Development of an African repository for electronic publications

Project Proposal for Submission to the Government of Flanders (FUST 2004-2007)

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Intergovernmental Oceanographic Commission
(of UNESCO)

Government of Flanders

1. Goal

Development of a platform for electronic publication in Africa with a focus on ocean (and coastal area) research and management.

2. Introduction

The Internet creates the opportunity for publishing on a large scale. Commercial publishers have adapted themselves to the new medium. But also new forms of publishing are developed. Universities and scientific institutes are taking the publishing process in their own hands. A new model of publishing is based on local collections (repositories) made accessible through the OAI[1]-protocol.

The creation of an African (ODINAFRICA) repository will have the following immediate and direct advantages:

(i) make documents more easily accessible to the African Ocean (and coastal area) research and management community, which will enhance the internal scientific communication;
(ii) facilitate publishing of research findings by African scientists (e-journal as well as e-archive) thereby promoting African research and increasing access by African scientists to the international research forum.

A feasibility study for the creation of a repository has been conducted. In the draft report (available in Annex) the opportunities of a repository project for ODINAFRICA are fully described. The current proposal is based upon the conclusions of this study: a project to create pilot e-collections of scientific documents for ODINAFRICA.

3. Objectives

The project will have the following objectives:

- **Development of an OAI-compliant e-repository providing access to full-text knowledge items available in African ocean libraries and information centres, partners in ODFINAFRICA**. These may include scientific articles, theses, reports and other published or unpublished (grey literature) materials, available in full-text electronic form.
  Rationale: During the ODINAFRICA-II project all participating ocean libraries were provided with the INMAGIC Integrated Library Management System (ILMS) software. All libraries built their in-house library catalogue using this software (and using a standard format). After quality control the records of all libraries were merged into the AFRILIB library catalogue available on the IOC/ODINAFRICA web site. This data base includes records

[1] Open Archives Initiative (http:// www.openarchives.org)

on all (paper) publications (monographs, reprints, photocopies of articles, journals, theses, etc) available in the libraries. The system does not provide full-text access to these objects. Accordingly to obtain the full-text version of the objects interlibrary loan requests need to be sent to the holding library.

- **Provide a platform facilitating the development of Africa e-Journals** Rationale: on many occasions African scientists have expressed their concern about their difficulty in publishing their research findings in international journals. Several attempts have been made by various institutions and organizations to start the publishing of African ocean journals in print form. Most have failed due to the lack of interested publishers, limited market potential and other business related reasons. E-journals are able to bypass the need for commercial publishers. This model has proved itself for various disciplines (eg physics, mathematics, etc).

4. Deliverables

1. A test server will be set up at LUC.
2. A platform for electronic publishing, which is in accordance with the OAI-protocol. The metadata will be made exchangeable with the ODINAFRICA catalogue.
3. A training package will be created (and will be inserted into ODIMEX system) for current and future participants in the project.
4. A pilot collection of electronic documents will be created (reports – archived articles – an e-journal collection).

5. Methodology

5.1 Software platform

Several software platforms currently exist for e-repositories, many of which are experimental. The most used are Dspace (http://www.dspace.org/)and Eprints (http://www.eprints.org/).

- **DSpace** is a groundbreaking digital library system to capture, store, index, preserve, and redistribute the intellectual output of a university's research faculty in digital formats. Developed jointly by MIT Libraries and Hewlett-Packard (HP), DSpace is now freely available to research institutions world-wide as an open source system that can be customized and extended;
- **eprints.org** is part of the Open Citation Project, a DLI2 International Digital Libraries Project funded by the Joint Information Systems Committee (JISC) of the Higher Education Funding Councils, in collaboration with the National Science Foundation. EPrints software has been created so that institutions can create OAI-compliant Archives quickly, easily and for free

An important element in the choice will be the possibility of metadata exchange with the ODINAFRICA catalogue (InMagic) (see 3.Objectives)

5.2 Document types

The different sort of document collections will be tested:

1. Grey literature – reports,
2. Archiving of the articles of a regional scientific journal
3. Starting an active collection for an e-journal.

6. Partners

- The research, development, the set-up of the repository server and the administration will be done by LUC (Limburgs Universitair Centrum Diepenbeek, Diepenbeek, Belgium) library.

- The creation of content is the task of the institutes and organizations participating in the pilot project (ODINAFRICA-III Partners). Note: *the e-repository sub-project has been identified by the ODINAFRICA Conference (Brussels, September 2003) as a priority activity.*

7. Work Plan & Timetable

1. Technical preparation (6 months, year 1)
   - Choice of software, which will be adapted to the needs of ODINAFRICA
   - Purchase and Installation of hardware and software
   - Synchronisation of the repository with the ODINAFRICA catalogue: exchange/transfer of metadata records to repository

2. Training of African Partners (2 weeks, year 1)
   - Starting with a limited number of participants (possible partners: KMFRI-Kenya, IMS-Tanzania, WIOMSA with WIOJMS-journal, African Journal of Marine Science (S. Africa), Document Scientifique du CRODT - Archive Scientifique du CRODT (Senegal), …)
   - Possible collections: existing journals, archives of existing journals, reports
   - Field visit as necessary

3. Operational phase (18 months)
   - Adoption of a policy and administrative rules for the repository
   - Adoption of a policy for copyright and access (these can be different for every collection)
   - Uploading documents in the collections

4. Evaluation of the project (end of Year 2)
   - Evaluation of results
   - Recommendations for further work
   - Possible transfer of hardware and software to African host institution

Timetable

	2004	2005
WP1: technical preparation	■■■■■■□□□□□□	□□□□□□□□□□□□
WP 2: training	□□□□□□■□□□□□	□□□□□□□□□□□□
WP 3: operational phase	□□□□□□■■■■■■	■■■■■■■■■■■■
WP 4: evaluation	□□□□□□□□□□□□	□□□□□□□□□□■■■

8. Budget

(US Dollars)

	2004	2005	Total
WP1: Technical preparation	10,000	2,000	12,000
WP 2: Training	35,000	20,000	55,000
WP 3 Operational phase	12,000	12,000	24,000
WP 4: Evaluation	0	10,000	10,000
SUB-TOTAL	**57,000**	**44,000**	**101,000**
Overhead UNESCO (10%)	**5,700**	**4,400**	**10,100**
GRAND TOTAL	**62,700**	**48,400**	**111,100**

9. Counterpart contributions

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	2004	2005	Total
TOTAL	**17,000**	**5,000**	**22,500**

IOC (IODE Project Office, Oostende, Belgium)

	2004	2005	Total
TOTAL	**5,000**	**5,000**	**10,000**

African Partners: contribution will be part of the ODINAFRICA-III counterpart contribution as detailed in the ODINAFRICA-III proposal.

ANNEX

E-journal access and e-publishing in Odinafrica: Intermediate report

August 18, 2003

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1- Goals

Scientific e-journal collections will be available as a result of negotiations with commercial publishers (and other organizations involved in e-publishing). This literature will be accessible through an Odinafrica-directory of full text literature. An information strategy about e-journal access will be delivered with proposals of an organizational structure for e-journal access in Odinafrica. This included some training at the MIM-sessions in September 2003.

A feasibility study will be delivered about the possibilities of e-publishing in Odinafrica. The study will mainly focus on the creation of an Odinafrica repository:

- Evaluation of the software for repositories
- Survey of the necessary and available conditions to start a repository / e-journal for Odinafrica
- Planning an information strategy for potential users

2- General approach

My basic assumption is that the Information Centres of Odinafrica are not homogeneous and need a specific approach, depending of the availability of infrastructure, knowledge, communication possibilities and scientific output.

The consequence of this assumption is that, for better results, Odinafrica needs a different level approach for e-journal access, creation of a repository and e-publishing facilities and even for MIM-training. But at the same time every partner has a right to have access to services of equal quality. We have to develop a strategy to supply every partner with quality services, which can be different depending on their needs and capacities. (Already in the RECOSCIX projects different roles were assigned to the participating institutions.)

To evaluate the opportunities available in Odinafrica, I started to collect information about the different information centres. Therefore I used three sources:

- The national reports of the different Odinafrica members
- The answers to the questionnaire, which was send to all the information centres managers
- The result of my visit to KMFRI, Mombasa and IMS, Zanzibar.

The next table 'Library capacity and communication infrastructure' is derived from these resources. It is a starting point for analyzing the opportunities and the

problems in realizing the objects of this report. Table: Library capacity and communication
infrastructure

Name	(CNDO) / Benin	MINREST-IRAD, Cameroun	CNDRS, Comores	CRO - Côte d'Ivoire	UOB - Gabon
Library capacity	540 books / 5 journals / 70 CD-roms in marine science collection	2000 books / 10 journals / 4 CD-roms in a general collection	3000 books in a general collection	20000 books / 800 journals / 10 CD-roms in marine science collection	23000 book / 600 journals in a general collection
	IC not described - National Report 02	IC not defined separetely of the Data Center in National Report 02	IC not described - National Report 02	nill	nill
Informatics infrastructure	1 PC - institutional network	1 PC - shared with data center	3 PC's	2 PC's in library network	8 PC's in library network
Internet infrastructure	1 PC - modem (+20kbps) - fixed rate	nill	1 PC - modem (+20kbps) - rate: ?	2 PC - modem (-20kbps) - rate: $ 1-3/hour	O PC - fast connection (?)
	MFRD, Ghana	Cerescor, Guinea	KMFRI, Kenya	CNDO, Madagascar	SDIS, Mauritanie
Library capacity	7427 books / 8 journals / 11 CD-roms in marine science collection	4500 books / 5 journals in a general collection	+5000 books / 122 journals / 60 CD-roms in marine science collection	2660 books / 65 journals / 4 CD-roms in marine science collection	9000 books / 95 journals in marine science collection
	Restructuring IC/Library (NR 02)	IC/Library established Nat. Report 02	IC/Library established Nat. Report 02	IC not described National Report '02	Library established National Report '02
Informatics infrastructure	1 PC - institutional network	5 PC - library + institutional network	3 PC - library + institutional network	4 PC - library + institutional network	2 PC - library + institutional network
Internet infrastructure	6 PC - modem (+20kbps) - rate: ?	1 PC - modem (+20kbps)/satellite - fixed rate	+10 PC - leased line (32 kbps) -fixed rate	14 PC - modem (-20kbps) - rate: ?	2 PC - fast connection - fixed rate
	AFRC, Mauritius	Bibl. Centrale - Fac. Sciences - Rabat, Morocco	INAHINA, Mozambique	NIOMR/LIBRARY, Nigeria	BD - Direct. Pêches Maritimes, Senegal
Library capacity	2000 books / 200 journals / 13 CD-roms in marine science collection	9250 books (200 marine science) / 8 journals / 35 CD-roms in a general collection	1102 books / 81 journals / 18 CD-roms in a general collection	5700 books / ? Journals+cd-roms in marine science collection	6800 books / 65 journals / 18 CD-roms in marine science collection
	IC not described National Report 02	nill	IC: Only since 2001 hosted by INAHINA	Library established National Report 02	Library established National Report '02
Informatics infrastructure	2 PC - library network	8 PC - library (exp.) + institut. network	1 PC - institut. network	6 PC - library network	3 PC stand alone
Internet infrastructure	1 PC - modem (+20kbps) - rate: $ 1,6/hour	institut. fast connection (256k) - fixed rate	1 PC - modem (+20kbps) - rate: ?	3 PC - modem (<20kbps) - fixed rate	? PC - modem (+20kbps) - fixed rate
	DC - Fish. Authority, Seychelles	MCM - South Africa	CNDO, Togo	Bibliothèque - INSTM, Tunisia	IMS, Zanzibar
Library capacity	3265 books / 48 journals / 2 CD-roms in marine science collection	6159 books / 880 journals / 6 CD-roms in marine science collection	1000 books / 2 journals / 7 CD-roms in a general collection	10000 books in marine science collection	3500 books / 10 journals in marine science collection
	Library established National Report 02	Library established National Report 02	IC not described National Report 02	Library/IC established in 01	Library established National Report 02
Informatics infrastructure	2 PC - institut. network	5 PC - institut. Network	? PC - library + institut. network	3 PC - library + institut. network	3 PC - institut. network
Internet infrastructure	2 PC - modem (64kbps) - rate: $ 8/hour	3 PC - fast connection - fixed rate	PC - modem (+20kbps) - rate: ?	PC - modem (<20kbps) - rate: ?	33 PC - leased line (64kbps) - fixed rate

The extent of the library collection and the origins of the information centres gives a good indication about the availability of library facilities. The quantity of the books ranges from less than 1000 to 20000 volumes, sometimes in a specific marine science collection, sometimes in a general library collection. Some of the information centres have already a history; others are only established since or even after the start of the Odinafrica program.

There is a library tradition and an extensive collection in Côte d'Ivoire, Ghana, Guinea, Kenya, Mauritania, Nigeria, Senegal, Seychelles, South Africa, Tunisia and Zanzibar. There is only an embryonic structure and limited collections available in Benin, Cameroon, Comoros, Madagascar, Mauritius, Mozambique, Togo. The information about Gabon and Morocco, where the superstructures seems to be very good but where the information centres of Odinafrica are not really working, makes it difficult for me to bring them in one of both groups.

This is a very rough division. I don't have taken into account the quality and the actuality of the collections. Generally spoken the acquisition possibilities seem limited in the last years for all institutions involved.

Can the information centres rely on the own collection to sustain the work of the marine institutes? Many institutes can rely on a library infrastructure to have access to (a part of) the scientific literature, but for all of them more access to scientific literature is necessary. There are now some alternatives for journals, clearly the most underdeveloped part of most of the collections. Besides interlibrary loan access is becoming available through the Internet. At the same time information managers can help in developing the existing knowledge base of an institution through the creation of a repository or electronic library.

Information managers will have to learn, besides the classical librarian tasks, to deal with electronic resources - accessing and creating electronic documents. Depending on the library capacity of the information centre, the information managers have to focus on different tasks. Realizing access to scientific information is the goal of both groups. While the first has a task in consolidating the collection – classical librarian tasks have to be trained, the second group has to focus on external resources by using ILL and access to e-resources.

The most important bottleneck that everybody is aware of is the limitation of the communication infrastructure. It is clear that some Odinafrica partners will have problems to consult e-journals sites and download articles because of the bandwidth limitations. Information centres, which can rely on a better Internet access, will have to play a role of disseminator in the region, while others will be simple users.

The key for access is a good Internet connection: A full text article has a size between 200Kb and 1Mb.

Download time document:	1 Mb	0,5 MB
128 kbps	1'50"	0'55"
- Good : 64 kbps	3'40"	1'50"
- Medium: 32 kbps	7'20"	3'40"
- Bad : 14.4 kbps	16'	8'

The stability is also an important element to define the quality of the connection. Different reasons can slow down the connection. The chance to lose the connection is also greater with small bandwidth.

This gives us the following categories:
Good : Guinea (when the satellite connection will be installed), Kenya (when the 64 kbps connection will be installed), Mauritania, Morocco, Seychelles, South Africa, Tanzania
Medium: Benin, Comoros, Ghana, Mauritius, Mozambique, Senegal, Togo,
Bad: Cameroon, Côte d'Ivoire, Madagascar, Nigeria, Tunisia
? : Gabon

I believe it is a priority to resolve the access problems. Generally access at 64 kbps should be the objective. The institutes with bad connections will have serious problems to access the electronic journals. Even electronic ILL will be difficult. Participating in an Odinafrica repository will be problematic. The situation of Cameroon, without any Internet access at the moment, is very concerning because it isolates them from the rest of Odinafrica. But at the same time connection possibilities are growing in Africa. I hope that the efforts of Odinafrica to realize better access will be fruitful in the next months already.

Relying more on external resources will have some new expenses as result. The use of Internet for accessing or creating electronic documents will bring some new costs for institutes, which doesn't have fixed access rates (e.g. Extra access of 1h/day for 200 working days/year in Seychelles: $ 1600, in Côte d'Ivoire: $ 400).

3- Accessing electronic journals and their articles

To get access to marine science journals through the Internet, Odinafrica had to contact some major publishers. While already some projects, PERI and eJDS in the first place, make journals available for institutions in different countries in Africa, it was our option to make an agreement with different publishers specifically for Odinafrica. Therefore we started to negotiate with two publishers, Elsevier and Wiley. In an e-mail on May 16, they were asked for the conditions to get access to their marine science titles through a dedicated platform, which should make access for the Odinafrica partners easier.

Both publishers reacted positively and promised to study the proposals. The results are positive in a way, but are not in the line of our proposals. Mr. Leo Voogt from

Elsevier gave us the information about a major project AGORA that will be launched in October 2003 for a period of minimal 3 years. AGORA is the result of negotiations between FAO and some major scientific publishers: Blackwell Publishing, CABI, Elsevier, Kluwer Academic Publishers, Lippincott, Williams and Wilkins, Oxford University Press, Springer Verlag, and John Wiley & Sons. It will build on and share the infrastructure of a similar programme serving the health sector called HINARI, which was launched in January 2002 by WHO.

The journals in agriculture and related biological, environmental and social sciences of these publishers will be available for low-income countries through a dedicated website. More than 100 titles related to marine science (fisheries, biology, environment, …) will be available through this platform.

There is also a negative part in the answer of Mr. Leo Voogt. Elsevier does not envision developing a special project in the area of oceanography at the moment. This means that journals in the field of geology, chemistry will not be available through the project. The AGORA collection will not be available for a few countries with higher income levels. The institutes of Odinafrica in Gabon, Mauritius, Seychelles and South Africa cannot make use of the AGORA services at the moment. At the beginning of the negotiations we hoped to realize a dedicated platform for Odinafrica. In the actual situation, this is not possible. If Odinafrica wants to realize these objectives further negotiations are necessary.

The contacts with Wiley are not concluded. Access to a part of the collection will be possible through the different existing projects. For access to specific titles there was a problem of price setting. I think it will be interesting to hear about the price policy of a commercial publisher. Because at the moment institutes in low-income countries will get access to a part of the collection, one way or another. This can give the impression that institutes don't need to make any financial effort to get access to these resources. On a longer term a budget will be needed for this literature. Institutes have to be aware of this fact.

In the following table the availability of electronic journals is indicated for the different countries in Odinafrica.

Table: Journals in marine science - Availability/country in different programs

	Free	AGORA	PERI	eJDS		
Benin	X	X	2 titles	X	Free	44 titles
Cameroon	X	X	X	X	AGORA	± 120 titles (*)
Comoros	X	X	2 titles		PERI	102 titles
Côte d'Ivoire	X	X	X	X	EJDS	14 titles
Gabon	X					
Ghana	X	X	X	X		
Guinea	X	X	2 titles	X		
Kenya	X	X	X	X		
Madagascar	X	X	2 titles	X		
Mauritania	X	X	2 titles	X		
Mauritius	X					
Morocco	X	X (*)				
Mozambique	X	X	X	X		
Nigeria	X	X	X	X		
Senegal	X	X	X	X		
Seychelles	X					
South Africa	X		X			
Togo	X	X	2 titles	X		
Tunisia	X	X (*)				
Zanzibar	X	X	X	X		

Many institutes are creating their own journals, which are available in open access. We have traced 44 titles, which could be interesting for the Odinafrica community. Through a large project as AGORA (web address not yet available), HINARI (http://www.healthinternetwork.net/), PERI-INASP (http://www.inasp.info/peri/countries/), EJDS (http://www.ejds.org/index.php) major commercial scientific journals are becoming available.

The 'Directory of Odinafrica eResources' is a survey of the available e-journal titles for Odinafrica. In an excel-file you can find the necessary information to access the journals. This information will be included in the OceanTeacher website. I think that it has to be integrated in the InMagic catalogue of Odinafrica. There will be an overlap with the OceanPortal information, but the focus on Odinafrica creates added value, which can't be integrated in OceanPortal.

To access the articles available on the Internet, I propose a straightforward workflow.

1. Consultation of databases and search engines
   The basic tool to find literature in marine science is ASFA, which is available for all Odinafrica partners on the web and for those institutes with limited Internet capacity on CD-ROM. Other interesting databases and search engines are Ingenta (http://www.ingenta.com/) and Scirus (http://www.scirus.com/). These Internet search engines are freely available. The users have to be aware that only the metadata are freely available. To

access the articles through "pay per view" can be very expensive.

2. Controlling the availability of a journal by consulting the 'Directory of Odinafrica eResources'
   After consulting ASFA or another database, the availability of the journal has to be checked in the 'Directory of Odinafrica eResources'. (If the publishers allow it, direct access from the search engine is also possible. Then the control step is not necessary)
3. Accessing the e-articles
   Information Centres with medium to good Internet capacity can access directly the journals of the 'Directory of Odinafrica eResources', if their institution has made the necessary registration. Access will be regulated by IP-control or by using a password. IP-control is more user-friendly.
   Some of the countries in Odinafrica will have problems to access these resources because they have only limited Internet access: Cameroon, Côte d'Ivoire, Madagascar, Nigeria, Tunisia and Gabon (?). Institutions in these countries will have the possibility to request the electronic document in a distribution centre. The distribution centres will download the e-article and deliver it by e-mail or by post. In fact, it is an extension of the ILL service. Mombasa and Abidjan have experience in interlibrary loan. At the moment the institute in Côte d'Ivoire has herself limited internet capacity and also KMFRI, Mombasa has to upgrade her connection if they want to deliver a good service. The answers on the inquiry indicate that Mauritania, Morocco and Tanzania could also take a distributor role. The institutes in the Seychelles and South Africa have also the necessary Internet capacity but they will probably not have access to these special programs.
   For this distributor role we will need the agreement of the publishers, because electronic distribution is against the existing copyright laws. Also the administration of the costs of the Internet access, mail and personnel has to be taken into account.

Access to e-journals will not replace ILL completely. If we look at the figures of delivered documents only Guinea, Tanzania, Seychelles and surely Kenya made extensive use of this way of accessing literature. Hopefully, access to e-journals will be a new stimulus for all Odinafrica countries to use the literature in marine science.

Therefore a training of the information managers will be necessary. A first acquantance with the different resources will be possible at the MIM training in Brussels in September 2003. Because AGORA will only be available in October and the fact that the negotiations about the copyright aspect of the distributor role will probably not be completed, in-depth training will only be possible in Odinafrica III.

Training should be focused on the

- The registration to the different journal connections
- The implementing of the proposed workflow
- The organisation of the access in the institution: depending on the capacity of the different institutions it will be possible to give access to the individual scientists (they have to be trained) or to limit access to the librarians (even then,

scientists have to know how to work together with the librarian). In the end not only the information managers but also every researcher in the institute has to be informed about the accessibility of e-journals.

4- E-publishing

(a) Repositories

Goal

The Internet creates the opportunity for publishing on a large scale. Commercial publishers have adapted themselves to the new medium. But also new forms of publishing are developed. Universities and scientific institutes are taking the publishing process in their own hands. A new model of publishing is based on local collections (repositories) made accessible through the OAI-protocol.

The creation of an Odinafrica repository will make documents more easily accessible for the Odinafrica community, which will enhance the internal scientific communication. At the same time by adhering to the OAI-protocol, the activity and productivity of Odinafrica will become visible to the international marine sciences community.

Which are the necessary conditions to create a repository for scientific publications in Odinafrica and take part to this open network of scientific information?

Evaluation Software

To start up a repository, different software packages are being developed by universities and scientific institutions as open source software. These packages are based on Linux and other free software. The most interesting are ePrints (University of Southampton), Dspace (MIT) and CDSware (CERN).

Comparison ePrints – Dspace - CDSware:

- They are equivalent in possibilities, all have similar workflows and search options.
  - Database for bibliographic description (metadata + original document)
  - Web-interface to access the collection with full text documents
  - Web-interface to upload new documents in the database (with workflow options: control of the document – control of the metadata)
  - They are all OAI-compatible which makes the repository available through search engines.
- The products are all based on the same sort of software (open source - Linux)
- In ePrints the metadataset can easily be adapted. This can be necessary if Odinafrica chooses another metadataset than Dublin Core Unqualified.
- Dspace is the newest product. The interfaces for the user and the administrator are very user friendly. The structuring of the repository in communities and collections is an interesting feature for Odinafrica: Information centres can be defined as communities, while the sort of publication (reports, articles, published articles, …) can be seen as collections. I have seen similar features build up in

ePrints, but they are not standard available. The use of a persistent identifier is also a nice feature.
- Like different other organisations (Theses Alive – GB, Erasmus University Rotterdam) I think that it is easier to start a repository with Dspace. But other elements can influence the choice, which is not a problem because the quality of the different software packages being nearly on the same level.
- A last option is to work further on databases used in Odinafrica (e.g. AfricanOceans.Net) and make them OAI-compatible.

The use of standards

In a repository the full text documents are uploaded and coupled with a bibliographic description, the metadata. Odinafrica will have to choose the standard for the metadata, the descriptors and for the document.

The minimal metadataset for OAI compatibility is Dublin Core Unqualified, which is available in the different software packages. It will be necessary to use other sets only if the marine science community proposes an extended metadataset.

It is also important to choose a standard for the descriptor field. During my study visit in Mombasa and Zanzibar, librarians and researchers preferred the ASFA descriptors to UDC, DDC or LCC.

The articles and reports are most of the time originally produced in Word. This is not a stable format to archive a document. The most popular way of presenting a document is PDF. But even in PDF a document can be unreadable in maybe 10 years. Therefore XML is proposed as a new stable standard, but it is unfortunately not implemented already. Therefore PDF seems to be the best workable format at the moment. Well-structured documents, on whatever sort of software, will have the longest life.

Necessary and available conditions to start a repository for Odinafrica

In the Odinafrica context, it is more practical to start with a central repository where the different centres can archive their documents. Theoretically it is possible to start with a repository for every institution in Odinafrica, but this makes the project too complex and too expensive. In the Odinafrica repository project participants can play different roles: host, administrator, uploader, user.

The hosting of a repository server means the technical follow up of the repository server. A small server or even a PC with backup possibilities can do the job. The software is Linux based (Open Source Software). The Internet connection has to be at least 128 kbps and has to be very stable. For the security of the data a firewall has to be installed. Smoothwall (also Open Source Software) proposes a fine and not expensive solution. The host organization has to support the Linux environment.

The administration tasks are:
- Setting up of the collection structures: For every Odinafrica partner an entry has to be set up, which links to their different collections (e.g. reports, articles, …)

- Setting up of a repository policy: which documents can be accepted, how the control will be organized, a copyright policy
- Delivering the access rights on the electronic platform (reader – uploader – control - administrator)

The uploading of the documents is the task of the local Odinafrica partners. They have to organize the local workflow:

- Scientist deliver their publications
- Control of the content
- Publications are converted to standard format(s): pdf – XML
- Metadata is added – keywords (ASFA ?) are added
- Control of the metadata
- Final Acceptance

The workflow can differ from institute to institute. But scientists and librarians will play a role. Both groups have to be involved in the upstart of the project.

Every institution or individual researcher in the world can be a user of a future Odinafrica repository. The first audience are the institutes and researchers in Odinafrica. Through a repository hopefully Odinafrica can present her research results and capacity to the whole marine science world.

Implementing an Odinafrica repository

The Hosting of the server can be done in Europe. Possible institutions to host the repository server are besides UNESCO – IOC, University of Southampton - Institute of Marine Science and LUC Belgium. Southampton has always strongly been involved in Odinafrica through the person of Pauline Simpson. Also Stevan Harnad and the members of the department of Electronics and Computer Science Department are forerunners in the open access movement for scientific literature. They developed the ePrints software, which is used by many institutions to establish a repository platform. There is a lot of knowledge about OAI-compliant repositories available. LUC Belgium has been involved in RECOSCIX and ODINAFRICA since nearly 15 years. We propose to share our experience while building the LUC repositories.

The advantage to start a repository in Europe is the stability of the Internet services. The people of Odinafrica I met in Mombasa and Zanzibar, preferred to host the server in an African country. The advantage is that expertise will be build up in Odinafrica. But can a stable hosting and Internet connection be guaranteed?

Different countries have shown in the inquiry interest in setting up a web server and taking the hosting role: Kenya, Mauritania, Morocco, Madagascar, Tunisia and Tanzania. The Internet capacity and the stability of the information centres limit the candidates to 2 or 3 countries (Mauritania, Morocco and Tanzania). Having seen the realisations in Zanzibar, I think IMS is a possible candidate. They have already experience with a local web server at the institute and with an administrator's role for AfricanOceans.Net. They will be able to host a repository when the bandwidth will be enlarged to a stable 128 kbps minimum, when security problems will be

solved by the installation of a firewall (e.g. Smoothwall – Open Source Software) and when the support for running the server (hard- and software) is locally available. This can be a serious option in the end. I cannot express myself about the capacity of the countries in West Africa. I didn't have the opportunity yet to visit their centres.

For the administration of the repository IMS, Tanzania is the best candidate. They already have experience in the administration of the AfricanOceans.Net and in the set up of a web server.

All the institutes that answered the questionnaire are interested to do the upload of the literature. For a good workflow 64 kbps is necessary. Even below 32 kbps uploads can be done, but then processing the information will go slow and sometimes fail. As for the access to e-journals there is a problem for the countries with bad Internet connection: Cameroon, Côte d'Ivoire, Madagascar, Nigeria, Tunisia.

Kenya (with a bandwidth of 64 kbps) or Tanzania in East-Africa and Ghana, Guinea, Mauritania or Morocco in West Africa are possible intermediate centres, which can upload documents for centres with problematic access.

The Odinafrica Repository Collection

Different types of documents can be a part of the repository collection: new articles, published articles (because of the copyright issue, this can be a problem), reports, working papers (only available for a limited audience), photo material, …. Reports are the easiest documents to start with.

It is important to start with a critical mass of documents to make the repository attractive to the users. Therefore a special effort is needed to upload documents of the last five years. From different institutes, we got an extensive publication list. These scientists publish reports, working papers and articles in local, regional and international literature. We propose also to convert the locally published articles to an electronic format. In that way they could be uploaded in the Odinafrica repository and become available for the whole Odinafrica community. Already some of the editors accepted that the articles could be integrated in the repository.

Table: Existing journals – starting point for an Odinafrica repository

Benin	Les Nouvelles du CBRST
Comores	Yamkobé
Gabon	La revue de L'IRSH
Guinea	Bulletin du CERESCOR
Mauritania	Bulletin scientifique de l'IMROP
Mauritius	Indian Ocean Tuna Commission (IOTC) Proceedings
Senegal	Doc. Scientifique du CRODT - Arch. Scientifique du CRODT
South-Africa	South African Journal of Marine Science / African Journal of Marine Science
Togo	J. Rech. Sci. Univ. Bénin - Revue du document de synthèse, Projet

	CNCC
Tunisia	Bulletin INSTM
WIO	J. Mar. Science

Training and support of librarians and of scientists

Starting a repository project affects not only the information managers. Setting up a workflow in an institute is a managerial task. Scientists are the key persons in the whole process, because without publications there is no repository. These groups have to be involved in the preparation of an e-access and e-publishing project. Specific training is also necessary for administrators and host organizations of a repository.

The rights of the authors have to be protected. Also the possibilities to publish in high quality journals have to be protected. The evolution of publisher's policy about copyright has to be followed up for the sake of the authors. A repository policy has to be written. This can be adapted for every collection separately. (e.g. inclusion of published articles has to be in accordance with copyright agreements. Negotiation with publishers can be necessary. Continuous availability has to be guaranteed.

Long term archiving

Long term archiving is the task of National libraries for National publications, for international publications it is the task ofinternational organisations. IOC maybe can take up this archiving task.

(b) Repositories and e-journals

As previously described a repository can be used to make existing articles electronically available. But a repository is also a good starting point for an e-journal. Articles are posted on the Odinafrica repository. Interesting articles can be selected for being included in the e-journal part. The refereed and revised article is added to the e-journal section of the repository. In that way the database to stock the articles is available for the e-journal. The upper layer of the e-journal can be a simple collection of web pages. The policy of the journal can be independent of the policy of the repository.

The availability of a repository creates possibilities for an e-journal. But the policy of an e-journal can be very different than that for a repository. This has been discussed with Dr Francis Julius of WIOMSA. They are interested in launching an e-version of their journal. Different guidelines for starting with e-journal publishing are available on the web: BOAI (http://www.soros.org/openaccess/oajguides/index.shtml), INASP (http://www.inasp.info/psi/ejp/essay.html), SPARC (http://www.arl.org/sparc/GI/).

Electronic publishing creates many opportunities because printing and distribution is not anymore a problem. But the other aspects are still the same. The marketing and financing of the product are still major challenges.

Different policy choices have to be made:

- Will it be an e-only or will there also be a paper version of the journal?
- Will the journal be free available or will it be based on subscriptions?
  - Free means that an alternative way of financing is necessary (A fee can be asked for the administration cost for the printing of an article)
  - A journal based on subscriptions involves administration and marketing costs
  - An embargo policy is necessary for the articles of a subscription journal (articles become available for everybody after a delimited period in which they are only available for subscribers of the journal)
  - An e-journal doesn't have to stick on the serial model.

Odinafrica will have to make the choice to build further on existing journals or to create a new e-journal for Odinafrica.There is a basis available to start an Odinafrica e-journal. The inquiry responses emphasize this fact. But will it be based on existing journals like Western Indian Ocean Journal of Marine Science (WIOMSA – East Africa) and similar journals in West Africa or will there be a new three lingual journal for Odinafrica?

Many candidate editors for such a journal have been proposed in the questionnaire responses:

Benin	Djiman Roger, Degbe Georges, Guendehou Sabin, Sohou Zacharie, Gbaguidi Amélie
Cameroon	Folack Jean, Djama Theodore, Gabche Charles E
Comores	Yahaya Ibrahim, Ahmed Abdoulkarim, Abdou Raouf Echata, Said Ahamada, Hamid Sooulé, Saïd Hassan Mohamed
Côte d'Ivoire	Sankare Yacouba, N'Goran Ya Nestor, Abe Jacques
Gabon	Dr.K.A Koranteng, Mr.Kofi Amador, Mr.Richmond Quartey, Mrs Comfort Akomea-Adu, Mr. S.N.K Quaatey
Ghana	Dr. K. A Koranteng, Mr.Kofi Amador, Mr.Richmond Quartey, Mrs Comfort Akomea-Adu, Mr. S.N.K Quaatey
Guinea	Sékou Cisse, Zoumana Bamba
Kenya	Dr. Kazungu, Dr. Kairo, Dr. Ruwa, Dr. Mutua
Madagascar	Gahidï M. Masimana, Fabrice Mamitiana , Norbert Andrianarivelo, Thierry Lavitra, Lantoasinoro R. N.
Mauritania	Inejih Cheikh Abdallahi, Wague Abdoulaye
Nigeria	R. Folorunso, S. Adegbe, A. B. Williams
Senegal	no names
South-Africa	Dr Stan Pillar
Tanzania	Dr. S.M. Mohammed, Dr. D.C.P. Masalu
Tunisia	Othman Béji

5- Conclusions

1. The bandwidth for internet access is essential for the realization of access to e-resources and for the creation of a platform for e-publishing:
   - Downloading from e-journals: good access: 64 kbps – limited access: 32 kbps
   - Hosting a repository: minimal 128 kbps + stability + security
   - Administrating a repository: minimal 64 kbps
   - Uploading/downloading on a repository: 64 kbps – limited access: 32 kbps – stability for upload
   - To take part effectively to these e-projects many Odinafrica partners will have to upgrade their internet connection to minimal 32 kbps.
2. Through different programs (AGORA, HINARI, eJDS, INASP, Open Access Journals) many interesting journal collections of major publishers are becoming available for low-income countries. The Odinafrica partners can use these opportunities to access an important part of the scientific literature. All the titles about marine science available for the whole community or for an important part of it, are being integrated in a Directory of Odinafrica eResources. In the end the best way to integrate this collection in the information structure of Odinafrica is by adding it to the InMagic catalogue. Training for information managers, but also for the end users (researchers) is necessary to introduce these new resources.
3. An Odinafrica repository can enhance the scientific communication between the Odinafrica partners and make the scientific research in the Odinafrica region visible for the marine science community. The necessary software is available. But choices have to be made about the place to host a repository server: in Europe or in Africa. A structure and workflow organization has to be developed. The necessary know-how has to be build up. Training and support for hosting, administering and using the repository will be necessary. All sort of electronic documents can be stocked in a repository. Articles, reports and working papers are the first sort of documents to collect. It is important to create from the beginning a large literature collection. Without a critical mass of documents the repository will not be attractive. It is also necessary to realize a support service for librarians and publishing scientist. Also the problem of long-term archiving has to be solved.
4. An Odinafrica repository is a good starting point for an Odinafrica e-journal. But the relation between such an e-journal and the existing journals has to be defined.
5. Not only librarians, but the management of the Marine Centres and the scientists/authors have to be involved in the project:
   - The management is responsible for the development of a policy related to e-access: the realization of the necessary infrastructure, the creation of a framework for use of e-resources and the creation of framework for publishing on a repository and in Odinafrica e-journal(s). Publishing in a Odinafrica repository/e-journal should be made mandatory or at least strongly recommended.
   - Scientists have to know how to access the available e-resources. Depending on the policy of the institute they will have the possibility to access directly

the resources or by the mediation of librarians. Authors scientists are the central persons in the creation of an Odinafrica-repository/e-journal(s).

- Librarians have a stimulating and mediating role in the realization of e-access to journals and of the start up of a publishing platform. Technically they will have a key role in the up/downloading of documents.

6. It is difficult to give correct indications of the necessary costs. Mainly it will be infrastructural, operational and support cost.
   - For E-journal access:
     - Extra internet access
     - Interlibrary services for countries with limited internet access
     - Training the users: information managers and users researchers
   - For the repository
     - Hosting of a repository server (hardware and services)
     - Extra bandwidth
     - Extra internet access
     - Training and support for the host organization (African host)
     - Training and support for the repository administrators
     - Training and support for the Upload centres (for Information managers and researchers)

Diepenbeek, August 18 2003