
CITATION LINKING OF JOURNAL ARTICLES IN KNOWLEDGE PORTALS WITH REFERENCE TO ACM E-JOURNAL PORTAL

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Abstract

The most innovative online journals are maturing rapidly and distinctive new Knowledge Portals are emerging day by day. Foremost among the features of the portals is the hypertext link, popularized by the World Wide Web and which will form the basis of a new, highly integrated scholarly literature. Journal integration in this instance seeks to recognize, extend and exploit relationships at the level of journal content—the papers—while maintaining some of the familiar contexts. Links are a powerful tool for journal integration, most immediately in the form of citation linking. The paper defines what knowledge portals are and describes a new system, a link service, which is being developed to support novel and flexible linking mechanisms on the Web. The main aims and objectives of the study and the definitions of citation linking of journal articles and the importance of the citation linking are also discussed in this article with reference to the e-journal Knowledge portal of ACM. The methodology used in the JACM to link the citations is explained with figures.

1. Introduction

The most innovative online journals are maturing rapidly and distinctive new knowledge portals are emerging day by day with the feature of hypertext link, popularized by the World Wide Web and which will form the basis of a new, highly integrated scholarly literature. Journal integration in this instance seeks to recognize, extend and exploit relationships at the level of journal content—the papers—while maintaining some of the familiar contexts. Links are a powerful tool for journal integration, most immediately in the form of citation linking. The paper defines what are knowledge portals, and describes a new system, a link service, which is being developed to support novel and flexible linking mechanisms on the Web with special reference to ACM e-journal Portal.

2. Aims and Objectives of the Study

The aim of the study is to develop awareness of the information retrieval technologies based on Distributed Link Service provided in the knowledge portals and Also to help the users to know about the linked citation, which will direct them to access an intermediate page offering the user a choice either to download the text from the archive or look up some contextual information on the citation.

The ultimate goal of the study is to realize the vision of making the best use of interrelated information through a Link service in the knowledge portals.

The objectives of the study are:

- To develop awareness about the citation linking facilities available in the ACM Portal of Electronic Journals.
- To find out the impact and usage patterns of the citations, in the Journal of the ACM.
- To find out the useful downloading facilities provided in the articles and references.

3. Knowledge Portals

The term “portal” is used quite ambiguously, especially because it evolved over time and became commonplace. Portals started as applications, typically Web-based, providing a single point of access to distribute on-line information, such as documents resulting from a search, news channels, and links to specialized Web sites. To facilitate access to large accumulations of information, portals quickly evolved to include advanced search capabilities and organizing schemes. Because of their emphasis on information, these first-generation portals are often called information portals [1].

“Knowledge portals are single-point-access software systems intended to provide easy and timely access to information and to support communities of knowledge workers who share common goals”[1].

“According to leading technology analyst firm The Delphi Group, there are several key features required for a successful portal platform: integration, categorization, search, publication and distribution, process, collaboration, personalization and presentation. InfoImage delivers these functions through five technology differentiators. Based on their criteria, The Delphi Group has deemed InfoImage Portal 5.0 “a true platform.”[2]

SOURCE: <http://www.infoimage.com/products/>

Knowledge Portals represent a solution to the cultural and technological challenges, as they provide a flexible knowledge environment to a potentially large number of users. The mission of a Knowledge Portal is not only to provide a library-like pool of information, but to actively support the user in his or her business processes.[3]

4. Citation or Reference Linking in Knowledge Portals

In published journal articles, there are always some papers or books that are cited as references for the concepts or ideas presented in them. These cited references are used to refer the reader to the relevant papers for further reading on the concepts and ideas that are introduced in the source paper. They reveal how the source paper is linked to the prior relevant research on the assumption that citing and cited references have a strong link through semantics. They provide a valuable source of information and directives for researchers in the exchange of ideas, the current trends and Corresponding author. Such linkage is called citation linking [4].

Reference linking is one of the building blocks that are being used to build large-scale automated digital libraries. Research Index is a digital library of computer science materials, created entirely automatically by Steve Lawrence and colleagues at NEC [5]. It makes extensive use of citation analysis and reference linking. It downloads papers from the web. If they are in PostScript or PDF, it converts them to text. It parses the papers to extract citations and the context for the citation. It provides users with services such as searching the entire text or the citations, listing the references within a paper, following the citation links, or displaying the context in which references appears.

5. What is Citation Linking ?

“A link is the specification of a relationship between a data source and destination where both the source and destination may expand to one of several places in a particular set of documents. These flexible relationships are usually coded explicitly by the DLS as a generic link but they may be the by-product of a more complicated processing arrangement”.

Citation linking combines the two approaches, mapping both reference data and citation index data on to the text in the form of links. Adding electronic links to the literature is introducing a new culture in many respects, but citation linking is likely to be acceptable to the academic community because it builds on practices established in other forms such as print [6].

5. Importance of Citation Linking in the Knowledge Portal E-journal Articles :

- The most fundamental problem facing journal readers, library users and, it follows, librarians, is physically to get hold of all the journal articles they need when they need them. The reason most commonly cited is economic, that journal price inflation has outstripped library (and personal subscriber) budgets, with rationalization the inevitable result.

- There has also been growth in the number of portals and journal titles, which reflects changes within traditional academic disciplines: broadening and subsequent fragmentation within fields, and greater emphasis on cross-disciplinary work. These are complex academic, socio-economic and political issues. As the number of published papers grows and the demand to read articles increases, our ability to access the literature is deteriorating.
- The journal prices affect most users more directly than do journal prices. The critical new factor is the Web, a massively popular platform that offers the chance to prevent further deterioration.
- The introduction of Web-based library catalogues begin to speed up access to individual journal articles where electronic versions are available, but there are still many problems. There is evidence that users are ready to accept dramatic changes in practice. A major stimulus for improved access to electronic articles is increased electronic collaboration between researchers,
- In the context of knowledge portals of academic e-journals, the idea of providing 'clickable' links from citations is simple and obvious and on a small scale the implementation can be technically straightforward.
- The Web has become a massively popular Internet service in just 2-3 years since the introduction of graphical browsers such as Mosaic and Netscape. The popularity of the knowledge portals emerging day to day on Web shows there is a real demand for links when they are simple to create and to use [7].

6. ACM Portal/Digital Library

ACM Digital Library Website (<http://portal.acm.org>) has been chosen as reference for the study of Citation linking of Journal articles. From the ACM Digital Library Journals, Journal of the ACM has been taken as sample to the study [8].

6.1 Journal of the ACM (JACM)

URL: <http://portal.acm.org/portal.cfm>

ISSN : 0004-5411

PUBLISHER : ASSOCIATION FOR COMPUTING MACHINERY (ACM)

ACM PRESS, NEW YORK, USA

DOI BOOK MARK : <http://doi.acm.org/10.1145/1008731.1008732>

The *Journal of the ACM (JACM)* serves as a venue for careful presentation of theoretical research in the core areas of computing: complexity of algorithms, computer architecture, system modeling,

AI, data structures, database theory and graph theory, to name a few. The authors are world class scientists, writing to other scientists about advances, methods and findings behind the fundamentals [8].

The ACM Digital Library is available on-line on Internet and among the ACM Journals, ACM Magazine and ACM Transactions etc., the “JOURNAL OF THE ACM (JACM)”, under the option of Journals, which is published Bi-monthly has been taken as sample of e-journal for the study.

7. Analysis of the ACM Portal Journal Articles and Its References/Citations

The JACM e-journal is available on-line on Internet

- The JACM is a Scholarly e-journal which is very much useful for the Research Scholars, especially for the Engineering Science Scholars.
- The information regarding the journal articles and its references can be downloaded on free-of-cost.
- Abstracts of the source articles with bibliographical details also can be retrieved freely.
- It is easy to link the data using a Distributed Link Service.
- Anybody can browse the website and access the required data of the articles with abstract and references at any time on free of cost
- This database, although not linking to the full-text articles, provides a complete set of metadata for the cited article including an abstract and the citations given in that cited document.
- From the citation and references of the articles distributed links have been provided to other citations and also to various useful websites.
- If we click a linked citation, we can retrieve the required information without any disturbance and break, from link to link on a single mouse click.

7.1 Methodology Used in the Portal of ACM Digital Library

ACM Digital Library is an e-bridge platform available online at the website [Http://www.acm.portal.com](http://www.acm.portal.com), designed and implemented by the Association for Computing Machinery. A half century of pioneering concepts and fundamental research have been digitized and indexed in a variety of ways in this special collection of works published by the ACM since its inception. The ACM Digital Library includes Bibliographic information, abstracts, reviews and full texts from journals, magazines and conference proceedings and the papers are available in the PDF format.

7.2 Title and Author Section

The Title and the Author section of a journal article is very important citation linking. A PDF string of the title must satisfy the following two conditions:

- i) on the first page it needs to have largest font size
- ii) If there is more than one string, only the first string only to be taken as the title.

The above method works well for most of the PDF files and emitting this string as an HTML element is sufficient for the extraction of data from references for linking. In the ACM portal the above method is followed for providing effective link services.

Next to the Title Section the Author section is much important and finding the author section is depending on finding the title. In the ACM portal, the author section is emitted as <center> HTML elements as one per line. The reference linking data extraction software is thus developed, disambiguating the contents of the author section. As part of determining where the author section ends, an attempt is made to determine the format of section titles. This is important in order to determine where the reference section starts. The reference section (1) begins with a section title, and (2) has a title such as \References", \Bibliography", etc. [9]

7.3 Contexts and References

Although many reference linking applications with the reference section of a paper, it is quite useful to be able to collect reference contexts as well. Contexts are sentences that contain one or more references.

For example, a sentence like \Other authors have presented alternative proofs of nonergodicity (Caplan and Arms [10], Hitchcock et al.[11].” is a context that contains two references (also called reference anchors). Useful information associated with each reference includes the following:

- _ Data regarding what work this reference represents (title, authors, year of publication, etc.)
- _ Locations of online copies of this work
- _ Contexts in which this reference appeared

8. Advantages of the Citation Linking Services Provided in the ACM Portal

- Citation analysis and linking assumes that the references to a particular JACM e-journal article reflect a scholarly impact of that article on the author of the citing work. It further

assumes that the accumulated total of citations to a given author's works in some sense reflects the impact of that author on scholarship and research.

- The same assumption applies to the assessment of the impact of e-journals—that the accumulated total of citations to all articles published by JACM is an indicator of the impact of that journal on the relevant discipline(s). Many studies have used citation-based measures as evaluation instruments for journals, research performance, university departments, universities, and published works.
- The facilities of the distributed link services, which allow authors to create links between arbitrary Web documents and then to publish those links for the benefit of other users, provide a basis for reintegrating the online literature.
- One of the major features of the link service is that, instead of inserting link data within the html (or other) coding of a source document, the data are held separately in a link database, or link base. The links can be viewed superimposed on a Web page, as though a transparency were overlaid on it, by retrieving the document from a URL via a proxy link server.
- The citation linking of the JACM e-journal articles demonstrates a tool, the Distributed Link Service, which has the potential to add new value to online journals through the use of flexible and cost-effective link 'publishing' strategies that are consistent with the new dynamic of the Web. The electronic medium enriches the research literature arena for all players of researchers, librarians, and publishers in numerous ways. Information has been made easier to discover, to share, and to sell.
- Citation linking is also a huge benefit to journal publishers, because, as with electronic bookselling, it drives readers to their content in yet another way. In step with what was largely a subscription-based economy for journal sales, an "article economy" appears to be emerging.
- Journal publishers sell an increasing amount of their content on an article basis, whether through document delivery services, aggregators, or their own pay-per-view systems. At the same time, most research-oriented access to digitized material is still mediated by libraries.

9. Conclusion

With the new arrivals of knowledge portals of academic e-journals, the most progressive of the journals are evidently heading towards a new phase in which they are being enhanced to take advantage of the capabilities of the Web. Tools to support this new functionality are proliferating. Among them, link services offer the potential to transform the use of the dominating feature of the

Web, the hypertext link. The linking services provided in the Knowledge Portals benefit many other digital library services and a new phase of convergence in digital library services is beginning and is being driven by those embracing pragmatic, widely shared interests throughout the scholarly community.

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