

## BRIEF COMMUNICATIONS

### Maintaining quality document delivery service with off-site storage facilities

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#### INTRODUCTION

With today's rapidly advancing technology and ever-increasing demand for information, many libraries are experiencing the need for more space. Whether the relocation of collections is temporary, to house materials during a library renovation or building project, or a permanent solution to accommodate long-term growth, key questions must be addressed when planning library services for off-site collections.

- What materials should be stored?
- What level of service can be maintained?
- What are the costs?

An extensive renovation of the Health Sciences Library at the University of North Carolina at Chapel Hill (UNC-HSL) began in July 2002 and was completed in the fall of 2004. The library's mandate was to maintain full services for the duration of the project. To provide temporary space for offices and public service during this time, collections formerly housed on the upper floors of the library were moved to an off-site storage facility, while the lower levels of the library were renovated. The off-site storage facility used by UNC-HSL was twenty-five miles from the campus, was in a different county, and was managed by a separate organization.

#### SELECTION PROCESS

The selection process for materials to be moved off-site is far from an exact science. However, "the use of circulation data is generally regarded at least as an initial element in determining what materials should be stored" [1]. Another school of thought targets preservation as a key factor in the decision process. "Deteriorated items, books or newspapers with inherently fragile paper, and materials susceptible to vandalism or theft can thus be relocated to remote facilities from which they can be recalled for controlled use" [2]. UNC-HSL considered space and frequency of use as the major factors for the decision, because most of the material would eventually be reinstated into the collection.

After considering the limited availability of space

and analyzing circulation records and reshelving statistics, UNC-HSL staff decided to transfer journals and monographs published before 1992, a total of 107,800 monographs and 182,200 journals, to an off-site storage facility. Based on circulation and reshelving records, staff estimated that 3,000 requests per year would be made for older material. It was determined that the interlibrary loan staff would be able to accommodate these requests in addition to their normal workload. In the first year of renovation, 13,423 pre-1992 publications, books, and articles—more than 4 times the estimated number—were requested from storage.

As Figure 1 illustrates, more than 50% of all requests were for materials published between 1980 and 1989. Fifteen percent came from 12 serial titles. The volume of storage requests would have been greatly reduced had there been enough space to retain the past 20 years' worth of material or 20-year runs of the specific serials shown in Figure 2. An alternative solution would have been to identify titles available in full-text electronic format and move their print equivalents off-site, making room in the library for older volumes not available online.

Deutch's 2001 article on paging at the Brooklyn College Library suggests a key point:

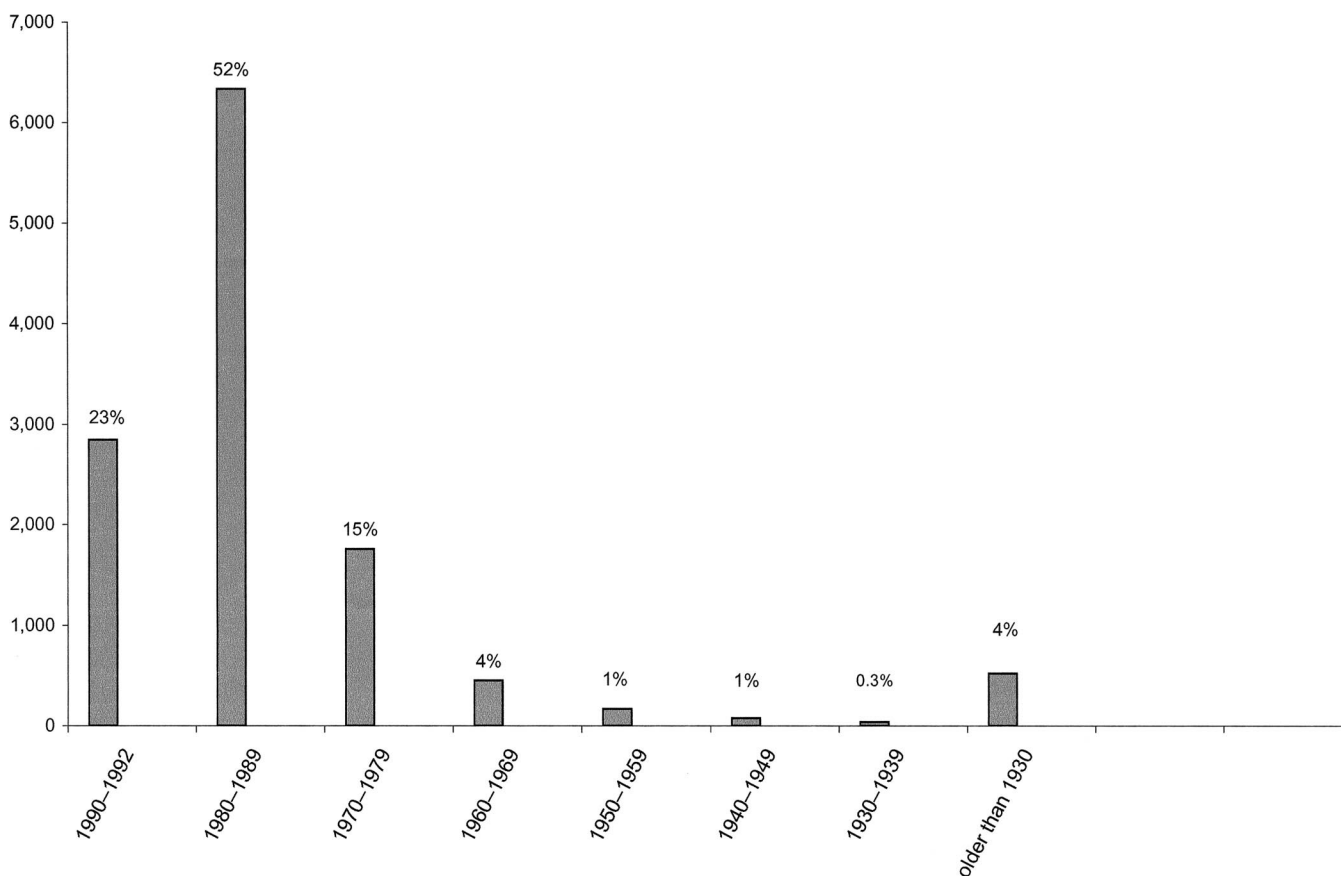
A reader typically will look at a number of books before deciding to charge out some subset of what he or she has examined. In the instance of closed stacks, this translates to mean that many more books will be requested by page than will be actually charged out. [3]

This was true at UNC-HSL, particularly in the case of article requests. Patrons were not charged for books or articles they requested from the off-site storage facility. This decision was made in part to compensate for inconveniences caused by the library renovation. Eventually patrons were limited to ten requests a day, but tracking the number of requests per patron became as time consuming as processing them. A small copy charge might have encouraged patrons to be more selective in their requests, or entire journal volumes should have been retrieved for high-volume requestors. Patrons could then have browsed the material and made their own copies, reducing the volume and cost of article retrieval.

#### REQUEST PROCESSING

Automating the request process and delivery routines expedited the retrieval process. Patrons submitted requests using online forms, created with ILLiad software. Staff then added item locations to the requests, using a locally developed database to indicate storage bin numbers for materials, and then emailed the requests to the storage facility. Storage center staff scanned articles into Ariel and delivered them electronically to the interlibrary loan department, where they were checked for quality and completeness before

**Figure 1**  
Number of requests for retrieval of items from storage



being sent directly to patrons' desktops. Electronic delivery was convenient for library staff, decreased processing time, and saved paper. For monographs and entire journal volumes, a private courier service made daily deliveries to UNC-HSL from the storage facility. Despite these labor-saving measures, temporary staff was added to help process the increased number of requests.

Borrowing requests (including storage requests) from UNC-HSL patrons increased from 2,916 articles and 330 books in 2001/02 to 17,153 articles and 1,327 books for 2002/03 during the renovation. A total of 13,423 storage requests were made, 12,826 of which were supplied by the off-site facility. Fifteen percent to 20% of storage requests were handled twice or more due to poor copy quality, cut margins, or misplaced volumes. The remainder was then ordered through standard interlibrary loan channels. Immense volume and tracking problems made it difficult to maintain quick, high-quality services.

#### LESSONS LEARNED

The levels of service provided to outside libraries and individual patrons are key factors in planning for off-site storage. UNC-HSL temporarily curtailed interli-

brary lending loans to focus staff resources on meeting the needs of affiliated users, including distance education students and students on rotation, and local library network partners. Interlibrary loan monograph requests were accepted only for materials housed on-site and items unique to the UNC-HSL collection. Storage items were loaned only to local library network partners. These measures reduced interlibrary lending activity by 9% of OCLC and DOCLINE requests.

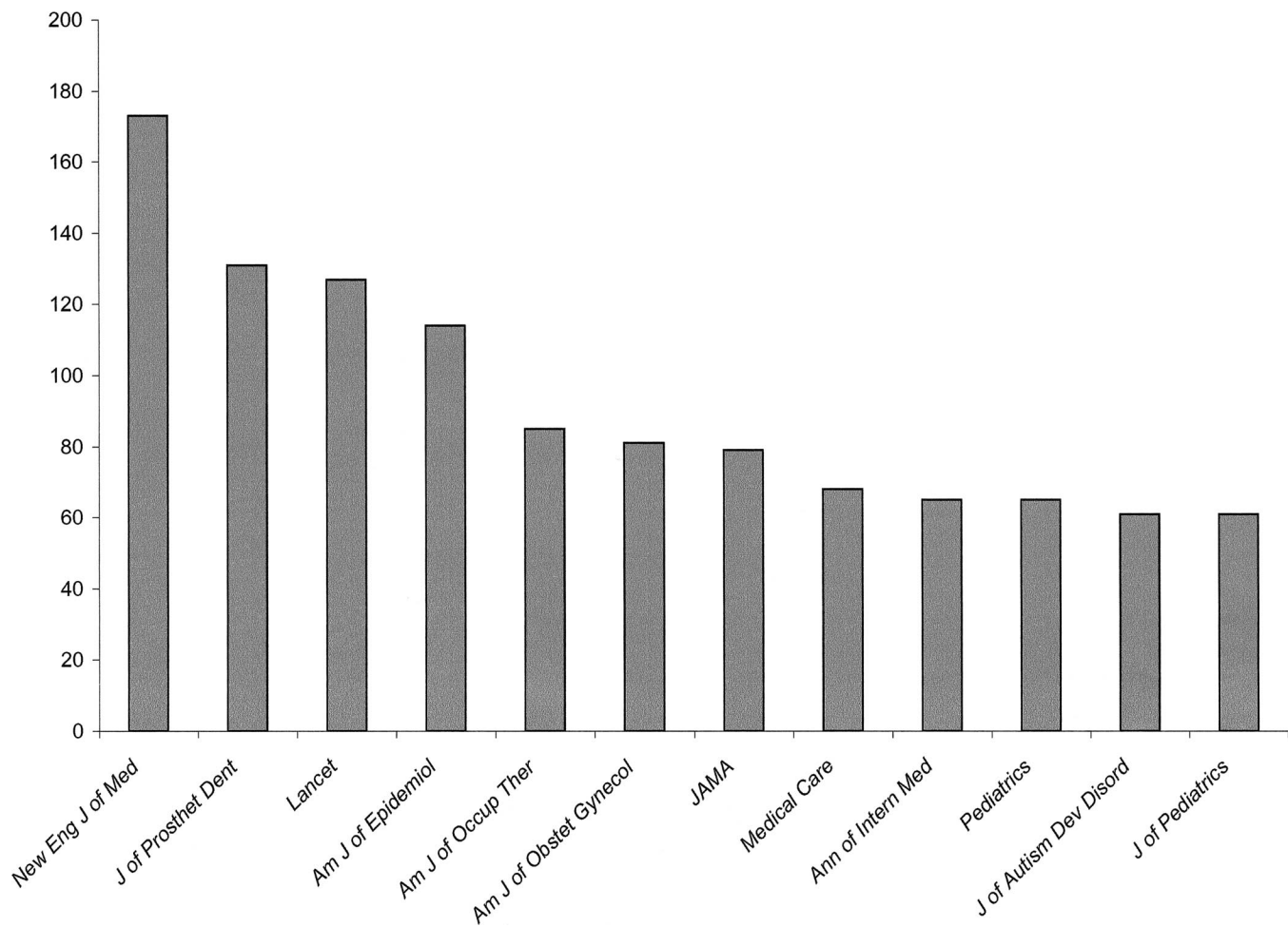
#### Turnaround time

Turnaround time is an important part of document delivery service; however, with the variables off-site storage presents, it is not always possible to meet twenty-four-hour deadlines. Problems, such as missing pages or misplaced volumes, will effectively lengthen the delivery time and should be considered when promoting the service to the patrons. A set of standard procedures for handling resends, incorrect and incomplete citations, and other common problems will reduce time and cost.

#### Patron expectations

Communication is important to reinforce and control patron expectations. Patrons need to know the differ-

**Figure 2**  
Titles accounting for the largest number of requests for retrieval of items from storage



ence between regular interlibrary loan and storage retrieval. If patrons will be charged for interlibrary loans and not for retrieved storage items, make sure information about the service and the cost to the patron is prominently displayed in writing.

Library staff who are planning for off-site storage should work closely with the circulation department. Different loan periods are often assigned to different materials. Workflow and patrons benefit from check-out services maintained by the circulation desk. UNC-HSL's interlibrary loan staff checked out books and journal volumes to the patrons as they arrived from storage. While this method was functional, patrons would have benefited from a due date that reflected the date the item was actually picked up.

### The facility

The storage facility should be experienced and able to accommodate expectations. "Low cost real estate and high density shelving will be economical only to the degree that they enable the delivery of information to those who use it" [1]. Storage staff should have the

necessary skills and library experience to successfully provide readable copies and scans. Equipment should include a high-quality photocopier and scanner to provide the best possible images. It is advantageous to have the storage facility equipped with compatible software to facilitate electronic delivery directly to the interlibrary loan office. Again, good communication and troubleshooting procedures should be in place to handle any problems concerning the transmission and reception of documents from the storage facility. Lack of training and procedures can lead to incorrectly shelved items, making them inaccessible, slowing the workflow of the interlibrary loan department, and increasing costs in borrowing fees. UNC-HSL incurred approximately \$5,700.00 in expenses as a result of unfilled storage requests.

### Cost

UNC-HSL's move was predominantly temporary (foreign journals will remain off-site indefinitely). A separate institution maintained the storage structure, keeping facility costs to a minimum. A contract needs

to be fully negotiated and in place prior to the move and should include an estimated retrieval volume, the quality of service expected, and a plan for handling common problems. When the expected volume of requests from UNC-HSL was more than estimated, the storage facility began charging \$8.31 per article, and it became less expensive to order items from the local consortium. A considerable amount of processing and delivery time was added to the workflow and placed a substantial burden on consortium colleagues. A well-planned relocation and detailed contract could have avoided these costs and inconveniences.

Another cost came in transporting the materials. Choosing a firm that specializes in moving library collections is a worthwhile expenditure, because these professionals can move the collection quickly and carefully in accordance with the specific needs of the library.

Despite these costs and problems, accessible off-site storage was economical for UNC-HSL. Ordering all storage requests through interlibrary loan at the average cost of \$9.50 (average not-for-profit fee of \$8.00 in-state and \$11.00 out of state) would have cost approximately \$127,518.50.

## CONCLUSION

Moving collections to an off-site storage facility is an option that many libraries are being forced to consider. The selection process for materials should include a study of user needs and habits based on, but not limited to, circulation and reshelving records. The top requested titles should be identified, so that larger runs of those titles can be retained at the expense of less used titles. Current titles that are available online or are duplicated elsewhere on campus should be considered for storage. A retrieval and paging system that allows patrons to browse volumes and materials at minimal cost to the library should be established. The quality and speed of service that will be maintained as well as the cost should be advertised to patrons.

Off-site storage facilities should be equipped with compatible software and quality hardware as well as staff trained to operate them efficiently. Staff should be trained in pertinent library skills to ensure the collection's integrity and accessibility. A contract should include estimated volume and desired quality, as well as standard procedures for handling and tracking common problems, and should be signed prior to occupancy. By carefully considering what is removed from the stacks and choosing a facility with well-trained staff and appropriate equipment to support the volume of requests for storage materials, libraries can minimize the inconvenience to their patrons and library staff and maintain high-quality service.

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## Site-ation pearl growing: methods and librarianship history and theory

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## INTRODUCTION

Citation pearl growing is the process of using the characteristics of a relevant and authoritative article, called a pearl, to search for other relevant and authoritative materials [1]. Site-ation pearl growing is the parallel process of using the characteristics of a relevant and authoritative Website to search for other relevant and authoritative Websites [2]. This paper offers proof that the Internet is a practical and helpful tool for health sciences librarians, describes and gives examples of several methods of site-ation pearl growing, and shows how many of these methods are rooted in librarianship history and theory.

## THE INTERNET'S RELEVANCE

Evidence is available that the Web is an important and accessible source of relevant and authoritative information. First, a proceeding published on the Cochrane Collaboration's Website recommends that systematic reviews "routinely" include an Internet search [3]. Second, government and nonprofit organizations—such as the National Library of Medicine [4], American Heart Association [5], and Agency for Healthcare Research and Quality (AHRQ) [6]—have Websites with full-text documents. Moreover, information on the Web is accessible because an ever-growing amount of reliable and authoritative information is included in the results of general search engines such as Google and

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Yahoo [7]. The following illustrates results from a search of Google without site-ation pearl growing.<sup>†</sup>

■ A search for ``Limited English Proficiency Diabetes<sup>‡</sup> yields a report from Health Care Task Force in Congress, which discusses the "Cultural Competency/Limited English Proficiency Standards" and plans for educating Hispanics about diabetes, published in 2002 [8]. The results also include a report from the Center for Medicare and Medicaid Services regarding the effect of low health literacy and limited English proficiency, complete with references to studies done with diabetic subjects [9].

■ A search for Diabetes ``Practice Guidelines'' yields full-text American Diabetes Association position statements related to clinical practice from 2004 [10] and Canadian Diabetes Association practice guidelines from 2003 [11].

■ A search for ``Thyroidectomy National Statistics'' yields statistics for thyroidectomies collected by AHRQ from 1993 [12] and by the Centers for Disease Control and Prevention from 1996 [13].

## METHODS OF SITE-ATION PEARL GROWING

Although general search engines can sometimes provide satisfactory results, site-ation pearl growing helps in searching the Web, because no search engine crawls all Websites [14] and search engines only bring some order to the "wildly disorganized" Internet [15]. Users who find a limited number of authoritative and relevant sites can use the process to find similar sites. Several methods of site-ation pearl growing exist.

### Deleting portions of the uniform resource locator (URL)

Sometimes searches on search engines reveal only a portion of the pages available on a Website. Therefore, a pearl's home page might have information not apparent in the original search. For example, the above search for thyroidectomy (``Thyroidectomy National Statistics'') resulted in AHRQ's statistics from 1993 [12]. Deleting the text after the last backslash, changing the Website from [www.ahrq.gov/data/hcup/93pcchp.htm](http://www.ahrq.gov/data/hcup/93pcchp.htm) to <http://www.ahrq.gov/data/hcup/> [16], provides access to AHRQ's thyroidectomy statistics from 2002.

### Linking

Websites that link to each other are often similar. A list of links to other Websites provided by a Website is called a "site-ation," similar to a list of citations to articles provided by an article. A Google search for `link:Website` finds pages that link to a Website. For

<sup>†</sup> The full-text of all the Websites described in the article is available for free, and all searches are accurate as of September 15, 2004.

<sup>‡</sup> In this article, Courier New font will be used to show verbatim searches and *Courier New italic* font will be used to show text that should be replaced by a user. Similar conventions are used in *Google Hacks* [14].

example, a user can find sites that link to the National Guideline Clearinghouse [17], a database of practice guidelines, by searching `link:www.guidelines.gov`. One of the results is a Webliography [18] of databases of practice guidelines, including the Centre for Reviews and Dissemination, which provides access to the Database of Abstracts of Reviews of Effects, National Health Service Economic Evaluation Database, and Health Technology Assessment Database [19].

### Using the pearl as a search term

A Google search of a Website's address can result in similar Websites. For example, a search for the American Diabetes Association's Website, [www.diabetes.org](http://www.diabetes.org), results in Websites for international diabetes organizations such as Diabetes UK, Diabetes New Zealand, and Diabetes Centre Australia.

### Using autonomous citation indexes (ACI)

Autonomous citation indexes (ACI), such as CiteSeer [20], allow users to perform site-ation pearl growing with scholarly papers posted on the Web. CiteSeer is a database that allows users to first identify a relevant article and then access a list of articles that cited it. For example, users interested in problem-based learning in medical education could search for ``problem-based AND medical education'' in CiteSeer's database. One of the results is the article, "Problem-based Learning: A Paradigm Shift or a Passing Fad?" [21]. CiteSeer can then display a list of articles that cited this article, which includes the research paper, "Skills to Enhance Problem-based Learning" [22].§

### Using subject directories

An example of a subject directory is the Librarians' Index to the Internet (LII) [23]. A professor at the Catholic University of America, School of Library and Information Science, described LII as

a good collection of [Websites] on various subjects. All resources are cataloged/indexed, annotated, and stored in a database . . . Users can search or browse the database and use the index terms for citation pearl growing. [24]

For example, users interested in insulin as a treatment for diabetes may enter `insulin diabetes` into LII's search engine. One of the results is a hyperlink to the Food and Drug Administration's guide to diabetes treatments [25]. Users interested in finding other Websites about diabetes can click the subject heading "Diabetes." One of the results is the American Diabetes Association. In addition, the terms in the subject headings may be used to search general search engines.

§ At the time of this writing, CiteSeer's scope was almost exclusively computer science.

**Table 1**  
Overlap in methods of site-ation pearl growing and citation pearl growing and librarianship roots

Site-ation pearl growing method	Citation pearl growing method	Common concept	Historical roots in librarianship
Using link: <i>Website</i> and autonomous citation indexes	Using Science Citation Index (SCI)*	Materials that cite/site each other may be similar in content	Eugene Garfield, an information scientist, introduced SCI in 1955 [28]
Using the pearl's subject headings in Librarians' Index to the Internet	Using the pearl's subject headings in a catalog	Materials that are indexed similarly may be similar in content	Charles Cutter published the first rules for subject headings in 1876 [29]
Using the Webliography of a pearl	Using the bibliography of a pearl	Materials that cite/site each other may be similar in content	
Deleting parts of the pearl's uniform resource locator (URL) to find a home page with a link to similar information	Using the table of contents of a book after finding a pearl in the book; the table of contents is essentially the book's site map	Materials that are in the same source may be similar in content	

\* Google's system of retrieval is built on the concept behind Science Citation Index. Citing the founders of Google [30], Min-Yen Kan writes, "Much in the same way that citations in one paper indicate that the cited paper is an authority, Google uses metrics based on hyperlinks to a document to determine its relative importance" [31].

## Using Websites' Webliographies

Websites sometimes recommend other Websites. For example, the American Heart Association includes a Webliography [26] of home pages from various organizations. The American Society of Echocardiography, Cardiovascular Research Foundation, and World Health Organization: Cardiovascular Diseases are included in the list.

## Analyzing text

Users can find keywords in the relevant Website and use those words in a search engine. For example, a user interested in hospital statistics can do a Google search for two phrases from AHRQ's home page: "quality indicators" and "hospital statistics" [6]. One of the results provides hospital statistics in Maine, presented by the Governor's Office of Health Policy and Finance in October 2004 [27].

## SITE-ATION PEARL GROWING AND LIBRARIANSHIP

Citation pearl growing, which librarians use regularly, and site-ation pearl growing, which might be unfamiliar to some librarians, overlap. In fact, some of the concepts underlying the site-ation pearl growing methods are rooted in librarianship history and theory, as shown in Table 1. This overlap shows that methods of searching the Internet are sometimes similar to methods of searching traditional sources of information.

## DISCLOSURE

The author owns one share of Google, Inc.

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## ParsMedline: establishment of a Web-based bibliographic database related to Iranian health and medical research\*†

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## BACKGROUND

Today, the importance of research in various fields is clear to everyone. When hundreds of thousands of articles in different fields are published each year, resulting in an increase of knowledge at every moment, practitioners run a risk of lagging behind and being backward. The capability of countries to present and publish their scientific research papers represents their scientific development. This is as true in the health sciences as in other fields.

Improved health depends on finding about its determinants and the application of this knowledge in the prevention and treatment of disease. This understanding depends on the dissemination of research findings and the status of existing information. Identifying

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tification, planning, implementation, and interpretation of individual research studies all depend on ready access to all of the relevant existing research knowledge.

Although global spending on health research currently totals some \$60 billion (US), less than 10% of it is directed to the diseases and conditions of 90% of the global population [1]. Many biomedical researchers in developing countries are professionally isolated by difficulties in accessing, generating, synthesizing, and disseminating information. Easy access to reliable health information for health workers in developing countries is the single most cost-effective and achievable strategy for improving health care in these countries [2]. In the medical community, bibliographic databases are widely accepted as the most important source of information. An enhanced opportunity to access and distribute data and information now exists in the rapidly expanding Web infrastructure.

With close to 81 local medical journals by the year 2004 (none of which are indexed in MEDLINE), Iran is faced with a great challenge in trying to improve the quality instead of the quantity of its local medical journals. In recent years, Iran has substantially increased its presence in world science, according to papers indexed by Thomson ISI between 1981 and 2002. That is just one finding in a new Science Watch survey examining the output and impact of a selected group of Middle Eastern nations over the last 20 years. Iran's output in science—although still comparatively small—has dramatically increased in the last decade, more than tripling from the 501 papers indexed in 1996 to a total of 1,830 in 2002 [3].

From 1991 to 2002, 2,060 articles from researchers working in Iran were indexed in MEDLINE. The number of these articles increased from 44 in 1991 to 508 in 2002. Of these, 85% to 91% were original articles, and this proportion was roughly constant throughout this period. The total number of articles published in the authors' country from 1991 to 2002 was 8,615, 5,122 of which were original articles. The number of original articles and proportion to total publication showed a significant increase in this decade, from 127 to 1,140 and from 36% to 79% [4].

The number of theses and presentations at seminars also dramatically increased, but access to these, especially journal articles, is very difficult. Researchers in our country have easier access to foreign articles than to the results of domestic researchers because of easy access to MEDLINE and other electronic sites.

With the aim of enabling researchers in the field of health and medicine in our country to gain access to research papers in this field, ParsMedline was designed in early 2003 and became functional in September, the same year. Our long-term mission is to convey data and results of new studies to the scientific community, students, and research centers in particular and our whole society in general. The purpose of the project was to establish a Web-based bibliographic database related to Iranian health and medical research

to facilitate access to that information, particularly for improvement of the quality of life of our community.

## PROJECT ORGANIZATION

In November 2002, a team consisting of three physicians, one computer software engineer, and one medical student, after reviewing other national and international bibliographic databases, such as IranDoc and PubMed, wrote a strategy plan for the most important processes including:

1. receiving and preparing documents,
2. indexing,
3. information processing, and
4. establishing databases.

First, we contacted the deputy of research or other persons responsible for statistics and information at all Iranian medical universities and requested access to their data. During the process of data acquisition, we designed a form in Microsoft Access and began entering data. We designed the ParsMedline site (Figure 1) and database using Dot Net and SQL-Server technology.

## SCOPE OF THE DATABASE

Our database includes the bibliographical information for:

1. health and medical journal articles
2. health and medical books
3. health and medical theses and dissertations
4. health and medical articles presented at seminars and summits held in Iran
5. Iranian health and medical articles published in creditable foreign journals

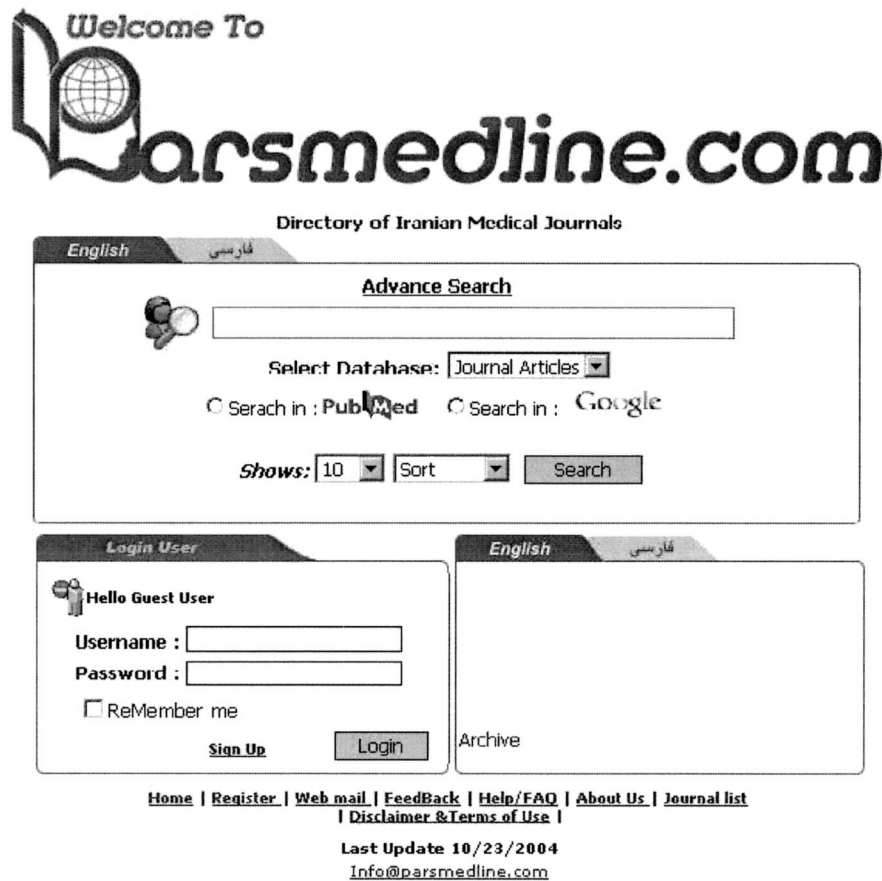
At the end of the first stage of this project (March 2004), our database consisted of more than 24,000 abstracts of journal articles in Persian and English, 4,000 full-text articles in portable document format (PDF), and bibliographic information for more than 25,000 theses, 2,500 medical books, 16,000 articles presented at Iranian seminars, and 3,000 articles published in international journals by Iranians (Table 1). The database comprises more than 79,000 bibliographic descriptions from the years 1978 to 2004. ParsMedline's specialty fields include medicine, nursing, dentistry, microbiology, virology, special health care system, nutrition, pharmacology, health, laboratory technology, speech therapy, audiometry, physiotherapy, and more. More than 95% of the indexed articles have abstracts and about 33% of them include full text. We hope that by the end of the year, this reaches 100%. The Persian journals include both Persian and English abstracts. About 1,000 records are added to the site every month. The database is accessed approximately 100 times every day.

## SEARCHING FEATURES

In the health and medical journal articles section, the most important database of ParsMedline, a user can search the database by year, number and volume of



**Figure 1**  
Home page of the ParsMedline site



publication, title, abstract, keyword, page, or author. More than 90% of the journals are in Persian. Results can be sorted in a variety of bibliographic formats.

## PROBLEMS AND ISSUES

Almost all Iranian health professionals and physicians who work in Iranian medical universities have access to the Internet, and their most common activity is searching for references relevant to their scientific and research activities. MEDLINE, the most important index in health sciences, uses Medical Subject Headings (MeSH) to increase the validity of search results [5]. We did not use MeSH in the first stage of our project but are trying to use the Persian Medical Thesaurus (produced by the Iranian National Library) for increas-

ing the validity of Persian search results. This work is almost complete and will be used in ParsMedline as soon as possible.

We have had a number of problems with this project. One of these was that the available Persian journals and articles had no fixed or proper format. Even though all are supposed to abide by the "Tehran Protocol," most of them do not [6]. For this reason, authors, address, affiliations, references, and so on had different formats. The second problem was the lack of electronic article files or the use of uncommon file formats (e.g., Persian Zarnegar software, Word 3.1, etc.) that could not be converted to common file formats such as Word 97, PDF, and so on. The lack of a reliable Persian optical character recognition software made our problem more difficult.

**Table 1**  
Distribution of bibliographic information of data present in ParsMedline until March 2004

	Journal articles		Congresses and seminars	International articles	Theses	Medical books	Total
	Abstracts	Full texts					
Persian	14,082	3,952	16,530	—	26,377	1,127	62,068
English	11,293	588	—	3,120	—	1,749	16,750
Total	25,375	4,540	16,530	3,120	26,377	2,876	78,818

## FUTURE DIRECTIONS

The strategic issues that need to be addressed in the next two years include:

1. recruiting new human resources
2. increasing public budget allocations
3. incorporating information technology in data collection, acquisition, and storage
4. disseminating multilingual information
5. moving toward an open access strategy

Because of various obstacles, especially economic, the ability of universities to address these challenges is limited. ParsMedline is a national and international project and needs national effort to be completed. We propose establishing a unique committee dedicated to creating, implementing, and advancing the highest standards in the conduct of research publication in Iran.

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