Terms of Reference

Web Development Consultancy Services

Clearing-House Mechanism

Background

The Convention on Biological Diversity (CBD) is one of the key agreements adopted at the 1992 Earth Summit in Rio de Janeiro, where world leaders agreed on a comprehensive strategy for sustainable development – meeting our needs while ensuring that we leave a healthy and viable world for future generations. The Convention has 192 Parties and three main goals: the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of the benefits from the use of genetic resources.

The Secretariat of the Convention, administered by the United Nations Environment Programme (UNEP), is located in Montreal, Canada. It is a small but dynamic and multicultural office consisting of approximately 70 staff. Its main tasks are to arrange for and service meetings of the Conference of the Parties, including the preparation of pertinent documentation, the operation of the international node of the clearing house mechanism, and the liaising and coordination with other international bodies and processes for the effective implementation of the Convention.

The Clearing-House Mechanism (CHM) is the information exchange platform of the Convention on Biological Diversity. Created in accordance with Article 18(3), it has evolved into a global network of websites with the CBD website (www.cbd.int) as its central node. This website has been playing an increasing role in information exchange and outreach, and its CHM online services should be strengthened as requested by the Conference of Parties in the following items of decision IX/30, paragraph 6:

(a) Gradually build a knowledge base, to facilitate access to relevant references, such as guidelines, strategies, reports and other information;

(b) Provide collaboration tools to enable Parties to maintain contact, share ideas and brainstorm on how to implement the Convention; keeping in mind that such collaboration is most effective when appropriate incentives such as well-defined discussion topics and clear objectives are available to encourage participation;

(c) In consultation with the informal advisory committee (CHM-IAC), provide a detailed analysis about the scope and complexity of a potential on-line submission system for sharing knowledge and experiences, and, if feasible and appropriate, develop a prototype for review and comments by interested Parties;

(d) Establish, whenever applicable and feasible, common formats and vocabularies for the clearing-house mechanism information systems with a view to enhance clarity, user-friendliness, efficiency, interoperability, and data comparability;

(e) Strengthen the Secretariat's capacity in areas related to the clearing-house mechanism, such as information technology, website, knowledge management and other modern information services, focusing on the priority areas identified in this paragraph;

(f) Improve the Convention's website, its accessibility, and make this website available in all United Nations languages.

Additional information can be found on the CBD website at www.cbd.int.

Work to be Undertaken

Under the supervision of the Clearing-House Mechanism Programme Officer, the consultant will strengthen the CBD website by turning its information section (www.cbd.int/information) into a modern, attractive, user-friendly, feature-rich, multilingual, reliable and secure web portal providing up-to-date information, knowledge and services to CBD Parties and all interested stakeholders.

The web portal will be designed to offer the following features and services:

- A knowledge base gathering key resources (tools, guidelines, best practices, case studies) as well as interconnected fact sheets about relevant information, initiatives, organizations, and contacts, with cross-references to other programmes whenever applicable.
- A powerful and smart search engine to present results in a user-friendly and structured way.
- An on-line submission system allowing users to upload information and contribute to the knowledge base.
- Support for multimedia information such as photos, videos and geo-location features.
- A data exchange mechanism based on Web 2.0 open standards and technologies.
- Appropriate data migration or synchronization tools to handle existing information and ensure service continuity.

The specifications of the CHM knowledge base are annexed. Candidates may wish to contact the CBD Secretariat for further details. They are encouraged to make use of their expertise and creativity to provide constructive comments on the specifications with a view to successfully implementing them in the context of this consultancy.

Organization of Work

The consultant will work remotely through a secure high-speed reliable Internet connection (SSH/RDC). In addition to e-mail and phone, they should be reachable through modern Internet communication tools such as Skype or GoogleTalk. The consultant will need to setup a local web development environment consisting of IIS, SQL Server, Visual Studio, and SVN. The CBD Secretariat will provide guidance to facilitate the establishment of such an environment.

Deliverables

The deliverables consist of the following products and services.

1. A technical design proposal describing the system architecture and the various components.
2. The knowledge base infrastructure (back-end database, user interface, business logic).
3. The knowledge base search engine.
4. The knowledge base forms and fact sheets for the main types of information.
5. The data migration/synchronization tools.
6. The data exchange mechanism.
7. All related source files and documentation.
8. Two months of maintenance and support.

Timeframe

A total timeframe of up to eight months is envisaged for the delivery of products and services specified above from January to August 2010, with a shift towards maintenance and support during the last two months (July-August 2010). The consultant may work on a part-time basis provided that all products and services are delivered in time.

Modalities of Payment and Delivery Schedule

Total fees of USD 22,000 will be paid based on the delivery of work completed. The following schedule is indicative and may be varied according to actual delivery:

1. USD 2,000 at contract signature.
2. USD 4,000 in the end of February 2010 upon successful delivery of the technical design, and implementation of the core infrastructure.
3. USD 6,000 in the end of April 2010 upon successful implementation of the search engine and main user interface components.
4. USD 6,000 at the end of June 2010 upon successful implementation of the whole system including data migration/synchronization tools and data exchange mechanism.
5. USD 4,000 at the end of August 2010 upon successful maintenance and final delivery of all products, services, source files and documentation.

Qualifications

Education

Advanced university degree in information and communication technology (ICT), preferably with a specialization in the development of web-based applications and online systems, or a first degree with relevant combination of academic and professional qualifications.

Work Experience

Minimum six years of professional experience in designing, implementing and maintaining web applications, on-line databases, search engines and web 2.0 technologies. At least three years of web development and programming in C# and ASP.NET.

Technical Skills and Expertise

- Expert knowledge of web-related languages and protocols especially HTML, XHTML, CSS, Javascript, XML and HTTP.
- Expert knowledge of C# programming, ASP.NET 3.5, the Visual Studio development environment, as well as the SubVersion (SVN) source control environment.
- Proven practical experience with Web 2.0 technologies, including jQuery, JSON, AJAX, REST and SOAP.
- Excellent knowledge of relational databases, in particular SQL Server database.
- Knowledge of website security threats, and ability to develop secure information systems.
- Knowledge of website design techniques, including graphical design, web standards and usability guidelines.
- Knowledge of multimedia technologies and mapping techniques is an asset.
- Other skills in information and communications technologies are an asset.

Core Competencies

- **Professionalism:** Strong expertise in the development of web-based applications and on-line services with good analytical skills and ability to solve problems.
- **User Orientation:** ability to understand user needs in order to provide user-friendly and ergonomic solutions that effectively meet user requirements.
- **Planning and Organizing:** Ability to plan projects and organize activities, work to tight deadlines, handle concurrent requests, and manage conflicting priorities.
- **Commitment to Continuous Learning:** willingness to keep abreast of new developments in the field of information and communication technology.
- **Communication:** Good spoken and written communication skills, including the ability to explain technical information and prepare written documentation in a clear, concise style.
- **Teamwork:** Good interpersonal skills and ability to establish and maintain effective working relations in a multicultural, multi-ethnic environment with sensitivity and respect for diversity.

Languages

Fluency in English; fluency in French or another United Nations official language is an asset.

Application

Submissions should contain an expression of interest, together with the curriculum vitae of the expert, stating his/her relevant experience and capacity to undertake the work.

All submissions should be made electronically to secretariat@cbd.int before 10 December 2009

Annex

Specifications of the CHM Knowledge Base

Introduction

This annex provides functional and technical details regarding the knowledge base (KB) envisaged for the CBD Clearing-House Mechanism (CHM). It contains the following sections:

- Design Goals.
- Information Analysis
- Current Situation
- Proposed User Interface and Search Engine
- Proposed Database

The information provided in this annex is indicative and may be adjusted to improve implementation and/or better respond to users' needs.

Design Goals

The following design goals have been identified for the online CHM knowledge base:

- To serve the needs of the Parties, the CBD Secretariat as well as other stakeholders of the convention by sharing information and facilitating networking.
- To provide key information and knowledge about the convention and its implementation, mostly in the form of interconnected factsheets on relevant resources (guidelines, best practices, case studies), initiatives/projects, organizations and contacts (who's who & yellow pages), with cross-references between programmes and countries.
- To be available as an on-line service.
- To feature a powerful smart search engine able to present results in a user-friendly and structured way.
- To be multilingual with an initial focus on English, French and Spanish.
- To be multi-relational in the sense that any information item could be related to any other item if needed.
- To support modern popular information formats such as pictures, videos and maps.
- To be centrally maintained by the CBD Secretariat with the possibility of accepting external contributions through integration with an on-line submission system. User account creation and profile maintenance should be carefully designed to be as streamlined and intuitive as possible.
- To build upon existing CBD data including country profiles, documents, contacts, calendars and other key existing information.

Information Analysis

Information Types

The following major information types have been identified:

1. Core CBD Information (articles, decisions/recommendations, strategic plans, work programmes)
2. Reference Documents (strategies, reports, guidelines, best practices, ...)
3. Information sources (libraries, on-line services, databases, ...)
4. Initiatives (projects, case studies, success stories, ...)
5. Yellow pages for organizations (CBD partners and stakeholders)
6. Who's who for people (national focal points, official contacts, staff, experts, authors, ...)
7. Events (CBD meetings, biodiversity-related events, ...)

Information Formats

The above information can be available in various formats:

1. Document (electronic or print), including presentations and spreadsheets
2. Website
3. Web page
4. Pictures
5. Videos
6. Audio recording
7. CD/DVD

Linking Related Information

Linking related information is almost as important as the information itself. Although the CBD website offers a wide range of information, dots are not always systematically connected. Whenever applicable, each information item could potentially be linked to:

- Relevant programme(s) (thematic area / subject)
- Country(ies)
- A corresponding meeting
- Corresponding organization(s)
- People involved
- Any related information (documents, links, etc)

Information Update Workflow

The following information update workflow is envisaged with partners (organizations or Parties):

- Drafted internally within the organization.
- Submitted by organization's official contact.
- Approved by SCBD.
- Rejected by SCBD (for further review by submitter).

Current Situation

Current Database

A wide range of information is currently available on the CBD website. The main CBD database consists of more than 200 tables whose data can be roughly summarized as follows:

- Document Table
    - Meeting documents
    - National reports
    - Case studies (about 20 variants)
    - Various other items
- Country Table
- Organization & Links Tables
- Several Contact Tables
    - Web User Profiles
    - National Focal Points
    - Meeting Participants
    - Mail Log Contacts

- Texts & Categories Table
- CMS, Web Pages & System Tables
- Photo Gallery
- Other Miscellaneous Data Tables

Current Limitations

Most CBD information services have a corresponding search form (e.g. meetings, notifications, specific case studies, etc). However, feedback has revealed that users do have problems finding information because it is scattered across the website and there is no global integration.

In addition, the global website search (based on Google) has two limitations:

- It does not include the CBD database content.
- It presents its results as an unstructured raw list upon which we have no control.

A smarter and more sophisticated search mechanism is therefore needed.

User feedback has also revealed an information gap in terms of information available on implementation, as well as the need to link that information to countries, to CBD programmes (by strategic goal), and to some biodiversity information (biomes, eco-regions, species).

Furthermore, the recent popularity of Web 2.0 on-line services on the Internet has increased expectations. Multimedia (photos, videos) and geo-location (maps) are becoming standard features of any professional on-line system.

Proposed User Interface and Search Engine

User Interface

The visual presentation will consist of factsheets presented in a Wikipedia-style format. The format of each factsheet will depend on each type of information, but the following common elements should always be present:

- Title
- Brief summary/abstract
- Table of content
- Overview
- [Specific sections]
- Related information

Notes:

- It is recommended to visually illustrate each factsheet with a small picture located at the top, similarly to how most newspapers introduce their articles. The selection of the picture is obvious in many cases:
    - The cover page for a document
    - A photo for a CBD programme representing an ecosystem
    - The logo for an organization
    - The ID picture for a person
    - A home page icon for an on-line information service (e.g. similar to icons displayed by the Google Chrome browser)
    - The flag for a country
    - Some generic icons should be designed to represent frequent types of information (Decisions)

- The related information section is very important and should be visually promoted possibly in the form of a "See also" box in the top-right part of the page.
- When a lot of detailed information is available, a 2-tab presentation (Overview and Details) is recommended for not directly overloading the reader when s/he reaches the factsheet.
- Videos can be supported by systematically uploading them to YouTube and using the generated link in the page.
- Maps can also be supported by storing geo-location information and using a generic Google map script.

Search Engine

The search engine should be designed to combine Internet search results with database results. This is technically feasible thanks to the search providers' application programming interface (API) which enables programmatic search. The idea is to handle each search request as follows:

- The search query is captured and analyzed by the system
- The system sends two simultaneous search requests:
    - An internal search on the CBD database.
    - An Internet search.
- The two search result sets are compared, and any duplicate is removed from the Internet search results
- The CBD search results are analyzed and sorted by categories to be presented in a structured way.
- The remaining results are displayed under the category "Additional Internet Results..."

The advantage of such an approach is that the KB results are promoted in a way that can be controlled. Should an additional Internet result be very relevant, it can be added to the KB as a new item linked to all relevant items/categories (e.g. programmes, country, etc).

The search engine should also have the following features:

- A simple/advanced search approach is recommended. The simple approach would be a single text box, while the advanced search would include country, subjects and information type.
- Whenever feasible, the search form should only display drop-down item values for which there is at least one match. (E.g. a country should not be in the dropdown if there is no information on it).
- There should be a way to initialize and/or launch the search by URL (e.g.? subject=IAS&go=1).
- There should be a way to hide/show some search fields in the web control configuration.
- The search engine should be compatible with the OpenSearch specification (www.opensearch.org) so that other partners could benefit from our KB.

The results should be presented in a simple list with paging:

- Clickable Title.
- Summary.
- Source.
- Updated.

Figure 1 shows a simplified representation of what the user search screen would look like. Figure 2 shows a potential results screen that would result from such a search.

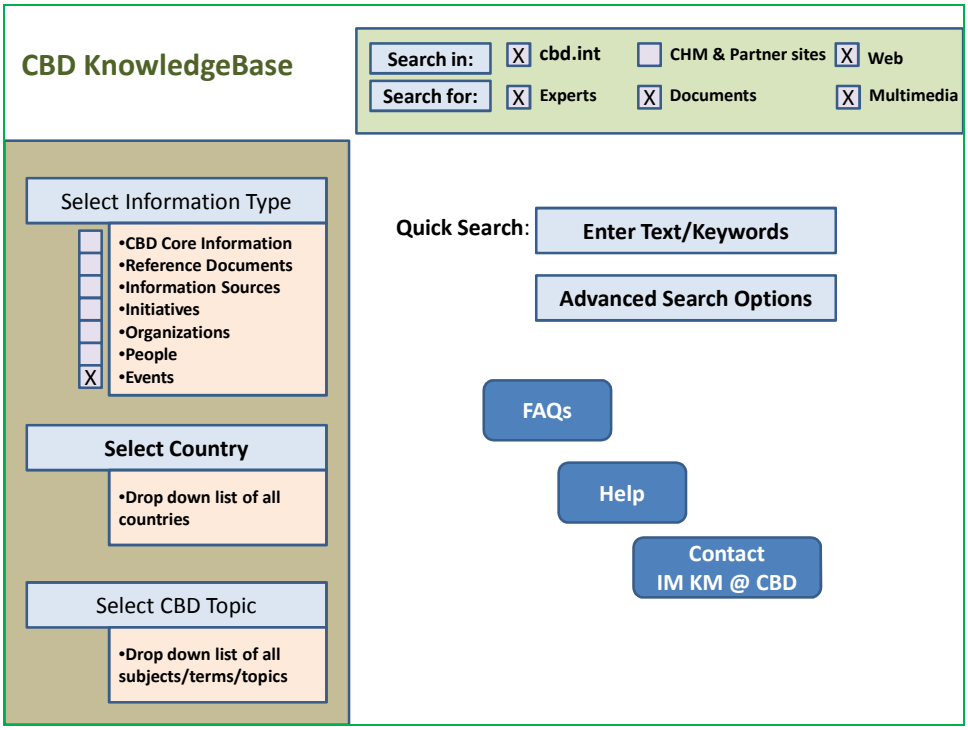

Figure 1. Overview of KB Search Page

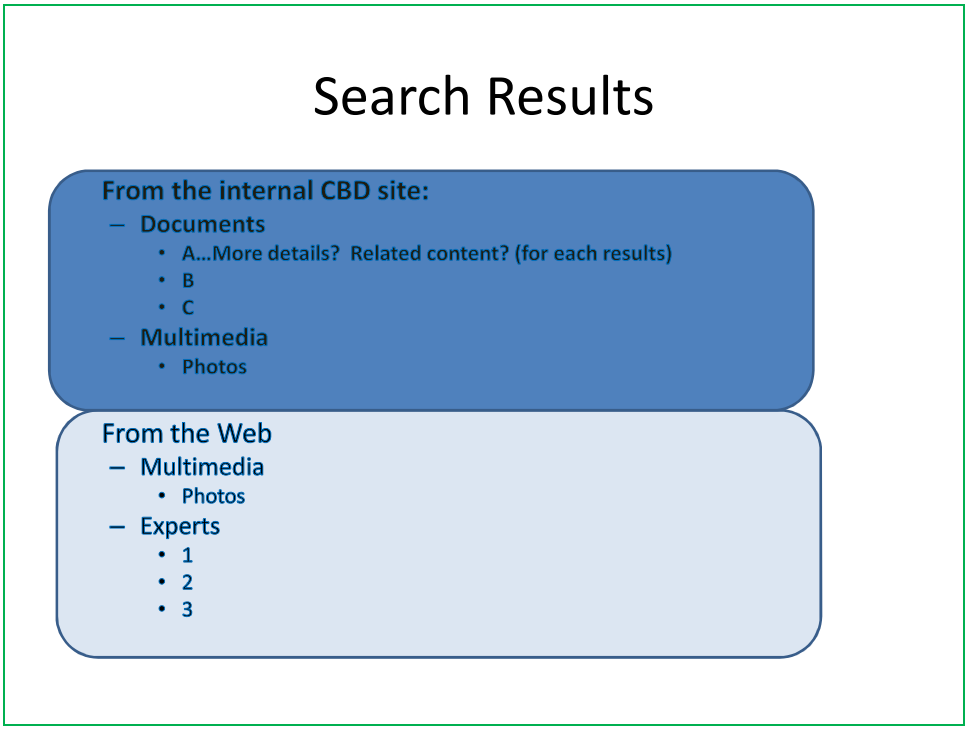

Figure 2. Overview of KB Search Results

Proposed Database

The database structure should be designed with the following points in mind:

- To build upon existing CBD data, while allowing the KB administrator to selectively include existing information
- To support both CBD data and on-line resources
- To enable an efficient global search with structured results
- To be multilingual
- To be multi-relational

The following overall generic approach is proposed based on 4 core tables:

- KbItems - List of all items of the KB
    - Only list the item (without storing any data or metadata)
    - Can be anything: country, protected area, project, document, decision, link, event, person, organization, etc
    - Reference to the location & physical implementation
    - Compatible with any existing data
- KbRelations - All relations between KB Items
    - For multi-relational support (Parent-Child relation between any items of any types)
    - Many examples (reports linked to a country, case study submitted by an expert, activity to achieve a goal, document on a topic)
- KbTexts - All KB texts in all supported languages
    - For multi-lingual support
    - Several text entries could be available for each KbItem
    - A language column to indicate the language of the text entry
    - A single text column for efficient text search
    - A text type column to make a distinction between various types of text (name, title, description, etc)
- KbTypes - All KB information types
    - Simple list of all types
    - Will enable the comprehensive structured search