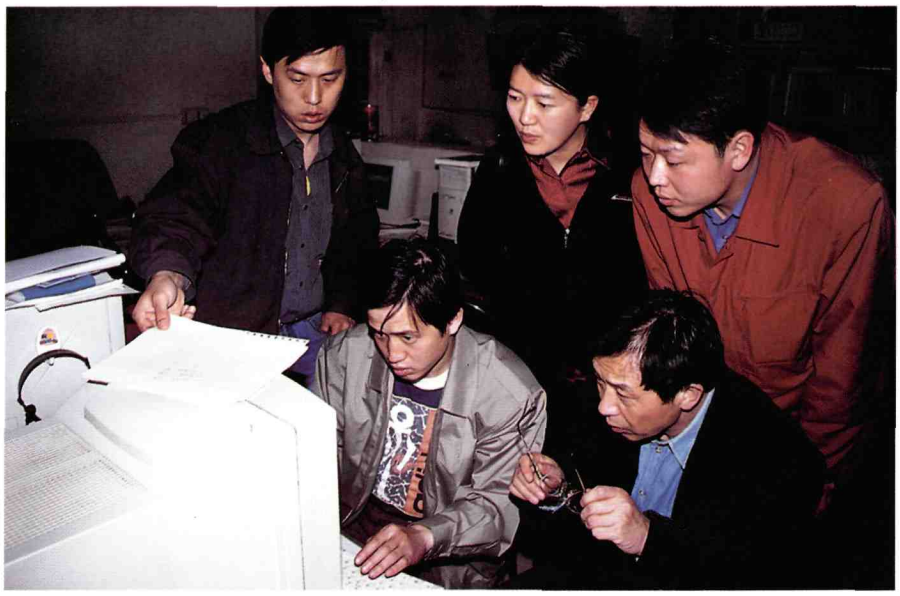
The third version of Beijing Farmknow will offer farmers and others visiting the website an expanded menu of information which includes: Crop varieties, soil fertility, farming techniques, plant protection, processing and storage, food security, food safety, vegetable market information, export requirements, and a directory of vegetable farming experts.

The new version will also provide visitors to the website with an extensive on-line help-facility to make sure that users can access the website in an effective manner and thereby retrieve the most relevant information they are searching for.

Farmers using the website will also be able to click on dedicated e-mail links which will put them in touch with the most appropriate bureau staff, if they require additional information or assistance not available at the website. Links will also be offered at those sections of Beijing Farmknow dealing with vegetable varieties so that farmers can learn how to plant the new varieties of vegetables as well as order seeds for these varieties, at the same time, from an e-commerce facility which is a part of the larger BBA website.

Yongren Ma (in brown jacket) Vice Director, Planting Service Centre of Shunyie District with staff of the Beiwu Planting Committee at the computer accessing Beijing Farmknow

Members of the IPMist and BBA teams are mindful that the number of farmers with Internet access will remain relatively low for sometime to come. Farmer Ding of Beiwu Village, for example, has one of only five computers in his entire village. However, information is being accessed indirectly by other farmers without Internet access via farmers such as Ding who have the access. In order to increase the reach of such indirect access, BBA has embarked on an accelerated programme to equip all its 13 county offices, and 122 district offices with computers and Internet access. This will allow BBA's field staff to do searches on Beijing Farmknow on behalf of the farmers they serve. As each office is staffed by an average of five field personnel, this



Some members of the project team. Standing from left: XiaoFeng Qiao, Zhihong Li, and Lixin Zhang (section head, BBA Vegetable Division). Seated from left: ZhongHui Wang and ZuoRui Shen

strategy promises fairly extensive outreach for Beijing Farmknow. The strategy will significantly enhance the quality of BBA's vegetable extension services, since field staff will now have readily on-line expert information to help them trouble-shoot specific problems of the farmers.

BBA is at the same time approaching farming families with larger farms and higher yields to access the bureau's services via the Internet. This is part of a larger experiment by the Ministry of Agriculture and the Ministry of Finance, to train and mobilise 2,000 farmers in pilot areas, of which Beijing is one, to act as "information service staff" to serve their neighbouring farmers who have no Internet access. The families will be selected based on "six ones". They will own one of each of the following six elements: Personal computer, telephone line, a person who will be responsible for rendering the information service, electricity voltage regulator, a room where the computer can be housed, and a printer.

ZuoRui Shen, project director Beijing Farmknow

Shen has innovative ideas of his own. In his wide-ranging travel across China he noticed that telephones are quickly becoming basic farm fixtures. He wants to tap this extensive reach of the telephone to deliver Internet-based content. Shen would like to prototype, in the near future, a telephone-based enquiry service operated by staff who would use the Internet to research questions and problems phoned in by farmers.

In the meanwhile Shen and his team will finalise Version 3 of Bejing Framknow for relaunching as a key component of BBA's overall e-government facility. Apart from an enhancement of its content and links, the new version will also decentralise the management and up-dating of this increasingly large and complex website. Specialists in different sections of BBA will now be able to

The project team

The Integrated Pest Management Intelligent Formation and Software Technology (IPMist) Laboratory, Chinese Agricultural University, Beijing conceived and implemented the project. Prof. ZuoRui Shen is the founder and director of the IPMist Laboratory. Members of the project team include: Dr. Zhihong Li, who developed *PestDiag* and is the assistant director for the project; Hui Li is the principal software programmer; ZhongHui Wang, technician responsible for maintaining the website; and XiaoFeng Qiao, technician responsible for programming Version 3 of Beijing Farmknow. Four technical working groups were also set-up for the project to focus on each of the following areas: Information acquisition, information processing, information technology, and economic analysis. IPMist was founded in 1989 to develop *Ecopest*, a software for analysing ecological problems involved in the management of crop pests. The laboratory has since collaborated on a number of research projects with major national institutions including the Chinese Ministry of Agriculture, Chinese Academy of Sciences, Chinese Academy of Agricultural Sciences. These projects include: *Pq-Informis*, a software system for managing text and illustration on 58 species of plant quarantine insects; *Bj-Cabbagis*, a geographical information system (GIS)-based information management system for vegetable production in the Beijing Region; *PestDiag*, a multimedia system for identifying 80 common vegetable insects found in North China; and *Cn-Vegepest*, a multimedia database of about 200 species of vegetable insects found across China.

Contact address:
IPMist Laboratory
College of Plant Protection
China Agricultural University
Beijing 100094
Peoples Republic of China.
E-mail: ipmist@mail.cau.edu.cn

Software

Versions 1 and 2 of Beijing Farmknow were built using:
MS Frontpage 98, MS Access, MS Active Server Page, MS Visual Studio 6.0, and MS Internet Information Server 4.0.

Version 3 was revamped to run on NT SQL Server.

Content mounted on Version 1 of the website was served from 15 databases holding 475 records.

Useful links

Beijing Farmknow:
http://www.farmknow.com

Homepage of IPMist Laboratory:
http://www.ipmist.org

" I refer to Beijing Farmknow to get ideas on what to grow on my farm and to get scientific advice on how to control plant diseases. "

Zuoying Li, Farmer
Shunyi Vegetable
Production Base, Beijing

log-on to the server to up-date information which they are responsible for publishing on the website. This is expected to not only improve the currency of the content but also provide staff at BBA with a greater sense of ownership of the website and better appreciate the needs of the audience it serves.

Bejing Farmknow began as a needs-driven initiative. Shen and his team conducted a survey in four villages in the farming areas of Beijing: Bai-Jin, Qian-Liu-Ma and Hu-Ge-Zhuang. Altogether 60 farmers were interviewed along with their village leaders. The farmers confirmed their strong interest in receiving information on vegetable farming. A vivid illustration of this high level of interest came from Qian-Lu-Ma village where the researchers found one of the farmers subscribing to 10 different magazines about vegetable production.

The survey confirmed farmers' interests in 20 different types of farming information covering topics related to crop varieties, integrated pest management, and marketing issues. A prototype Beijing Farmknow website was designed and built to respond to the needs identified in the survey. The prototype was then extensively pre-tested on the campus by students and staff of the China Agricultural University. Farmers were also invited to the campus to take part in the pre-testing. This was followed by refinements to the prototype based on feedback received during the pre-testing. The website was then published on the Internet, and the carefully assembled sets of information made freely available to the public.

WTO and the renewed interest in information

The interest in information about vegetable farming has since increased significantly following China's accession to the World Trade Organisation (WTO). The opening up of China's markets will impact heavily on farmers in the Beijing area as they have traditionally grown wheat in their fields – a crop with which they will not be able to compete successfully in the face of cheaper imports. BBA is promoting vegetable farming as a viable and profitable alternative to wheat. To make this switch, the farmers need to learn everything about vegetable varieties: how to grow, harvest, process and market them. Beijing Farmknow became an important tool to help the Beijing farmers make this major transition.

Zuoying Li is one of the farmers who made the switch early on and has benefited greatly from his pioneering move. He is now one of the largest vegetable farmers in Beijing. His farm employs 100 agricultural workers, 20 drivers to deliver the produce, and 15 administrators who help him run his farm office. Right next to his table in his office is the computer which Li uses to access the Internet. "I refer to Beijing Farmknow to get ideas on what to grow on my farm and to get scientific advice on how to control plant diseases. Such information is very important since China joined WTO." The ideas and advice he has gotten so far has helped him grow some of Beijing's freshest capsicum, tomatoes, cabbages, aubergines, melons, cucumbers, and dozens of other vegetables. His success has been capped by a visit of The President of China to his greenhouses.

Prof. ZuoRui Shen's innovative work has been acknowledged with invitations to present his experiences with Beijing Farmknow to almost every major agricultural university in China. He had his suitcase packed, just as we were completing his interviews for this report, to board a train headed for three of the few remaining Chinese provinces where he had yet to present his project. On these trips he offers to share the software templates used in creating Bejing Farmknow with others interested in building similar websites for their farmers. For a project started "small", the results are turning out to be big.

The e-marketers of South India

Project output

India Shop website with full e-commerce on-line transactions capabilities.

Project outcome

100 e-marketers comprising 22 to 30-year-olds who have just completed college education. Women make up 40 percent and men 60 percent of this total.

Sales of an average of $2,000 USD per month at the India Shop website.

About 1,800 products crafted by 40 artisans being offered for sale worldwide at India Shop.

Internet Bazaar website funded by the Government of India which aims at promoting crafts and artisans from throughout India and operated as a sister site of India Shop.

Virtual supermarket concept and prototype CD-ROM.

Awards/recognition for the project:

- Ericsson Internet Community Awards (ERICA) 1999 Finalist
- Golden Web Awards 1999

X. Raymond Raj, an e-marketer, examining a bronze statue of Ganesha before packing and shipping it to his customer

A saree being embroidered by hand in Kunnam Village located 35 km from Chennai. The saree is a popular item with visitors to India Shop

The majority of merchants who sell their goods over the Internet have adopted the metaphor of the "virtual shopping mall" when establishing their businesses. In nearly all cases these malls in cyberspace are curiously deserted spaces. Shoppers logging-on often find themselves presented with impersonal catalogues and automated shopping carts powered by distant computers.

"This is not the way to sell," Santosh from FOOD (Foundation of Occupational Development), Chennai, India told himself when he first encountered electronic commerce. "Customers need to be attended to by sales staff to answer their questions about the goods, and finally to clinch the sale." When the opportunity came for FOOD to set up shop in cyberspace, Santosh and his colleagues decided that their shop should be properly staffed by sales people. The concept of the "e-marketer" was born.

"I got the idea of setting up an e-commerce site when I attended a Pan Asia Networking workshop," recalled Santosh. He was referring to a PAN seminar on e-commerce held in Singapore in 1999 when participants were introduced to various aspects of e-commerce, from the technicalities of building a website to the legalities of intellectual properties.

An astute marketing intuition

Santosh and Loyola Joseph, the energetic social work specialist who founded FOOD 20 years ago, fused their astute marketing intuition with their keen development instincts when they went about the formation of the pioneering group of e-marketers. They decided to focus their recruitment drive on unemployed and under-employed graduates.

Joseph saw an opportunity to create employment and generate income for young people living in the vicinity of Chennai where FOOD is based. He also sensed a further opportunity of improving the quality of life for young families. "People now spend up to half their salaries on transportation to work, and paying for their meals while at work. At the same time their children often come back from school to empty homes because both their parents are at work when school is over. If the parents can work from home, they will not only save money but can also care for their children."

Project basics

Grant:
$60,000 CAD

Grant used for:
- Staff salaries
- Purchase of 15 personal computers, digital camera, and a wireless router
- Training sessions for 20 groups of e-marketers
- Research expenses including reference material
- Cost of participating in e-commerce conferences

Supplementary grant from other sources:
FOOD contribution: About $40,000 CAD (In kind)

" I got the idea of setting up an e-commerce site when I attended a Pan Asia Networking workshop. "

Santosh Narayanan
Staff member coordinating FOOD's ICT initiatives

Loyola Joseph, founder of FOOD, visiting craftsmen in Mahabalipuram Village, located 50 km from Chennai. India Shop promotes these sculptures

In FOOD's strategy, e-marketers will be recruited, trained, and then encouraged to work from home via a computer and an Internet connection. They will not receive a salary but will earn a sales commission of 10 percent of the value of all the goods they help to sell at FOOD's e-commerce web-site. During the eight months that the scheme has been operating, the 100 e-marketers registered with FOOD have earned between 2,000 to 10,000 Indian Rupees a month. While some of them work from home with a personal computer, many have chosen to work in small groups sharing a computer and an Internet connection.

E-marketers work in innovative ways

E-marketers are encouraged to operate in two modes. Firstly to respond to enquiries from visitors to the FOOD website, "India Shop" and develop a one-to-one relationship with each potential customer. Santosh has observed that it takes an average of about four exchanges of e-mails between an e-marketer and a customer to clinch a sale. In some instances, the correspondence may be more drawn-out and involve a great deal of legwork on the part of the e-marketer. The merchandise frequently requiring such intensive customer service is the saree, the elegant dress worn by Indian women. Sarees are a popular item at the India shop where a unique hand-embroidered variety are offered for sale. Customers often want to know more about the texture and design of the embroidery before placing an order. The e-marketer would sometimes make special visits to the artisans making the sarees to photograph close-ups of fabric and patterns for attachment to e-mails to be sent to potential customers of particular designs of sarees. E-marketers are encouraged to be consistent and persistent with their e-mails. This is what an excerpt from FOOD's "Guidelines for e-marketers" recommends:

> Follow up is more than just a process, it's an art. To do it effectively you need a system and then you need to stick to that system every day! If you don't follow up with prospects consistently and in a timely fashion regarding their individual information requests then you might as well forget the whole process. Consistent follow up gets results.

E-marketers are also responsible for subscribing past and potential customers to India Shop's newsletter which reports on new products and the artisans who

make them. The newsletter is distributed in the form of e-mails.

In the second mode, e-marketers are encouraged to be proactive. To get on the Internet and seek out customers. They typically do this via chat-rooms and discussion groups about themes related to Indian culture and lifestyles.

The India Shop website is designed to reinforce the efforts of the e-marketers. It offers a free screen-saver featuring a slide show of photographs of sculptures of various Hindu deities on sale at India Shop. Visitors are encouraged to download the screen-saver which features the web-site address of the India Shop on one slide of the screen-saver thereby reminding visitors to pay return visits to the shop.

The homepage of India Shop

Apart from generating income for the e-marketers, FOOD has a dual objective of promoting the products of artisans working in the hundreds of villages surrounding Chennai – these artisans keep alive centuries-old traditions of hand-crafting a wide variety of products ranging from the ever popular sarees to the revered sculptures of Hindu deities. The artisans currently sell their handicraft via middlemen. FOOD hopes to be able to provide the artisans with better returns on their work by brokering direct sale of the craft to their ultimate purchasers. And since most of India Shop's customers are located outside India, FOOD hopes that such sale reaches a new segment of the market which the artisans have not been able to sell to until now, thereby effectively expanding the demand for the artisans' work.

The future

India Shop is off to a promising start during its first year of business. In this project Loyola Joseph, FOOD's founder, has found some answers to a question he posed himself eight years ago: "How do we leverage ICTs for development?"

Kunnam villagers discussing with Joseph arrangements for selling the sarees they produce at the India Shop

About the project team

Foundation of Occupational Development (FOOD) is an NGO which conducts activities, experimentation and research in sustainable development, energy conservation, employment generation, environmental sanitation, education, cost-effective housing and ICTs. It is based in Chennai, India and coordinates its work through 102 project sites located across Southern India.

Loyola Joseph founded and headed FOOD for the past 20 years. He has a MA in Social Work, and ran his own manufacturing enterprise for some years before giving up the private sector to start FOOD.

Santosh Narayanan has a B.Sc. in Computer Science. He joined FOOD seven years ago to concentrate on the organisation's activities involving the use of ICTs.

Contact address:
Foundation of Occupational Development
63-C Block, 1st. Floor, Bharathiyar Complex
Jawaharlal Nehru Road
Vadapalani
Chennai - 600 026
India.
E-mail: food@xlweb.com

Software used

- Self-developed shopping cart application based on Linux operating system
- PERL programming software
- Apache web-server
- Web trends web site monitoring software
- Credit card payment system provided by 2 Check Out

Hardware used

- Server with Pentium II 450Mhz processor and two hard drives operating in tandem via the Linux RAID mirroring software
- 64 kpbs leased line connection

Useful links

India Shop website:
http://www.xlweb.com/indiashop

Internet Bazaar website:
http://www.internetbazaar.org

FOOD's homepage:
http://www.foodindia.org.in

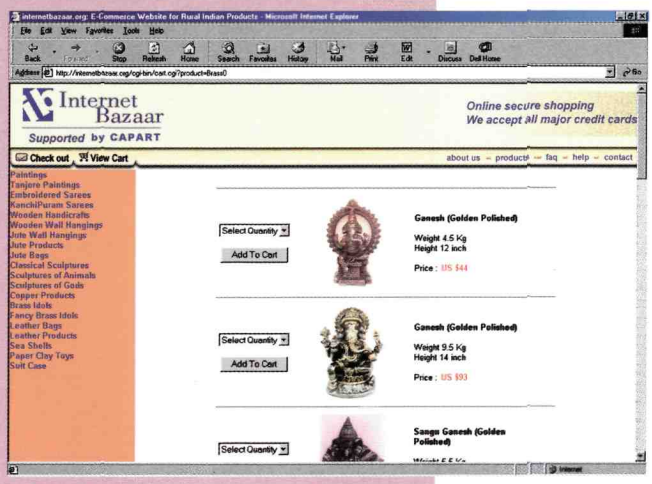
Representatives from various women groups in Chennai meet with Joseph to discuss FOOD's concept of a virtual supermarket

In the quickly evolving business of on-line shopping, India Shop needs to hone its business model and sustain its growth. The current altruistic mode of taking no profit from transactions made at the India Shop website is obviously not sustainable. India Shop needs to revise its pricing of products to not only provide for payments to the artisans who make the products, the e-marketers who promote them, and the cost of shipping, but also to include a reasonable margin which will fund the operation and growth of India Shop.

Support from the Government of India

The early success of India Shop has attracted the support of the Government of India which has awarded FOOD a five-year contract to establish and manage Internet Bazaar, a cyber shopping mall dedicated to the promotion of artisans and craft throughout the whole of India.

The experience of running India Shop has also contributed to the design of a home-based merchandising scheme aimed at serving women. In this initiative, which was still being finalised and refined at the time of publication, women will be provided with a virtual supermarket on a CD-ROM. The disc contains a listing of basic household necessities ranging from sugar and tea, to soap and laundry detergent. The women store managers running these virtual supermarkets will take orders from their neighbours, then consolidate the purchases using the applications on the CD-ROM before e-mailing the consolidated bulk orders to a local warehouse. The orders will then be delivered to the store managers who in turn sort the stock into individual orders before delivering them to their customers. This scheme is aimed at generating income for the store managers while at the same time providing good value to their customers.



The Internet Bazaar website opened to the section promoting bronze statues of Hindu dieties. The design of this website is adapted from India shop

Joseph appears to have found the answers to the question he posed himself eight years ago about how ICTs could be used to leverage development. He summarised his experiences in the intervening years thus: "In the application of technologies we need to have lateral thinking. ICT is just a chisel and hammer. What is important is who is using these tools?"

Indonesian Digital Library Network

Project output

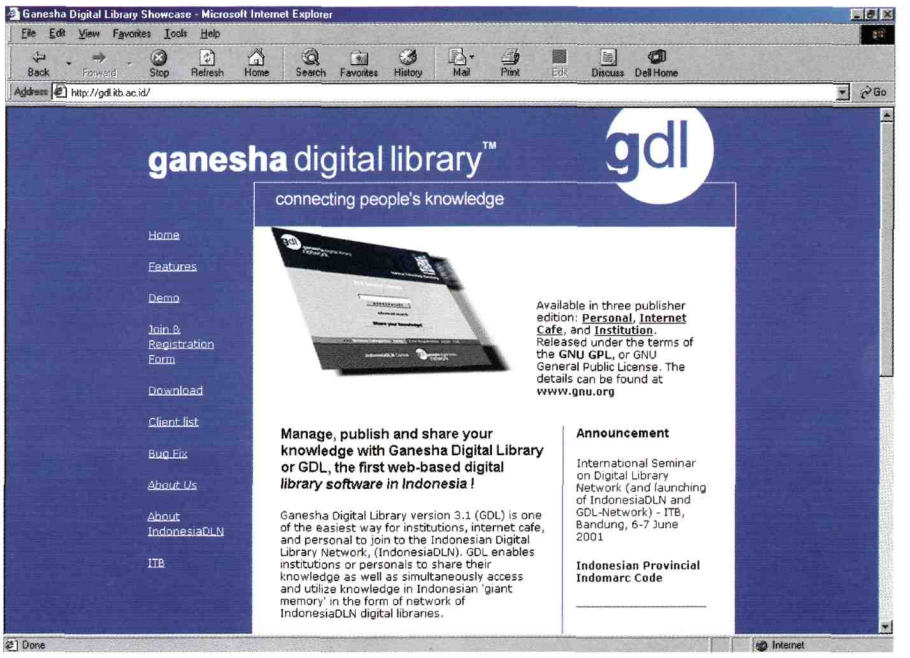
The Ganesha Digital Library (GDL) Version 3 software which is distributed free of cost with its source code. GDL has been acquired by about 1,500 institutional and individual users.

Project outcome

A fully functional Indonesia Digital Library Network with 80 registered institutional and individual members, 30 of which have digital library systems running on GDL and connected to the network. The network has about 4,300 Indonesian library users and another 200 users from around the world.

Award received

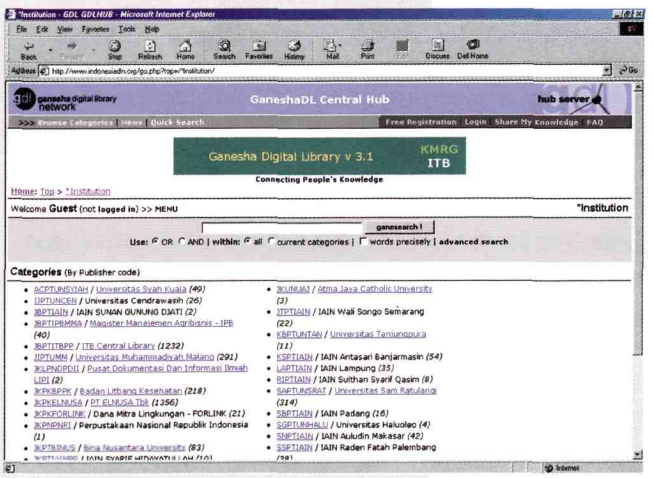
American Society for Information Sciences and Technology, First Prize, 2001 for a paper submitted by the project leader on the project.



The vast information resources of Indonesian libraries has been unlocked. The "key" was provided by the Indonesian Digital Library Network (IndonesiaDLN) initiative and the Ganesha Digital Library software that has been developed. The rich information resources of 25 major libraries in the country are now plugged into the network. The number is expected to rise rapidly during 2002.

IndonesiaDLN offers users instant access to a bibliographic database of current research papers, theses, and dissertations written or published by academic staff, researchers and students of participating member libraries. The database may be searched on-line by anyone with an Internet connection. The number of electronic versions of the original documents of titles and abstracts listed in the database which are instantly available on-line from the network is increasing by the day.

The network has emerged as an important national center for the exchange of research results and scholarly work. Prior to the establishment of the IndonesiaDLN website in August 2000, Indonesia did not have a reliable inter-library loan mechanism to cover the numerous academic libraries spread across the vast archipelago of about 3,000 Indonesian islands. Researchers and scholars had to rely entirely, in the past, on conventional, manual methods of tracking down scientific information, and regular mail to deliver photocopies of the documents requested.



Homepage of IndonesiaDLN

Attracting international interest

The digital library has attracted much interest outside Indonesia during the short time it has been in operation. The American Society for Information Sciences and Technology (ASIST) awarded its First Prize for 2001 to a paper submitted by Ismail Fahmi, Project Leader of IndonesiaDLN about the initiative. In the same

Project basics

Grant from PAN/IDRC:
$60,000 CAD

Grant used for:
- Purchase of two servers, four PCs, printer, scanner, networking equipment, blank CD-ROMs
- Salaries of staff
- Cost of convening a national seminar on digital libraries
- International travel for project staff to attend conferences and demonstrate the GDL software

Supplementary grants from other sources:
- Knowledge Management Research Group: $5,000 CAD
- Indonesian Foundation of Research and Development for Telecommunication and Information Technology (YLTI): 150 million Rupiah
- Partner institutions comprising Eastern Indonesian Universities Development Project, Institut Teknologi Bandung, University of Brawijaya Malang, University of Muhammadiyah Malang, and Institute of Islamic Religion (IAIN): $16,500 CAD

" Our library users from all over the world can now contact us easily. "

Nanan Hasanah, Librarian, Member of IndonesiaDLN

The KMRG team of software specialists at work on GDL Version 4

year, the Penang Library Network in Malaysia reviewed the Ganesha Digital Library (GDL) software, which lies at the heart of the operations of IndonesiaDLN, as a possible model of its work in Penang. "We plan to adopt parts of the ITB Bandung software for our network in Penang, Malaysia," confirmed Rosnah Idrus, the Universiti Sains Malaysia computer scientist who reviewed GDL. The software is named after Ganesha, the symbol of Institut Teknologi Bandung (ITB). Also in the same year, collaborative work began with the Networked Digital Library for Theses and Dissertations (NDLTD) at Virginia University, USA in developing an Open Archive Protocol module at IndonesiaDLN to enable the sharing of information resources between the two networks.

Users within the ITB campus are even more enthusiastic about GDL. Nanan Hasanah, Librarian, appreciates the greatly increased access it has provided to the collection of material which she manages: "Our library users from all over the world can now contact us easily."

A modest beginning

The initiative began modestly in 1999 as an effort to develop a digital library for ITB. The initial objective was to put on-line, within the ITB campus, the institute's bibliographic database of research papers by its staff, and theses and dissertations by the students. The positive results of this initial effort encouraged the team to consider networking libraries across the country so as to provide students and staff with a superior research and referencing tool. The concept for IndonesiaDLN was thus born. Versions 1 and 2 of GDL were written for the ITB library network. The software was rewritten to launch the national network. Ismail Fahmi, who turned down an offer of a scholarship for a Master's degree in Japan to work on the project, completed rewriting the code from scratch during two intense months, when he worked 16-hour days.

Version 3 of GDL adopted the Dublin Core Metadata Standard to provide a crucial capability for linking the national digital library to international networks in the near future. It was written in PHP scripting language that runs on free software to ensure that users will not be required to purchase expensive commercial software in order to run GDL. This new, third version was successfully tested on servers running Apache web server software, MySQL

database software, and Swish-e search engine: all of which are also software freely available without cost to users. The latest version of GDL may also be installed on Windows 9x/NT/2000, Linux and Unix servers.

The completion of GDL Version 3 was followed by the training of 10 librarians at the ITB Central Library to operate the system. A hands-on approach was used in the training exercise during which the librarians uploaded research reports, theses, dissertations, audio and video files on to the server to create the first elements of IndonesiaDLN.

Forming an effective national network

With the prototype of the digital library and system up and running, the project team could now redirect their efforts towards promoting the concept of IndonesiaDLN to other librarians in the country. ITB hosted a national seminar on digital librarianship for 250 participants from across the country. The gathering of Indonesian information specialists provided the project team with an opportunity to promote the concept of IndonesiaDLN and to demonstrate the package of free software which could be used to operate such a digital library.

The seminar was followed up by a meeting of 40 representatives from 23 research and educational institutions in Indonesia. The meeting took the important decision to formally establish IndonesiaDLN. It adopted a couple of important technical standards: Dublin Core Metadata Element Sets Version 1.1 as the basis of the IndonesiaDLN Metadata Standard, and XML format for data exchange among the libraries. At the same time the meeting adopted GDL Version 3 as the core software to run the network. The meeting also decided to base IndonesiaDLN at ITB and elected Ismail Fahmi as its first Secretary-General.

A decision was also taken at the sidelines of the meeting by the Eastern Indonesian Universities Development Project funded by the Canadian International Development Agency, to collaborate with IndonesiaDLN in establishing the Eastern Indonesian Universities Digital Library Network (EIUDLN). This sub-network would adopt the system developed at ITB, and draw upon the technical expertise of the project team to set up EIUDLN in such a way as to integrate with IndonesiaDLN. This sub-network has now been successfully established.

Within the first year of operation, the IndonesiaDLN project team had connected 25 partner servers to the network and 60 other institutions and individuals had registered as network partners. About 4,500 individuals had signed up as users. Of this total, about 4,300 are Indonesians with the other users originating from all regions of the world. During the second half of 2001, users had requested about 21,500 downloads of documents from the network, and read about 140,000 web-pages. The libraries, on their part, have uploaded about 3,500 electronic documents to IndonesiaDLN. Most of these items are "grey literature", or unpublished and usually difficult to obtain material. The IndonesiaDLN team is now advocating to policy-makers in universities and research institutions to update their institutional policies to require staff and students to provide electronic copies of their works so as to speed up the acquisition of new items for the network. Older documents, which are available only on paper, are scanned and converted to electronic formats upon request from users.

Customizing solutions to meet local needs

IndonesiaDLN and GDL are designed to cater to users with varying quality of connection to the Internet. As the speed of access is slow in many parts of the country, GDL offers a facility to participating libraries to download onto their local servers updated information from the central hub server so that users can then access the information via their respective intranets without the need to

The project team

The Knowledge Management Research Group (KMRG) based at the Central Library of the Institut Teknologi Bandung (ITB) were the implementors of this project. The team comprises ten young information technologists. Five of the members are recent graduates of ITB, the other five are registered students with the institute.

" We decided to use only free software to make sure that developing countries will be able to use our system. "

Ismail Fahmi, Project Leader

The team is headed by Ismail Fahmi, 27 years old, who graduated from the Electrical Engineering Department of ITB in 1997. He started working on the institute's digital library while still a student at ITB. Apart from managing KMRG, Ismail is also a researcher with the Computer Network Research Group and the Asian Internet Interconnection Intiative (AI3) based at ITB. He is the Secretary-General of IndonesiaDLN and the creator of the Ganesha Digital Library software.

Contact address:

Knowledge Management Research Group, Institut Teknologi Bandung
Perpustakaan Pusat ITB, Jl. Ganesha 10
Bandung 40132, Indonesia.
E-mail: kmrg@kmrg.lib.itb.ac.id

Hardware

A server equipped with the following minimum components is recommended for each member of the digital library network:

Intel Pentium III 933Mhz. processor
128 MB memory
SCSI 18GB hard drive
IDE 40 GB hard drive.

The server may be connected via a dial-up connection or leased line.

Software

The digital libraries run on free software or shareware which may be legally used and installed without the need for making any payments to their originators. The following are the software recommended for each digital library:

Ganesha Digital Library (GDL) software
Apache web server application
PHP
MySQL
Swish-e search engine.

Version 3 of GDL has adopted the Dublin Core Metadata Standard which will facilitate the exchange of information between IndonesiaDLN and other international and national information networks running on this widely adhered to standard.

Useful links

IndonesiaDLN website:
http://www.IndonesiaDLN.org
Application to acquire the GDL source code: http://gdl.itb.ac.id
First Prize ASIST paper:
http://www.asis.org/Bulletin/May-02/fahmi.html

" We plan to adopt parts of the ITB Bandung software for our network in Penang, Malaysia. "

Rosnah Idrus
Computer scientist
Universiti Sains Malaysia

always log-on to the central server at Bandung. Using the same facility, participating libraries may also upload to the central hub server their latest contributions for sharing via IndonesiaDLN. Participating libraries without reliable on-line access may also request for new information and updates to be sent to them on a CD-ROM.

The project team has decided to make GDL available as an open source software. This means that GDL is not only available free of charge, but users are also provided with the technical means to make enhancements to the software to customize it to meet their particular needs. Such customized versions of the software are in turn made freely available to other users. In this way, GDL will evolve over time as a piece of software which is not only fine-tuned to meet the precise needs of users, but also at the same time enjoy robust technical maintenance and oversight by a large pool of software specialists who represent both the creators and users of the software.

Users interested in obtaining the source code for GDL, which is about 2 MB in size, need to make an application to the project team. The application form is available at http://gdl.itb.ac.id. Applicants are required to confirm in their application that they agree to share the information resources which will be managed using GDL, thereby effectively extending the wealth of information sources on offer via IndonesiaDLN. The source code has been acquired by about 1,500 institutions and individual users during the six months following the release of GDL Version 3.

Planning for the future

This is just the beginning. The project team led by Ismail Fahmi has exciting plans for the future. They have begun work on developing a number of additional digital libraries which will become members of IndonesiaDLN. The libraries under development will serve a host of non-academic institutions such as non-governmental organisations specializing in human rights and heritage issues, farmers' cooperatives, and small and medium size industries. All these specialized libraries will also have access to the other libraries participating in the network. This means that a user of a university library will be able to search and obtain information from the human rights digital library, and vice versa.

The project team is also working with the librarians to evolve a business model for sustaining participating members of IndonesiaDLN. Many of the libraries in the country operate on limited budgets which restrict the full potential of their work. The team will facilitate members of the network in devising a pricing scheme for subscription and document delivery services associated with IndonesiaDLN. It is hoped that this scheme will not only recover the costs of operating the network but also generate income for the participating libraries. A promising future awaits to be further unlocked by this multi-purpose key.

Project output

Six strategy papers on various aspects of IT included in a publication by the National Planning Commission Secretariat (2001) *Information technology for development: IT policy and strategy papers for Nepal.*

A National Stakeholders Workshop attended by 143 participants representing a diversity of interests and sectors. The proceedings for the workshop was published by the National Planning Commission Secretariat (2001) *Proceedings of a national stakeholders workshop on strategy papers prepared for Nepal on information technology for development (24 August 2000).*

The Information Technology Policy for Nepal.

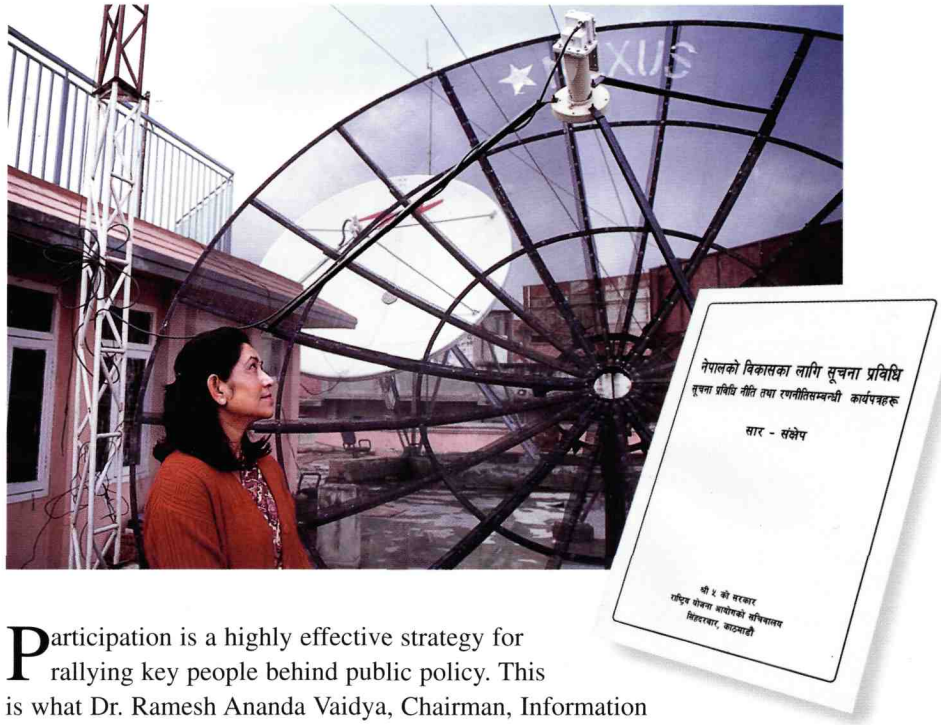
Project outcome

Formation of the following national policy implementation groups: The National Information Technology Development Council, The National Information Technology Coordination Committee, and the Information Technology Park Development Committee.

Budgets approved for the following: $1.5 million USD to establish an IT park; $3 million USD to launch an IT human resources development programme, and $1.5 million USD investment in the IT venture capital fund.

Application of IT-friendly regulations to the operation of businesses thereby easing import requirements for hardware and software, accelerated tax-depreciation on equipment and software, and expedited processing of income from software and IT services exports.

Participatory policy making in Nepal



Participation is a highly effective strategy for rallying key people behind public policy. This is what Dr. Ramesh Ananda Vaidya, Chairman, Information Strategy Formulation Steering Committee, National Planning Commission discovered when he opted for a participatory approach towards formulating a national policy for Nepal's information technology (IT) sector. It is one of the first instances when such an approach has been attempted in making national policy in the country.

Vaidya offered a pragmatic rationale for taking this route: "To ensure smooth implementation of policy, we adopted a participatory process in which the government, private sector and civil society share a common discussion forum during policy design. We believed such a process based on the consensus of IT stakeholders would lead to 'goal congruence' among them and thus facilitate successful development of the IT sector."

Nepal's IT policy is also exceptional on a second front. It was formulated almost entirely through the efforts of Nepali professionals. A couple of foreign specialists were involved, but only as peer reviewers of research conducted to serve as the basis for designing the policy. The research itself was an indigenous effort.

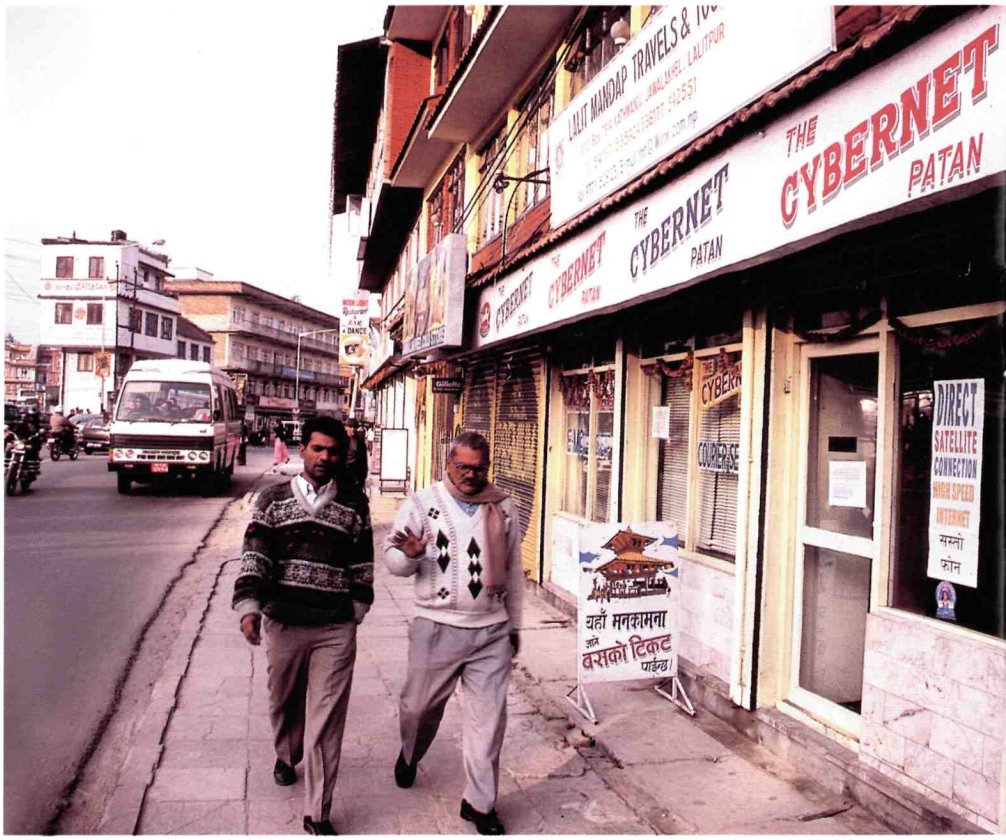
Vaidya launched the year-long policy design process with a series of informal consultations with members of the IT industry. The consultations helped him to learn about the sector, gauge important concerns and map key issues. This led to the formation of the steering committee, officially called the IT Strategy Formulation Steering Committee at the National Planning Commission. It comprised three members from the government, a member of the private sector, the Vice-Chancellor of Tribhuvan University, the Executive Chairman of the Institute for Integrated Development Studies and two members from the International Centre for Integrated Mountain Development which is headquartered in Kathmandu.

Vaidya chaired the committee, and as he was also the chairman of the IT Policy Sub-Committee of the National Information Technology Development Working Committee, helped forge a strong link between the work of the steering committee and the national policy-makers.

Project basics

Grant awarded:
$60,671 CAD

Grant used for:
Research expenses, publications, organisation of a workshop, and consultants' fees.



Nepal's new ICT policy will nurture enterprises such as this Internet cafe in Patan, Kathmandu

The steering committee commissioned six strategy papers from six consultative groups of Nepali academics, professionals and government officials. Each of the groups worked in-depth on one of the following areas:

- Universal access to information
- Information and communication technology infrastructure
- Human resources development
- Software production and applications
- Electronic commerce, and
- Electronic governance

The strategy papers were reviewed by foreign experts in the field after they were completed. The review was aimed primarily at confirming the technical accuracy of the papers. This step was quickly completed after the reviewers found the papers to be sound. All the papers were then published on an Internet website for public review and comment. Government officials responsible for drafting the policy began to study the papers and to consider policy options which responded to the recommendations made in the six papers. This led to the preparation and circulation of a draft of the policy.

At the same time, a National Stakeholders Workshop was held in Kathmandu in August 2000 to discuss the strategy papers, the draft policy, and the role of information technologies in the development of Nepal. The meeting was attended by 143 people representing a diversity of groups concerned with the new technologies. They ranged from gender specialists and development workers to Internet service providers and journalists. The participants broke into six smaller working groups after the opening session; each group focused their discussions on the theme of a strategy paper. The debate which ensued was in-depth and forthright. Each group wound up its discussions by making recommendations on

the theme. The gist of the discussions and recommendations were then reported to all the participants when they met in plenary during the second half of the workshop. The participants were invited at this time to discuss all the six themes. This process turned out to be very productive in identifying obstacles hindering the diffusion of the information technologies, generating ideas for promoting the sector, and developing solutions to existing problems.

The workshop, together with the collection of comments received via e-mails responding to the six strategy papers published on the Internet, generated valuable input into finalising the IT policy which was approved by the government in October 2000. The following is a very brief synthesis of selected aspects of the policy:

Objectives of the IT policy:

- To make information technology accessible to the general public and increase employment,
- To build a knowledge-based society, and
- To establish knowledge-based industries.

Strategies for accomplishing the policy:

- The government will promote and facilitate the rapid diffusion of the technology, and regulate its operation.
- High priority will be accorded to research, development and extension of the technology involving the private sector.
- Competent human resources will be developed by the public and private sectors working together.
- Domestic and foreign investments will be encouraged.
- E-commerce will be promoted within an appropriate legal framework.
- E-government will be promoted.
- Information technology will be applied in rural development programmes.
- Information technology-based industries will be encouraged and promoted.
- Information technology service providers will operate in a competitive environment to ensure that services rendered will be of a good quality and reasonably priced.
- Computer education will be included in the school curriculum.

Action plan for implementing the policy:

Infrastructure development:

- A broadband information network will be built to link the country to the rest of the world.
- An IT park will be established within the Kathmandu Valley.
- Companies setting up operations within the IT park will pay only one percent customs duty on imported equipment over the next five years.
- Internet nodes will be established in all development regions of the country by 2002 in collaboration with the private sector; all telephone calls made to these nodes will be charged as local calls even if they are made from a long distance.
- Electricity supply and telecommunications services will be provided to entrepreneurs involved in the information technology sector.

Human resources development:

- Computer sciences and computer engineering courses will be developed and offered by the universities.
- Computer sciences will be offered as an optional subject in secondary schools and eventually made a compulsory subject of study.
- Knowledge about computers will eventually become an essential qualification in

About the project team

The IT Strategy Formulation Steering Committee at the National Planning Commission comprised permanent secretaries of the government, heads of regulatory bodies, policy researchers, and a member of the private sector.
It was chaired by Dr. Ramesh Ananda Vaidya who is a Member of the National Planning Commission, and also the Chairman the IT Policy Sub-Committee of the National Information Technology Development Working Committee.

Contact address:
National Planning Commission Secretariat
His Majesty's Government of Nepal
Singha Durbar
Kathmandu
Nepal.
E-mail: Rvaidya@mos.com.np

Dr. Ramesh Ananda Vaidya (right), Member of the National Planning Commission and Project Director with Mrs. Sharada Bajracharya, Under Secretary, National Planning Commission Secretariat

" To ensure smooth implementation of policy, we adopted a participatory process in which the government, private sector and civil society share a common discussion forum during policy design. We believed such a process based on the consensus of IT stakeholders would lead to 'goal congruence' among them and thus facilitate successful development of the IT sector. "

Dr. Ramesh Ananda Vaidya
Member of the National Planning Commission and Project Director

The attractive homepage of the National Planning Commission

the recruitment of new teachers. Computer education will be offered to teachers who are already working in the schools.

- Internet facilities will be provided free-of-cost for a period of four hours each day to schools and universities within the next five years.
- The government will provide scholarships to public and private sector personnel to undertake further studies in information technology.
- The government will also provide scholarships to students from remote areas of the country to pursue higher education in information technology.

Diffusion of information technology:

- Educational institutions and hospitals, located in areas where electricity supply and telecommunication services are available, will be encouraged to adopt information technology in their operations.
- Distance education programmes will be promoted.
- A three-year programme to connect government offices to the Internet will be launched.
- Ministries, government departments and district offices will develop and launch their own websites within a year.
- Websites offering Nepali content will be encouraged so as to preserve Nepali arts and culture, and to promote rural development.
- A public awareness campaign on information technology will be launched.

Promotion of e-commerce, telemedicine, distance education, etc:

- Laws and regulations will be put in place to enable and to facilitate e-commerce, e-business, telemedicine, teleprocessing, distance education and other areas of IT-based businesses.
- Intellectual properties will be protected through the enactment of relevant laws.
- Regulations will be streamlined to facilitate the clearance of revenue derived from the export of IT services and software.

Facilities:

- A venture capital fund will be set up by the government and private sector partners to invest in new IT companies.
- Computer software and hardware will be accepted for accelerated depreciation

in the computation of income tax payable by a company. Hardware may be fully depreciated in two years.
- Investors will be allowed to repatriate the full amount of their investments including interest payments on their investments.

Institutions:
- The National Information Technology Development Council, under the chairmanship of the Prime Minister, will be established to oversee the implementation of the IT policy.
- The National Information Technology Coordination Committee, under the chairmanship of the Minister of Science and Technology, will be responsible for matters concerning the research and development of information technology, and the development of human resources for the sector.
- The National Information Technology Centre will be established to assist government agencies in the computerisation of their record-keeping operations, and to monitor, supervise and regulate the activities of the private sector.
- The Information Technology Park Development Committee will manage the IT parks to be built in the country.

A private sector perspective

Sanjib Raj Bhandari, Chief Executive Officer of Mercantile Office Systems, Nepal's largest and oldest software house, played an active role in the preparation of the strategy paper on "Software production and applications", and as a member of the Information Strategy Formulation Steering Committee. He is also one of three representatives of the private sector appointed to the National Information Technology Development Council. Bhandari is happy that a policy has been put in place by the government and that steps are being taken to implement it. He recalled that "At the top levels of government, there was goodwill" towards the participation of the private sector in the formulation of the IT policy. He is pleased that the policy will help to solve problems faced by the private sector in the past. Software exporters faced much official queries from banks and government departments about revenues earned from software and IT services exports because there are no conventional goods export documentation, such as bills of lading, to verify the sources of the revenue. "Officials used to think these were illegal income," Bhandari recalls. He is also happy that he can now depreciate software and computer software at an accelerated rate for computing his company's financial report. "The people from the tax department used to insist that we depreciate our computers over a ten-year period, and they did not believe that computer software could cost such large amounts of money." While Bhandari is proud that the policy evolved from an indigenous effort, he thinks the time is right to involve some experts from outside Nepal in the implementation of some aspects of the policy, for example, the establishment of the IT parks.

Synthesis of the experience and process

Shahid Akhtar, one of the two members from the International Centre for Integrated Mountain Development who served on the Information Strategy Formulation Steering Committee, and who played a very active role throughout the year of policy design, recalls the experience of the committee: "What this exercise has taught us is that, perhaps, the 'process' is equally as important as the end-product or policy itself. The process adopted in Nepal permitted 'buy-in' into the resulting ICT policy by literally hundreds of key individuals and groups from all walks of life, which included the Nepal Internet Users Group and the Computer Association of Nepal. This 'ownership', in turn, helped to ensure follow-up and implementation of the ICT policy through, for instance, decisions taken on the establishment of the National Information Technology Council, the

" At the top levels of Government, there was lots of goodwill . . . "

Sanjib Raj Bhandari
Chief Executive Officer
Mercantile Office Systems

" Once we were able to get VSAT we were able to get bandwidths 20 times cheaper . . . cost has come down 30 to 40 fold for the users. "

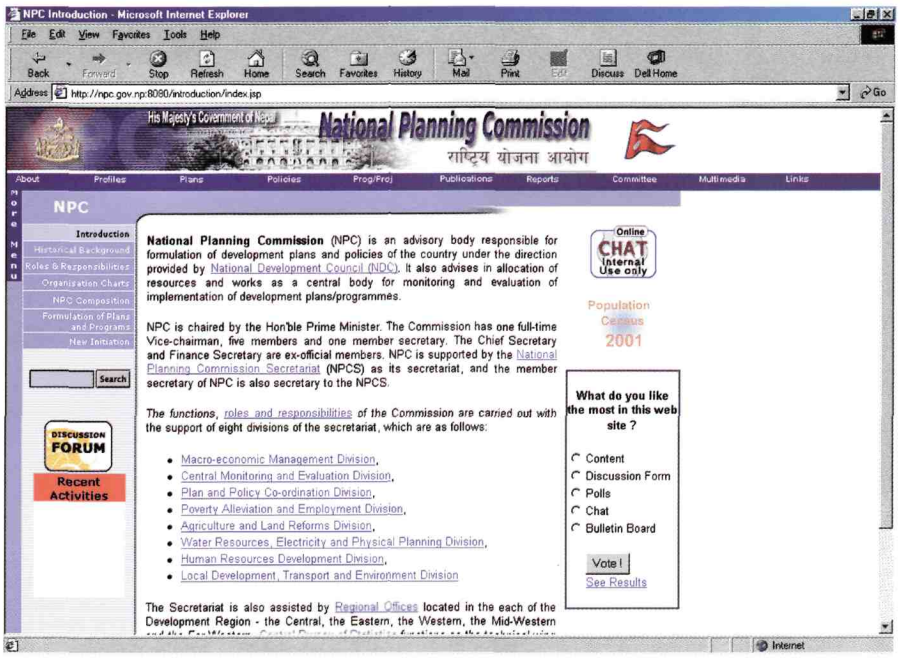
Dileep Agrawal
Founder and President
Worldlink

Useful link

Policy document:
http://npc.gov.np:8080/it/it_policy.pdf

" If you design [the policy] yourself, you know what you want, it is easy to enforce .... Policy is not constant, we need to revise and update it from time to time. "

Bhoop R. Pandey
Chairman
Nepal Telecommunications Authority



The ICT policy and bill can be downloaded at the National Planning Commission's website. The website also features feedback facilities through which visitors are able to post their comments

allocation of substantial financial resources for ICT human resource development programmes, and the establishment of an ICT venture capital fund and an IT park."

Effects of good policy

Dileep Agrawal, Founder and President of Worldlink, one of the top Internet services providers in the country, was not involved in the IT policy-making process, but is nevertheless pleased that the new policy will ease the problems his company faces when importing equipment and software. He feels that the government should have a special information technology department staffed by officials trained in the technology to oversee the sector. Agrawal believes his country enjoys a competitive edge in the IT industry: "Nepal's costs are 30-40 percent cheaper than India's." He recalls how astute government policy can bring much good when he referred to the liberalisation of the Very Small Aperture Satellite Transmission (VSAT) sector in the Telecommunications Policy, 1999. "Once we were able to get VSAT we were able to get bandwidths 20 times cheaper . . . cost has come down 30 to 40 fold for the users."

Bhoop R. Pandey, Chairman, Nepal Telecommunications Authority, played a key role in drafting the Telecommunications Policy which opened up the VSAT sector, thereby helping to spawn many new Internet services providers. He is also the senior official responsible for regulating many facets of the new IT policy. He does not think that it will be difficult to regulate the IT sector according to the new policy: "If you design it yourself, you know what you want, it is easy to enforce . . . Don't depend on foreigners. Our culture is very different. We have to develop our own system." Pandey feels that "Content is going to be the most difficult part" of enforcement. He also advises that "Policy is not constant, we need to revise and update it from time to time."

Given the good results of this initial round of participatory policy-making, there is no doubt that when the time comes for the IT policy to be revised and updated, a second round of popular participation will be launched.

Internationalising Internet addresses

Project output

Developed a Proxy Multilingual Names System for Internet Protocol Version 6.

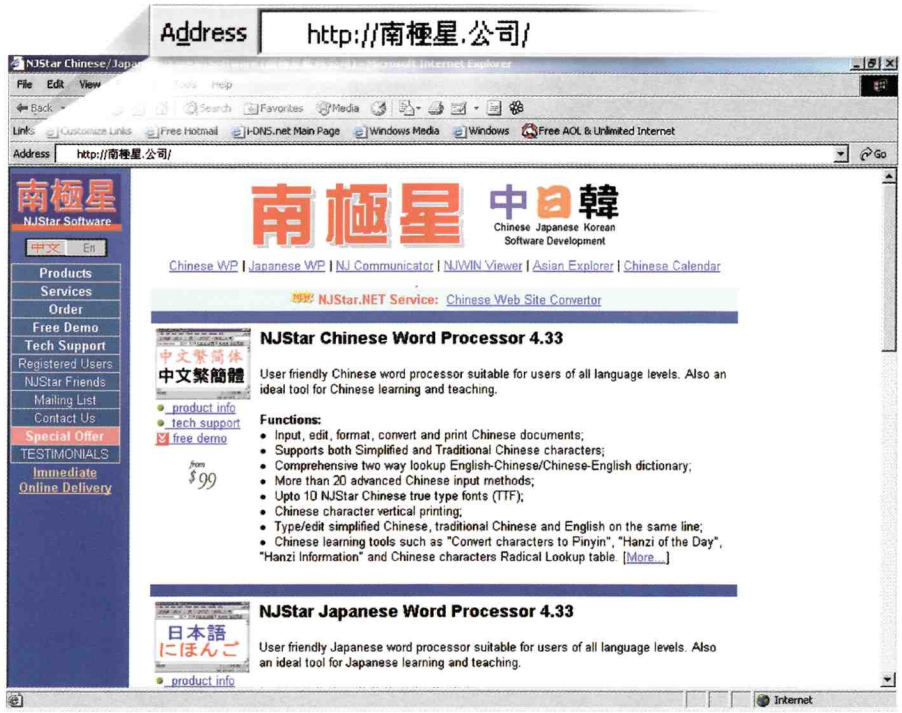
Project outcome

Demonstration of a technically viable Multilingual Domain Names System.

Initiated an Internet Engineering Task Force working group on internationalised domain names.

Organised a series of meetings to raise awareness and advocate for a Multilingual Domain Names System.

Established the Multilingual Internet Names Consortium to coordinate the establishment of critical international standards.



A website with an internationalised domain name

The overwhelming usage of English and the Roman alphabet on the Internet is often cited as a major contributory factor to the Digital Divide. The situation has improved in recent years with the introduction of browser software which support non-Roman fonts such as Chinese, Japanese and Korean. But the most visible element of the Internet – the addresses of websites – continue to be rendered exclusively in the Roman alphabet.

The Domain Names System (DNS) was originally devised to help network engineers connect, or address computers in an English-speaking environment and no provisions were made for non-Roman letterforms or scripts. These original technical specifications have long become obsolete. The Internet has evolved quickly to become a global entity with an increasingly vibrant polyglot character. Some experts predict that a full two-thirds of all Internet users will be non-English speakers by 2003. This trend is exerting heavy pressure upon the technical guardians of the Internet to progress beyond English and upgrade the network to one which is truly global and multilingual. It is a task which is both urgent and well-justified considering that over 90 percent of the world's population possesses a mother tongue which is other than English.

The "domain name" is the most commonly used form of Internet address. We have adhered to the same method of addressing Internet sites for more than 15 years. Domain names have gained particular prominence since the introduction of the World Wide Web in the mid-1990s. In this method we are able to use an address which we can easily read and remember, such as "www.PanAsia.org.sg", to get to a machine-readable Internet Protocol (IP) address (rendered as a long string of cryptic numbers e.g. 203.116.201.2), which we do not have to deal directly with but is nevertheless essential in getting us connected to a correct document or website. Following this naming system, only a limited set of ASCII (American Standard Code for Information Interchange) Roman characters, digits and hyphens, can be used in domain names. Addresses in languages which use

Project basics

Grant awarded:
$40,000 CAD

Grant used for:
Salaries for researchers, travel to conferences, purchase of a server, production of publications.

non-ASCII characters were at first not possible.

Dr. Tan Tin Wee from the National University of Singapore made one of the earliest efforts to render multilingual names possible. A friend had turned to him for help in developing domain names in the Tamil script. Singapore, with her rich, multilingual heritage, was fertile ground for Tan to ponder the technical challenges involved in taking on the task and to appreciate the economic, social and cultural imperatives of getting it done. Tan, who is bilingual in Chinese and English, is also personally very well placed to appreciate the complexities of devising a system which could offer multilingual domain names over the Internet. The Singapore team worked swiftly in the late 1990's and developed two pieces of server software in quick succession for testing. The first was to be applied to the existing Internet Protocol Version 4 (IPV4) technical standard adopted in operating the Internet. The second was a proposal for the next new standard: IPV6. Both were successfully tested and proven to be viable options for further development.

Tan quickly discovered that the technical solutions were probably the easier parts of the task. The other elements dealing with the governance of different

Script	Language	Country/territory	Comment on administrative model
Chinese traditional and simplified	**Chinese**	China, Hong Kong, Taiwan, Macau, Malaysia, Singapore USA, Canada, UK, etc.	Diasporic language. Official language of several economies. Chinese Domain Name Consortium (CDNC)
Hiragana Katakana Kanji	**Japanese**	Japan	>90% Japanese speakers in Japan. JDNA/JPRS/JPNIC are obvious candidates Kanji needs coordination with CJK countries.
Hangeul	**Korean**	People's Republic of Korea (South) Democratic People's Republic of Korea (North)	>80%Korean speakers in Koreas. KRNIC is a potential candidate. Hanji needs coordination with CJK countries.
Arabic	**Arabic Urdu Farsi Jawi**	Algeria, Bahrain, Djibouti, Dubai, Egypt, France, Jordan, India, Iraq, Iran, Kuwait, Lebanon, Libya, Morocco, Malaysia, Mauritania, Oman, Palestine, Pakistan, Qatar, Saudi Arabia, Spain, Somalia, Sudan, Syria, Tunisia, Turkey, UAE, Yemen, and others	Diasporic language. Multi-country official language. Arabic Internet Names Consortium (AINC). Arabic Languages WG, MINC. Urdu Language WG, MINC.
Tamil	**Tamil**	India (Tamil Nadu State), Mauritius, Sri Lanka, Malaysia, Singapore, USA, Canada, UK, etc.	Diasporic language Minority in all countries. Official language in a few. Tamil Nadu State in India is recognized as seat of Tamil Language. International Forum for IT in Tamil (INFITT) Working Group WG02.
Thai	**Thai**	Thailand	>90% of Thai speakers in Thailand.
Lao	**Lao**	Lao PDR	10 times more Lao speakers in Thailand.
Khmer	**Khmer**	Kingdom of Cambodia Thailand (Surin) Vietnam	>90% of Khmer speakers in Cambodia. Official language in one.

Source: Adapted from Hotta, Hirofumi (2001) "ITU briefing paper: Technology and policy aspects." Geneva: ITU (http://www.itu.int/mdns/)

facets of domain names turned out to be highly complex challenges. A good example is the Chinese script and language. There are two ways of writing Chinese: a classical script and a simplified script. Many countries and territories use either one or both the scripts: China, Hong Kong, Taiwan, Macau, Singapore, Malaysia and a large number of other countries which are home to the Chinese diasporas. In addition to this, the Japanese use the Chinese script, which they call Kanji, together with two other scripts: Katakana and Hiragana to render their language. This complex web of stakeholders poses tricky questions. Who gets to decide which script to use? How do we identify a team to work on the technical solutions? Who does the team consult with? And what specifications do they work to?

The table on the opposite page refers to a small selection of scripts and languages and maps the users in different countries and territories with an active interest in a particular script. The map which emerges demonstrates how some scripts, such as Chinese, Arabic and Tamil, have far flung and diverse stakeholder groups who need to participate in resolving various aspects of rendering domain names in their respective scripts. Others such as Thai and Khmer enjoy an easier process as an overwhelming majority of users for each of the scripts live in one country where technical issues may be quickly addressed and solved.

" We are in the business of enfranchising you. "

Tan Tin Wee, Vice Chairman
Multilingual Internet
Names Consortium

Tan decided very early on in his work, that only native speakers of a particular language and users of a script could determine the domain name requirements for a specific language and script. "What right do I have to tell the Mongolian people how to manage their domain names?" This philosophy has driven him on a punishing travel schedule over the past two years to meet with fledging stakeholder groups for different languages to provide them with advice and technical assistance to set up working groups for their respective domain names. Tan became quite fond of telling the people he met that: "We are in the business of enfranchising you." He did much of this work as a member of the Asia Pacific Networking Group. And as word of his pioneering work got around, he became active in initiatives outside the region as well. The Arabic Internet Names Consortium was one such initiative.

An experiment with multilingual names

The Asia Pacific Networking Group formed a working group on the internationalisation of the Domain Name System in mid-1998 to coordinate the work of the different language groups and coordinate the development of multilingual domain names. The working group launched an experiment to operate an Internationalised Multilingual Multiscript Domain Names Service. The first part of the experiment was led by the Center for Internet Research at the National University of Singapore. It involved academic institutions, government agencies and the private sector from China, Hong Kong, Japan, Korea, Singapore, Taiwan, and Thailand. In a separate project, called "iDomain" experiments were set up in several Asia Pacific countries, to provide domain names services in

The project team

The project was based at The Centre for Internet Research, School of Computing, National University of Singapore.
The centre serves as a focal point in Singapore for research and development of new Internet technologies. It aims to accomplish the above mission by collaborating with industry, and international organisations and institutes of higher learning. The centre provides a research environment that is conducive for Internet research and development in protocol engineering, systems software, and collaborative and applied Internet technology.

Dr. Tan Tin Wee did much of his outreach work under the aegis of the Asia Pacific Networking Group (APNG). The group is an Internet organisation dedicated to the advancement of networking infrastructure in this region, and to the research and development of all associated enabling technologies. Its mission is to promote the Internet and the coordination of network inter-connectivity in the Asia Pacific Region. APNG is the leading voice of Internet networking in the Asia Pacific Region. It has spawned off several Asia Pacific organisations including the Asia Pacific Network Information Centre (APNIC) and represents the Asia Pacific region at the Coordinating Committee for Inter-Continental Research Networking (CCIRN), an international body with participation from North America, Europe and South America. APNG operates through an Executive Committee and a Secretariat. It holds meetings twice a year in different locations throughout the Asia Pacific Region. Each meeting is usually associated with a seminar, focusing on current topics of interest related to networking.

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National University of Singapore
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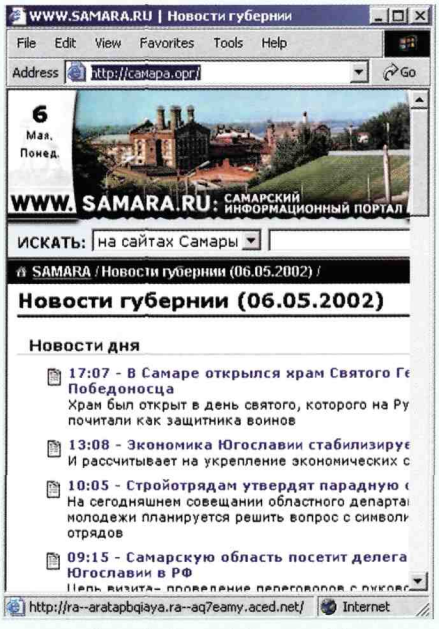
Singapore 119213.
E-mail: tinwee@bic.nus.edu.sg

Useful links

Multilingual Internet Names Consortium:
http://www.minc.org

Briefing paper for the ITU/WIPO Symposium on Multilingual Domain Names, 6-7 December 2001, Geneva:
http://www.itu.int/mdns/



A website with an address rendered in Cyrillic

Chinese, Japanese, Korean (Hangeul), Tamil and Thai languages.

By August 1998, the group was ready to show the rest of the world that domain names could be internationalised. A working prototype multilingual domain name system was demonstrated to international delegates to a major meeting of senior Internet experts held in Singapore. By the end of that year, several countries had expressed an interest in implementing such a system. The countries included China, Hong Kong, Japan, Republic of Korea, Singapore and Thailand. Professional interest in the topic was heightened. It became the focus of discussions over the Internet as well as special interest group meetings held on the sidelines of major Internet conferences around the world. Tan's efforts in mobilizing Asians to address the issue is well appreciated. Paul Wilson, Director-General of the Asia Pacific Network Information Centre, who has been following Tan's work over the years, feels that: "He encouraged Asian voices in the international debate on domain names, and helped to catalyse a number of critical international initiatives in this area."

" He encouraged Asian voices in the international debate on domain names. "

Paul Wilson
Director-General
Asia Pacific Network Information Centre

Going global

Tan's efforts very quickly went global. In June 2000 he joined a group of senior information technology specialists from all the five continents and founded the Multilingual Internet Names Consortium. The consortium aims to promote the multilingualisation of Internet names, including Internet domain names and keywords, the internationalisation of Internet names standards and protocols, technical coordination, and liaison with international bodies. It took over some of the work of the Asia Pacific Networking Group in this area. The work of the consortium will complement and support that of other groups working towards similar objectives. These include the Arabic Internet Names Consortium, the Chinese Domain Name Consortium, the International Forum for Information Technology in Tamil and the Japanese Domain Names Association. Several prominent multinational companies have also begun work within the area.

The Multilingual Internet Names Consortium, which is headquartered at the National University of Singapore, will keep Tan and his colleagues working at the same hectic pace which led to its founding. The consortium needs to tackle several rather big tasks over the coming years:

- Step up liaison with key international groups;
- Coordinate implementation and testing of internationalised domain names;
- Promote and create awareness about the implementation of internationalised domain names;
- Internationalise other types of Internet applications such as e-mail, directory services and newsgroups;
- Explore internationalisation of other types of Internet names such as keywords.

Project output

Skills development:

290 farmers, factory workers, members of cooperatives and teachers provided with basic training in the following:

- Basic Internet and e-mail: 241 trainees
- Basic MS Word: 34 trainees
- Basic MS Excel: 15 trainees

Representatives from 16 local government and non-government organisations trained in the following courses:

- Basic Internet and e-mail: 22 trainees
- Advanced Internet and e-mail: 20 trainees
- Website building: 20 trainees
- Hyper-Text Mark-up Language: 20 trainees

PDA staff based at Nang Rong trained in the following:

- Basic Internet and e-mail: 12 trainees
- Advanced Internet and e-mail: 8 trainees
- Website building: 8 trainees
- Hyper-Text Mark-up Language: 8 trainees

Infrastructure:

One telecentre with five computers and full Internet access established.

A local area network connecting seven computers used by PDA staff and the five computers in the telecentre designed and installed.

A dial-up connection to the local Internet services provider established using a 56 kbps modem. The connection is available to all computers connected to the local area network.

Website:

A website for the CBIRD Nang Rong Centre: http://www.pda.or.th/nangrong

Connecting the last miles to Nang Rong

This scene of Par Arn, a farmer from Raikok Village on Korat Plateau in Thailand, packing organically grown medicinal herbs for the local market with the help of her husband, hardly suggests the presence of an Internet connection. But it's there. The four posters hanging on the rafters of her cooperative's hut contains the "recipes" for mixing an organic pesticide using local herbs and plants, as well as a "formula" for making compost; both were downloaded from the Internet and transcribed on to the posters at the Lighthouse Project and hand-carried to the farm by field workers.

This experiment to bring the new information and communication technologies to rural Thai villagers is run out of the Community Based Integrated Rural Development (CBIRD) Centre at Nang Rong, Buriram established by the Population and Community Development Association (PDA) of Thailand. Nang Rong is located on the Korat Plateau, a part of the country which is economically less developed than many other parts of the country.

Mixing a little of everything

The Lighthouse Project is a mix of a little of everything. It established a local area network for the CBIRD Centre. It also equipped a large and comfortable room with five computers which have access to the Internet. This room has evolved into a telecentre for factory workers and students working or living in the neighbourhood where they can surf the Internet or send and receive e-mails. Field staff of the CBIRD Centre use the Internet connections provided by the project to research farmers' problems and print out solutions for discussion with the farmers during their field visits. Samnarn Chaikot, the cheerful and hard-working PDA Operation Officer back-stopping the project, has worked closely with his colleagues at the CBIRD Centre, farmers, factory workers, teachers and school children to evolve the application of the information technologies in a rural setting. The impact of the project is beginning to show two years after its launch.

CBIRD Centre field staff have searched, downloaded and hand-delivered web-based information on agriculture to 353 farming families, such as the one headed by Par Arn, engaged in vegetable and rice cultivation. In this way, content from the Internet has been delivered across the last "unconnected miles" to farmers without direct Internet access.

Two schools near the centre, Nong Bote School and Suksasongkhor Nang Rong School, have established their own computer laboratories, equipped with ten personal computers each, using grants from the provincial government. They were two of only four schools in the province to receive the special allocations. One of

Project outcome

Internet access provided to the following:

- 1,000 individual users
- 3 village groups
- 5 sub-district cooperatives
- 7 schools
- 6 companies located at the CBIRD Nang Rong Centre
- 6 CBIRD project groups

63 percent of all trainees who participated in courses and used the telecentre are women.

353 farming families without Internet connections provided with information downloaded from the Internet by field staff of the CBIRD Centre at Nang Rong.

2 schools awarded special grants by the provincial government to install computer laboratories on their premises.

Staff of the CBIRD Centre at Nang Rong now enjoy vastly improved communication with the PDA headquarters in Bangkok, and their project collaborators around the world.

Project basics

Grant awarded:
$75,000 CAD

Grant used for:
Purchase and installation of a local area computer network, subscription to an Internet services provider, training courses, seminars and technical meetings, and travel expenses.

Contribution from PDA:
$90,000 CAD in kind and staff salaries.

Samnarn Chaikot (standing left) of the Lighthouse Project with teacher Boua phan Supame, and her students

the reasons why the schools were awarded the grants were because the schools' teachers had trained at the Lighthouse Project on information technologies and the Internet. Students from the schools are enthusiastic users of the Internet to help them with research for their assignments. Many of the students still visit the Lighthouse telecentre after school to log-on to the Internet.

Vanida Jumphimai, a factory worker, also visits the telecentre during breaks. Her regular searches on the Internet are aimed at tracking down the latest prices for rice which she and her fellow farmers grow on their paddy fields in Choakchai Village. "My farmer-friends depend on me to get the price of rice from the Internet," Vanida said.

Boua phan Supame (left) and Daorung Arpornpong, teachers at Nong Bote School, in their new computer laboratory

Members of the Lamsaiyong Cooperative who operate an independent shoe factory in a village next to the CBIRD Centre use the Internet to look up the latest shoe designs being promoted at the Bata corporate website. As the cooperative is a sub-contractor to Bata, members are able to keep up with the latest product designs and plan for future production contracts. The cooperative has bought its own computer and is using it to automate many administrative and record-keeping functions.

PDA staff at the CBRID Centre are the most active users of the Lighthouse Project facilities. They felt its impact immediately. Communication between the staff based in Nang Rong and their colleagues at their Bangkok headquarters improved overnight with the Internet connection. The facility they appreciate the most is their ability to exchange working documents with Bangkok almost instantaneously by attaching the documents as files to e-mails. It took at least two days in the past to send and receive urgent documents from Bangkok using the special delivery services of the post office.

Improvements to communication with international development agencies was just as significant. The most vivid example of this is seen in the work of Kaensri Chaikot, the PDA Operation Officer based in Nang Rong who is responsible for

developing the curriculum for PDA's Rice College at Lamplaimat. "I found the Internet most helpful to my work in preparing the rice college's curriculum." Kaesri also reported that she was able to contact rice experts at the International Rice Research Institute in Los Banos, Philippines, using e-mail and download from the institute's website technical documents used in her curriculum design.

Tracking market trends

In an irrigation project, PDA field staff are able to use the Internet to track prices of various cash crops and share these market trends with farmers participating in the project. The farmers are then able to make well-informed decisions on which crops to plant, and at what times to plant them, after researching the charts and tables downloaded from the Internet. PDA learnt one important lesson from the Lighthouse Project: "Just providing hardware and an Internet connection is not enough. People need to be trained in using the hardware and how to search for information." Wilas Lohitkul, PDA's Director, Rural Development Bureau shared this experience with the Prime Minister of Thailand when he visited the Lighthouse Project together with other members of the Thai Cabinet.

The Prime Minister (right) arriving with Mechai Viravaidya, founder of PDA to visit the Lighthouse Project

The training which Wilas referred to was offered via five training courses conducted at the telecentre: Basic Internet and e-mail, advanced Internet and e-mail, basic website design, e-commerce, Hyper-Text Mark-up Language (HTML), MS Word, and MS Excel. An average of 20 participants took part in each of these courses. They represented 16 organisations comprising farmers' organisations, schools, government agencies and non-government agencies.

Special training courses were also conducted for villagers about the Internet and how to use e-mail facilities. There were a total of 501 applicants for these courses but the project has been able to train only 290 of the villagers. By including the organisations represented by all these villagers in the tally, a total of 65 organisations have been served by the Lighthouse Project so far. All the training and Internet usage at the telecentre has been provided free-of-charge to participants and users. This cost-free policy has succeeded in attracting a good number of rural users, many of whom do not have spare income to spend on trying out new technologies. Now that the technologies are well publicised, the project will consider devising a cost recovery scheme to sustain the telecentre on the long term.

PDA staff working at the CBIRD Centre in Nang Rong were also trained in the use of e-mail and the Internet. Other aspects of their training included: MS Word, MS Excel, and MS PowerPoint. Staff of the King Mongkut University of Technology Thonburi (KMUTT) were engaged as the resource people who helped to design and run some of the earlier training courses. This team of specialists also helped to design and set up the computer hardware, software and local area network at the Nang Rong centre. The original design of the project called for the installation of an Internet connection via a satellite hook-up. This eventually turned out to be unnecessary when a local Internet services provider started serving the Nang Rong area and the project was able to connect to the Internet by

About the project team

The Lighthouse Project was conceptualized and implemented by the Population and Community Development Association (PDA) of Thailand. PDA was founded in 1974 by Mechai Viravaidya to focus on family planning issues. The organisation has since broadened its work to cover a range of community-based development issues. PDA programmes and services dealing with water resource development, environmental conservation, primary health care, family planning, and HIV/AIDS prevention now reach over one-third of Thailand. The project team comprise: Nutaporn Srisingha, project leader; Pichai Kositpantawong, project consultant; Luxchid Suvanit, project technician; Samnarn Chaikot, project staff; Kaensri Chaikot, project staff; Stefan Bepler, planning staff; Rungrawan Ponalo, finance officer; and Mr. Wilas Lohitkul, Director of Rural Development Bureau III, PDA Bangkok.

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Nutaporn Srisingha
Project Leader

" My farmer-friends depend on me to get the price of rice from the Internet. "

Vanida Jumphimai
Factory worker/rice farmer
Choakchai Village

dialling a local telephone number. This important change in the project design has contributed significantly to the long-term sustainability of the Lighthouse Project because connecting via a local Internet services provider is far cheaper than a satellite connection. As this phase of the project comes to a successful conclusion, Samnarn and his colleagues in Nang Rong are planning for the use of the information and communication technologies in the future:

- PDA staff at the CBIRD Centre will continue to use the e-mail services which have become indispensable for the running of their various development initiatives, the cost of the continued usage of this facility will be absorbed by the centre as part of its overall operating expense.
- Courses on computer applications will be conducted in collaboration with a university, some of the courses will lead up to the award of certificates to successful trainees, while the others will be run as continuing education courses.
- The website for the Nang Rong centre will be expanded to advertise the many services and products available from the centre as well as neighbouring cooperatives and organisations. The main purpose is to promote businesses in Nang Rong and to attract new investments to the area.
- The telecentre will compile, on a continuing basis, useful Thai language websites which farmers, factory workers, and students can visit to obtain useful information related to their respective interests. The project team has detected a decrease in the usage of the telecentre due to a lack of new information sources to sustain the interest of users.
- The project team has also received feedback from users located a long distance from the telecentre that it is difficult for many of them to visit the telecentre on a regular basis. The feasibility of locating computers with Internet connections in villages with a sufficiently large group of users will be explored.
- An e-commerce website may be established to serve as a virtual market place for products made in the villages. These may include speciality rice, handicraft, garments, shoes, bags, and organically farmed herbs and vegetables. By selling directly to customers, villagers and farmers hope to earn higher returns for their products, and also to reach a wider market area than is possible using conventional distribution channels.
- Young people in the villages may enrol in distance education diploma and degree courses which are taught via the Internet. The Lighthouse Project may explore ways of facilitating and supporting the youth by providing access to the Internet as well as a learning-support centre.
- Members of the local communities and organisations will be encouraged to conduct training courses on the use of the new technologies to access content on the Internet, and how to send and receive e-mails.

With these innovative connections, the last miles to Nang Rong may soon be bridged, and the people living on this part of Korat Plateau can live less isolated lives.

" I found the Internet most helpful to my work in preparing the Rice College's curriculum. "

Kaensri Chaikot
PDA staff
CBIRD Nang Rong Centre

Hardware

The local area network comprises:
HP Netserver PIII, 16 ports switch, 12 units Celeron II 700 personal computers, 56K modem, HP Laser printer, Epson LQ-2080 printer, and 2 uninterruptible power supply units.

Software

Windows 2000 server

Useful links

PDA Nang Rong website:
http://www.pda.or.th/nangrong/project_lighthouse.asp

About the ICT Grants Programme

The projects featured in this publication were supported with grants from Pan Asia Networking (PAN), a programme initiative of the International Development Research Centre (IDRC) of Canada which helps researchers and communities in the developing world find solutions to their social, economic, and environmental problems.

PAN's ICT R&D Grants Programme has the objective of building institutional research capacity in the developing countries of the Asia Pacific region, in the area of Internet networking. It is directed at encouraging original and innovative networking solutions to specific development problems. The programme was initiated by PAN with funds contributed by IDRC.

Funds for the current phase of the programme are provided by: the Pan Asia Networking Programme of the International Development Research Centre (IDRC), http://www.idrc.ca/, of Canada, and the Asia-Pacific Development Information Programme (APDIP), http://www.apdip.net/, of the United Nations Development Programme (UNDP). It is administered by Asian Media Information and Communication Centre (AMIC),http://www.amic.org.sg/, . The Programme is overseen by a Committee established by Pan Asia Networking, APDIP and AMIC.

Small grants of up to $9,000 USD and project grants of up to $30,000 USD each will be awarded on a competitive basis to successful institutions from the Asia Pacific region. Preference is given to projects that focus on practical solutions to real problems in Internet policy and technology applications.

Scope of the programme

- **Research and development into innovative ICT applications**, with a clear focus on practical and replicable approaches and techniques
- **Development of practical solutions** based on the application of proven and readily available Internet technologies with a minimum of basic research
- **Research on the outcomes and social impacts** of specific ICT policies and interventions and application of Internet technologies
- **Research on policy matters** affecting Internet networking in the Asia Pacific region, especially where linked to areas such as policy impacts, gender equity, social equity, sustainable communities, and technology diffusion/transfer, and benefits to rural areas

Eligibility

Applications to the ICT R&D Grants Programme will be accepted from organisations located in developing countries of the Asia Pacific region. However, applications from a consortium of organisations from any part of the world will also be accepted where there are one or more "lead" members from the region. Team projects and co-funding with other agencies or organisations are considered desirable.

- Applicants must be a government body or a legally incorporated entity.
- Applications from unaffiliated individuals, or from teams of such individuals, will not be accepted.
- Applications that have been rejected by the programme may not be re-submitted for consideration again.

Funding and duration

The ICT R&D Grants Programme is for project funding only, and may not be accessed to cover core or recurrent funding needs. Two types of grants can be applied for, as follows:

- **For Project Grants**, a maximum budget of US$30,000 will be available over a term not exceeding 24 months.
- **For Small Grants**, a maximum budget of US$9,000 will be available over a term not exceeding 12 months.

Approval process

The ICT R&D Grants Programme Committee meets twice a year to review proposals. Responses to submissions will generally be given by the committee within three to four weeks of being reviewed. In certain cases this may take longer, depending on the complexity of the proposal and whether further information needs to be sought by the committee.

How to apply for grants

Information on deadlines for project submission and proposal review dates is made available on the Pan Asia Networking website, the APDIP website and the AMIC website. All grant applications must include:

- **A completed ICT R&D Grants Programme application form**. An application form can be downloaded/viewed from: **http://www.panasia.org.sg/grants/application.htm.** Guidelines for preparing budgets may be viewed at: **http://www.panasia.org.sg/grants/budguide.htm.**
- **A full project proposal and budget**. The application form, proposal and budget must be submitted in soft format (computer readable). When possible, please submit a second copy in HTML format.
- **A document or certificate of incorporation** of the organisation, if the applicant is not a government body.

If you do not receive an acknowledgement of your electronic application within three days of submission, you should e-mail: ApplyRnD@pan.idrc.org.sg (Attention: Ms Julian Ng) to enquire.

Questions should be addressed directly to the administering office at the following address:

Asian Media Information and Communication Centre Ltd. (AMIC)
Jurong Point PO Box 360
Singapore 916412.

Street address:
CS-02-28, SCI Building
Nanyang Technological University
Singapore 637718.
Tel: (65) 6792-7570. Fax: (65) 6792-7129
E-mail: amicline@singnet.com.sg

Writing your project proposal

A proposal to the ICT R&D Grants Programme should provide full details of the proposed project so that it can be properly assessed by the committee. Normally, proposals should be between five and 10 pages in length, excluding annexes. Annexes should be of reasonable length or they will not be examined. All important information should be provided in the proposal text and not in the annexes.

Essential Information:

- **Project background and justification**: State concisely what development networking problem is being addressed by the project.
- **Project objectives**: State precisely what the project will aim to achieve and what specific outcomes will be reached.
- **Project beneficiaries**: State clearly which segments of the population will benefit from the research.
- **Project sustainability**: State how continuity is to be sustained if your proposal is for developing a system that will exist after the project funding.
- **Project methodology**: State clearly in the methodology how the general and specific project objectives will be achieved.
- **Project time-line**: Include a time-table/schedule of key activities.
- **Project outputs**: State what the project will produce and in what form it will be delivered and disseminated.
- **Project monitoring**: State what monitoring and/or evaluation processes are being proposed.
- **Project budget**: Draw up a detailed budget for the project, including other funding sources, if any. Do not submit a budget of more than US$30,000 for a Project Grant and US$9,000 for a Small Grant.
- **Project applicant**: Provide full details of the applicant, including organisational contact details, a document or certificate of incorporation of the organisation, if the applicant is not a government body, and background information (as an annex).
- **Project staff**: Provide full contact details of the organisation applying for the grant, including project leader(s) and staff critical to the project's success. Give their names, qualifications, and relevant experience (as an annex).

Additional information:

- **Provide details of existing research results**, technologies or techniques on which this project will build or depend.
- **Provide details of previous projects** undertaken, where relevant.
- **Provide details of project publicity**, if any.

Criteria for assessment

There are a number of mandatory criteria that all project proposals must meet and which are used in the assessment process. Additionally, other relevant criteria that will be used when considering a proposal, are listed below.

Mandatory criteria:

- Clear objectives, oriented towards specific issues or problems within the scope of the ICT R&D Grants Programme. The starting point of any proposal will be the definition of the problem that is to be resolved through Internet policy and/or technology applications.
- Demonstrated need for R&D results of the type proposed, and in the form proposed. Relevance to regional development priorities, such as economic policy, gender equity, environment, education, social development and capacity building concerns will be considered. The targeted beneficiary groups should be clearly identified.
- Demonstrated capacity by the applying organisation to conduct and document the project effectively within the specified budget and time limits.
- Solid participation by organisations from the developing Asia Pacific region.

Other criteria:

- Originality of the proposed R&D project, and assurance that it is not already being undertaken elsewhere.
- Applicability of the R&D results to developing countries in the Asia Pacific region.
- Leverage of existing techniques and technologies to produce innovative practical solutions rather than original "ground-up" development or basic research work.
- Replicability of the application of R&D results, showing potential for use in other countries in the region.
- Demonstrated opportunity to build R&D capacities within other organisations in developing Asia-Pacific countries.
- Availability of co-funding by other agencies or organisations.

The current phase of the programme is being directed by the following

ICT R&D Grants Programme Committee

which commenced its term of service from January 2002

Mr. Shahid Akhtar
UNDP Asia-Pacific Development Information Programme

Mr. Salman Ansari
Ministry of Science and Technology, Pakistan

Dr. Indrajit Banerjee
Nanyang Technological University

Mr. Richard Fuchs
International Development Research Centre

Prof. Xing Li
Tsinghua University

Ms. Maria Ng Lee Hoon
International Development Research Centre

Dr. S. Venkatraman
Asian Media Information and Communication Centre Ltd.

Dr. Esther Williams
The University of the South Pacific

Mr. Paul Wilson
Asia Pacific Network Information Centre

Pan Asia Networking

Published for the
IDRC CRDI
International Development Research Centre
Canada

Published by
SOUTHBOUND Penang

The six tracer studies for the projects featured in this publication were undertaken by Chin Saik Yoon.

Photography by Chin Saik Yoon except for the picture on page 29 which is duly attributed to the Population and Community Development Association, Thailand.

The summary report on pages 3 and 4 was abstracted and adapted from Mohamed Ally (2002) "PanAsia RnD Grants Programme Evaluation Report".

Publication design and digital artwork by Adrian Cheah, C-Square Penang, Malaysia.

Printed by Jutaprint Penang, Malaysia.

Pre-press services by Eefar Lithographic Penang, Malaysia.

On the front cover: Ding Ruiqi and his wife with their Internet-connected computer at their home in Beiwu Village, Beijing, China.
See page 5

On the back cover: New enterprises such as this Internet cafe in Patan, Kathmandu will be nurtured by Nepal's IT policy.
See page 17

Beijing Farmknow a website for vegetable farmers to access new and profitable ideas of what to grow on their farms.
See page 4

This Singaporean scientist has developed a way of addressing Internet websites using a variety of non-Roman fonts and scripts.
See page 23

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