Oxymoron, a transdisciplinary tool and workshop for sharing literature reviews among researchers

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Abstract
Oxymoron is a World Wide Web based knowledge capitalization and sharing tool, which was conceived and developed by a multidisciplinary team, comprised of adult education and distributed systems professionals from France and Switzerland. It aims to support and facilitate inter-peer work of students and researchers in the social sciences by providing them with a system where they can contribute and receive knowledge about the relevant readings in their fields of interest. Oxymoron is an extranet tool, the access to which is granted to various adult education institutions, in order to constitute an transdisciplinary knowledge repository as well as to facilitate distance learning and tutored pedagogy.

Keywords
Knowledge Management, Social sciences, Transdisciplinarity, Cooperative learning, WWW, Reading cards.

Objectives
The principal ideas behind Oxymoron are directed towards individual persons, as well as towards the community.
For individual persons:
- Facilitate identification and contact with other researchers on specific themes
- Facilitate finding of relevant literature and reduce wandering and exploration time
- Provide transdisciplinary information on specific themes
- Save and share personal readings
- Become familiar with publishing one's works and issuing constructive critical comments to others

For the community:
- Create a networked multidisciplinary community of researchers
- Create and share a transdisciplinary knowledge repository
- Share a collection of informal knowledge in the form of fine-grained annotations of the repository
- Promote non-distance learning and tutored pedagogy

Capitalization of knowledge is a serious problem for education and research institutions that want to create an institutional memory, most notably because researchers and students leave with their personal notes at the end of their project. The trace of their thinking trails and construction processes are not retained by the institutions, whose missions, by definition, go beyond those of their students. Oxymoron represents the possibility to save and accumulate the results of the works of successive classes of students and researchers and thereby create a “humus” made out of the accumulation and union of all this material.

The sharing of research works fits into the framework of the ongoing mutation of the knowledge economy: The creation of collective intelligence is one of its foundations and cooperative work is one of the most promising avenues for tomorrow’s pedagogy [4, 7]. Oxymoron offers, for adult students engaged in an education process leading to the creation of a thesis, the possibility of communicating to their peers the results of their exploration of the literature. In compensation for which, they obtain access to the works of all the other users of the tool. Furthermore, Oxymoron encourages the publication and sharing of thought processes, in construction, by way of fine-

grained annotation [6]. Annotations, by their potentially informal nature may capture what Conklin calls informal knowledge [1].

Oxymoron is not a documentation center or a collection of validated works. It is a tool for sharing knowledge and research processes. In short, Oxymoron aims to preserve the paths rather than the goals. Oxymoron is not a library but a workshop where different tools are displayed, as well as various sketches at different stages of work. This workshop is precisely the place where actors and authors are expected and encouraged to meet.

A methodology of research

Oxymoron complies with and enhances a precise methodology of research defined by Quivy and Campenhoudt [8] that is broadly spread throughout the French speaking social sciences. Its structure unfolds like the different and successive stages of building a research: formulation of the research problem (keywords), analysis of state of the art (references), hypothesis formulation (concept definitions), field study (various inquiry techniques) and final theoretical interpretation (quotations). Throughout all these stages researchers create and consult reading cards. Reading card was translated from the French expression “fiche de lecture”. Reading cards are used extensively to keep a trace of one’s readings.

The formulation of a research problem enables the definition of a number of key words, which, in turn, function as markers allowing the identification of other researchers interested in the same topic and the finding of relevant titles and quotations in the knowledge repository.

Once they find the bibliographical entry they are looking for, students may want to get a quick overview of its contents, and thus will refer to other users' previously added value. A reading card is not meant to replace the necessity of reading authors *in texto* but to help students to find the right people and the relevant ideas in relation to a number of specific themes. Users in search of documentation will be able to narrow down the set of books they need to read and understand, by walking through the reading notes made by other users. Moreover, there is a probability that these previous readers come from different disciplinary fields and thus the accumulated annotations may well be a transdisciplinary repository around precise items.

Once the field study has been conducted and the collected material is classified, reading cards are again helpful in the construction of the theoretical interpretation, through the links with various authors that Oxymoron will make visible around a single keyword or idea.

Structure

The Oxymoron repository is organized in 3 main areas:

- users directory
- shared area or knowledge repository
- personal area (diary + bookmarks + tutoring space)

All areas including annotations are accessible in browse and search modes. The system also provides a chat room for synchronous communication, a tutoring space and an internal messaging service.

The users directory displays personal information in order to facilitate inter-personal contact, as well as past and present research topics and keywords designed to link users with a research community.

The knowledge repository is composed of a collection of annotated reading cards and a glossary. A reading card is divided into 2 main parts:

- An objective description of the book or article (author, title, table of content, abstract, keywords) that enables users to find keyword-centered reference lists using the search engine.
- Personal and subjective views that we call added value, of the reading (reading notes and quotes, and/or summary, and/or assessment, and/or written, audio, or video critical comments,

and/or interesting links). These enable a quick understanding of the contents of the publication, give samples of author's thought and style, and contextualize the publication within the community's interests and values.

Every added item is dated and signed, thus remains property of its author who is the only one allowed to modify or delete it. Readers' comments or complementary adjunctions are entered through the use of an annotation tool. Dated and signed annotations are accumulated so as to constitute a trail of thinking processes and a knowledge repository around specific themes.

The glossary displays a collection of sourced definitions enabling not only the definition of concepts as in a dictionary, but the witnessing of the evolution of concepts and the variety of multidisciplinary understandings.

The personal area is composed of 4 sections:

- The diary, which is aimed at collecting personal informal notes, so as to enable the connection with formalized thoughts of the shared area through the search tool.
- Oxymoron internal bookmarks
- The tutoring space, where users can send and receive corrected copies of their works
- An list of main users' actions in Oxymoron

Usage Patterns

We are aware of a number of conditions to be filled for new technologies to be accepted by users:

- people must be aware of the benefits they will get out of the effort
- personal help must be easy to find
- use must be free of financial or academical sanctions

Access to Oxymoron is thus granted to institutions only through two conditions: a low yearly registration fee - the amount of which is yet to be determined - and the nomination of at least one institutional tutor. **Institutional tutoring** seems to be the indispensable condition to insure quality, as well as quantity, of content in the repository. An institution warrants not only a certain level of thought but also the amount of cards in a certain disciplinary field, which is the main source of interest for users. The kinds of institutes that are likely to benefit from Oxymoron are adult education, higher education, and research institutes

On the users' side, Oxymoron functions under the principle of **gift/counter-gift**: one may get to the repository on condition that one has previously enlarged it. The student's benefit should be obvious: for 3 reading cards given in your field, you get access to at least 3 * n reading cards in different fields, where n is the number of Oxymoron users. Every researcher knows what amount of saved time this represents, apart from comprehensive transdisciplinary possibilities.

Tutors

Within an adult education institution, the Oxymoron tutor is in charge of introducing the students to the rules and benefits of Oxymoron and instructing them. He or she will also have to encourage participation and assist with the first procedures, and cope with the subsequent up surging resistances and discouragements facing new technology. The tutor personally verifies the format of every student's first entries and delivers passwords as soon as the required amount of entries is completed. He or she may be joined without distance in case of a methodological or a technical problem. Once (or more, experience will show) a year, he or she will have to check the knowledge repository created by "his/her" students and do some "cleaning up" under supervision of a number of disciplinary experts.

User Interface

Oxymoron was optimized, following user input, for use by adult distance learners who work primarily from their home outside of normal working hours. It enables users to contribute to the knowledge repository by using a word processor as well as HTML forms. This makes it possible to support off-line work thus cutting down on costly Internet connections.

Architecture

Oxymoron is a distributed system which main core is built around the Linux operating system, Apache Web server and MySQL relational database. This core Oxymoron server is loosely linked with a Windows NT server running Microsoft's Internet Information Server (IIS) through an ftp and an http connection. This connection allows Oxymoron users to upload Word processor documents containing collections of reading cards, table of contents, and the like. These documents are sent by Oxymoron to the NT server for processing. The processing depends on the nature of the document. Documents containing reading cards are opened, the reading cards are extracted and sent to the main Oxymoron server through http requests in order to be inserted into the database. Table of contents are converted into HTML documents. These HTML documents are sent to the Oxymoron server to be added to the database.

Since Oxymoron is mainly built on top of Open Source technologies, it is possible to create many Oxymoron servers. Each such server can support one or several institutions. In order to create the conditions for transdisciplinarity, these instances of Oxymoron need to be federated and accessible to all Oxymoron users. This challenge lies ahead of us.

Conclusions

Oxymoron's currently projected users are multidisciplinary post-graduate students at IKB (Palliative Care & Thanatology, Mediation, Quality Management), at UCSDR (Social Sciences) and computer science researchers at EPFL-ICA. We now intend to proceed with an evaluation of its usage patterns and the barriers to its more frequent use and intend to use contextual inquiry techniques [5] to understand how users use Oxymoron in their homes.

We intend to pursue the development of Oxymoron in the following directions:
To help Oxymoron users find their way within a multi-disciplinary knowledge repository, we are considering automatically cross referencing all keywords to their, potentially, multiple definitions and references. We are looking into offering information fetching services through the use of intelligent agents that will collect information on the Web on behalf of Oxymoron users in users' specified interest areas.
Over time we will face the problem of visualizing massive amounts of quotes, reading cards, keywords etc. We are exploring the feasibility of offering a concept map visualization tool that will help users to navigate within the knowledge repository.

The Oxymoron main page is available, on the Web, at http://sgwww.epfl.ch/UF/Oxymoron

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