

eNACA: A Digital Knowledge-Sharing Strategy for Aquaculture

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Abstract

This paper provides a strategic overview of the development and implementation of a very low cost ICT-based communications network. We address issues relevant to the development of an online community in terms of strategy, services and infrastructure.

eNACA is a practical and low-cost strategy to develop a knowledge-sharing network for sustainable aquaculture. Our objective is to develop an online community where participants can discuss issues and share information directly. It is based on internet communications and multimedia publishing technologies. At time of writing eNACA is distributing 12,000 free publications per month via download.

The key components of eNACA are:

- Community driven – participants can contribute to the content of the website, and interact with one another through online forums;
- Use of a multi-media approach to repackage knowledge for distribution in a wide variety of formats to suit people's differing circumstances and capabilities - all publications are made available for download, on CD-ROM and in print;
- A web-based digital library to store, organize and share full-text publications and to provide a 'virtual publishing' service for participants;
- A free email newsletter alert service to actively inform people of new information released for download and to share information gathered from the network;
- A 'free-access to information' policy to avoid financial barriers to participation.

We also suggest a suite of open source software tools that can be used and provide suggestions on technical issues critical to effective service delivery including:

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- User-friendly websites and electronic publications;
- Choice of distribution platform;
- Performance monitoring through log file analysis.

Future development of eNACA will focus on growing the user community and assisting NACA centers and other information providers to develop their own digital publishing capability and networking capacity.

Keywords: Aquaculture, website, multimedia, online community, content management

Introduction

The Network of Aquaculture Centers in Asia-Pacific (NACA) is a networking organization that promotes sustainable aquaculture. It has 16 member governments covering most of south and southeast Asia with a Secretariat located in Bangkok. NACA operates on the principle of technical cooperation between developing countries. Governments and participating research centers share their expertise and provide mutual assistance in order to avoid duplication of effort in research and training. NACA's main activity is the sharing of information.

The need for better networking

Until 2000 NACA conducted networking activities exclusively through traditional methods such as workshops, training courses, study tours, conferences and printed publications. As a highly decentralized organization with a relatively small budget the cost of international travel, communications and postage is the main constraint to networking and sharing of information.

Evolution of the NACA web portal: eNACA

In 2000 NACA established its first static website <http://www.enaca.org>. Public utilization of the site increased substantially with the addition of NACA's first online information services: An email newsletter and later free access to full-text publications. This, in conjunction with low access costs lead to an increasing reliance by staff on the web as a dissemination tool. Since then, the website has gradually evolved into a dynamic, community-based portal system hosting a virtual community and has become and an integral part of the network's communications framework, "eNACA". This paper is a summary of our experiences and lessons learned during the evolution of the system to date and its integration with our conventional media. The website has been developed using free, open-source software tools.

A multi-media approach

The website has become the core platform for NACA's information services. However, it is only one part of a larger integrated publishing system that incorporates a range of traditional and electronic media. NACA's stakeholders have widely varying levels of access to different kinds of media. Many still do not have access to the internet or even to a computer. It is therefore necessary to distribute network information in a variety of forms to suit people in different

circumstances. NACA policy is to distribute all publications in print, in electronic form as downloads from the website and on CD-ROM for offline access.

Print

Traditionally most network publications have been distributed exclusively in print. However, the cost of printing and international postage has been a substantial barrier to access due to the need to recover costs in the form of subscription fees and sales.

Email newsletters

NACA's first electronic publishing began in 1998 with the distribution of an email newsletter linking researchers participating in the Asia-Pacific Marine Finfish Aquaculture Network. The newsletter was used as an interactive medium in which researchers were encouraged to share the results of their work and to promote collaboration. Further subject-specific newsletters have since been added on a variety of subjects including shrimp farming and trade. These provide an effective way of maintaining a personal linkage between individuals and new resources on the website, creating incentive for them to visit and access material.

Web-based information services and digital library

With the development of the website NACA began to offer a range of online news and information services. The first substantial element was access to full-text electronic copies of network publications as downloads in PDF format for easy distribution. The collection has gradually evolved into a small digital library, which is by far the most popular service on the site. PDF files are optimized for easy download with a customized set of job options developed for Acrobat Distiller. The distribution of electronic publications began to exceed that of hard copies in the second year of operation. Presently, in the third year of operation, around 12,000 publications are being distributed via the website per month and hard copies form a clear and diminishing minority of circulation. Around 450 publications were available for download at time of writing.

A range of news services was subsequently added on various fields of aquaculture. The scope of coverage has slowly increased with time.

CD-ROM

A low-cost CD-ROM is released quarterly containing a full set of new NACA publications in PDF format in a HTML interface. This is primarily to cater for centers and individuals that do not have internet access.

Open access policy

The adoption of a free-access policy to electronic publications and services has been a key factor in the success of the digital publishing activities. NACA also encourages secondary copying and distribution of network publications and other information by partner organizations to their local networks. This further increases circulation since partner organizations often translate relevant content into local languages, and publish it in their local media. For example, the Agricultural Information and Communication Center of Nepal uses material downloaded from the NACA website in their regular radio and television broadcasts.

Cross-media linkages

Where possible we leverage different media off of one another to raise awareness of new resources. For example, the printed version of NACA's magazine *Aquaculture Asia* carries a column announcing new downloads and other developments on the website to stimulate interest. The email newsletters play a key role in raising awareness of new publications and other resources and in generating traffic to the website. The website log files show a large spike in visits and downloads for 2-3 days following distribution of a newsletter. This mutual value-adding effect of linking different media has become an important part of the NACA communications strategy.

Constraints to use of websites by agricultural organizations

Despite the benefits that websites and other ICT offer as additional tools their application by public sector organizations involved in aquaculture (and probably more broadly, in agriculture) has been very slow. We have observed that agricultural websites tend to be developed on a 'project' basis with no ongoing resources to maintain them once the initial construction is complete. Of the 35 centers currently participating in NACA around 22 have websites in place. However, most are static 'brochure sites' that provide contact details and background information. Only about six appear to be updated with any

frequency. At present, very few centers are actively using their website as a tool for the dissemination of news and information.

Two common constraints faced by agricultural research organizations were highlighted during the December 2003 meeting of the Asia-Pacific Association of Agricultural Research Institutes (APAARI). Many organizations reported difficulties in funding ongoing website development. A shortage of technical staff was another commonly reported problem, with the result that technical staff became a bottleneck in updating the website. In response to these issues there was a clear trend among participating organizations towards i) implementation of content management systems (CMS) that enable websites to be updated without need for technical IT skills and ii) decentralization of content submission and website management to non-technical staff.

Web publishing the easy way: Implementing a content management system

Previous versions of the NACA website consisted largely of hand-coded static html pages. As the website grew and staff supplied more content the site became difficult to maintain with existing staff resources. From an operational perspective our real interest lay in publishing the content as rapidly as possible. We decided to move to a content management system that would simplify publishing by handling page layout and formatting automatically.

The most recent version of the NACA website (V. 4) was constructed using the eXtensible Object Oriented Portal System (XOOPS), an open-source product available from www.xoops.org.

One of the main advantages of using a CMS is that it removes the need for technical knowledge to update a website, allowing non-technical staff to publish their own content directly or even manage sections of the website themselves. This increases the pool of staff available to contribute to the site and creates incentive for them to become involved.

Since content can be submitted and the site managed via a browser the content submission and management processes can be decentralized and staff can post real-time updates from the field or while traveling. Management of the NACA website has been 'handed back' to the programme staff, some of which are permanently out posted to India and Vietnam. This has freed the ICT staff to focus on purely administrative issues.

Lessons learned

Moving to a CMS created its own set of issues. It required a large change in the way the organizations internal workflow since submissions, and to a large extent management of the website, were delegated to non-technical staff with no prior experience in web publishing. With the involvement of more people in the publishing process we encountered early difficulties in standardizing our approach and in the presentation of information. One of the key issues that arose was the need for a strong, clearly defined editorial process in order to maintain quality control.

Performance monitoring and improvement

Targeting content more effectively

A key part of our website strategy has been striving to make the site as useful to people as possible with the aim of making it part of their daily routine, thereby increasing the exposure and uptake of our information resources. We have tried to adopt a demand-driven focus by looking at the kinds of information that people actually *want*.

Careful examination of website log files can provide a lot of useful information about visitors and their interests. We have been able to validate our assumptions about the kinds of information that visitors value by observing the kinds of information that they prefer to access. This has allowed us to identify and develop these services further, thereby increasing utilization of the site.

Log file analysis has also enabled us to detect interests that we did not expect. For example, we were surprised by the level of interest in job advertisements. Hosting job advertisements is not a significant interest of the organization but we continue to provide this service because it attracts visitors to the site who may access our core information services while they are there.

Improving structure and presentation

Log file analysis has also enabled us to improve the design of the website. Through observation of visitor reaction to changes in the site structure and the way information is presented we can gauge the effectiveness of changes – what is successful, and what is not. The gradual evolution of the NACA website towards a portal (flat, non-hierarchical) model has in large part been driven by the preferences of our visitors.

Establishing an online community

The most recent development in the NACA website is an attempt to establish an 'online community'. In a highly decentralized organization such as NACA this has enormous potential as a networking tool for information exchange and technical collaboration.

The XOOPS CMS is strongly oriented towards the construction of community sites. It has many features that allow visitors to communicate with one another including built-in discussion forums, and an integrated personal messaging system. It can also be configured to allow visitors a high degree of interaction with the site in terms of submitting their own content (news, events, publications etc) while retaining a high degree of editorial control. NACA encourages visitors to the website to submit local content that may be of interest to the wider network. A long-term goal is for the majority of the site content to be provided by external contributions.

Our goal in establishing the community is to encourage a diverse mix of individuals to participate. We do *not* seek to exclusively target NACA's traditional research network. One of the main strengths of online communities is in bringing diverse interests together and as a tool to break down the barriers between social groups - mixing farmers and scientists together; experts with the people practicing the technology. At time of writing the forums have only recently been implemented but early signs are encouraging.

Conclusion

NACA has pursued a multimedia strategy in distributing information to stakeholders. The addition of website information services and digital publishing to NACA's communications strategy has greatly increased the reach and distribution of network information while simultaneously reducing operating costs. Common constraints to the development of public-sector agricultural websites and information services include lack of ongoing funding support and technical staff resources. Implementation of content management systems can help overcome these issues. We believe that the future of web publishing in agriculture will increasingly involve decentralization and community based data input, management and ownership of websites.

Useful software tools

XOOPS Content Management System: Available for free download from
<http://www.xoops.org>.

Reviews and developments in CMS are available from the CMS Watch Website
<http://www.cmswatch.com>.

Acrobat Distiller job options for producing web-optimised PDF files are
available from:
<http://www.enaca.org/modules/mydownloads/singlefile.php?cid=108&lid=517>