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"Holistic Collection Assessment" Andrea Hudson;

"Sharing Knowledge and Expertise Across Departments Susan M. Frey;

"Piercing the 'Wall of Rational Ignorance'" Barbara Wilson and Elizabeth Freeman;

"A Model for Journal Selection" Bill Myers and Deborah Cole.

Moderated by Ty Webb (InfoWebb), 2003 Conference Planning Committee.

Speakers:

| | |
|-------------------|-------------------------------|
| Deborah Cole | Oak Ridge National Laboratory |
| Elizabeth Freeman | CRA, Inc. |
| Susan Frey | DePuy, Johnson & Johnson |
| Andrea Hudson | University of St. Thomas |
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Sharing Knowledge and Expertise across Departments: Creating a Database to Address KM Issues and Concerns

Susan M. Frey, MS, MLS
DePuy, Inc., a Johnson & Johnson Co.

ABSTRACT

What do information professionals do when their clients cry, “We are wasting time and money tracking and re-tracking the *same* information!” At DePuy Orthopaedics we teamed up with colleagues from other departments to devise a knowledge-based solution to the problem. Over the years individual departments within the company attempted to manage their information needs by tracking the information themselves, many without the benefit of information technology or a standardized methodology. This created information isolation within each department. To remedy the situation the Clinical Research Department approached Technical & Business Information Services and asked if we would be willing to apply our expertise to help find a solution to this problem. This was an opportunity for the DePuy information professionals to contribute in the development of a key knowledge management project by collaborating with colleagues from other departments to devise a plan for locating the data and making it available to *all* employees on a web-based platform. Effective knowledge management builds not only on those with informational, behavioral, and technological expertise but also on people with valuable, often undocumented institutional knowledge. Because of this, interdepartmental teamwork is vital in developing and maintaining knowledge systems within an organization. This paper describes the Product Article Database Project to date and reviews aspects of what we learned of the information professional’s role in the processing, preservation, and distillation of knowledge.

INTRODUCTION

In the spring of 2002 the Statistical Director of the Clinical Research Department of DePuy Orthopaedics approached the information professionals in Technical and Business Information Services to ask if they could help devise a strategy for handling the tracking of papers about clinical trials of DePuy orthopedic products. Clinical Research wasn’t the only department in need of clinical information. Over the years individual departments within the company had attempted to manage their information needs by tracking the papers themselves, many without the benefit of information technology or a standardized methodology. This created information isolation within each department. Associates who were more than willing to cooperate with each other in sharing these papers did not have an established vehicle to perform such a charge and so there was much redundancy in the tracking and re-tracking of the information. The papers were stored in the file cabinets, binders, and folders of a variety of individuals and teams throughout the company. Instead of having a central source to consult,

one had to rely on the institutional knowledge of others. Often new employees approached seasoned associates to pick their brains on ‘who worked on the project’ in order to identify and locate the information. Even then, it was unclear if the associate consulted had collected all the relevant papers. It was evident that, in spite of the strong collegial rapport between departments, critical information was being overlooked because the gathering and dissemination of these papers was being performed on an ad hoc basis. In this paper I will describe the Product Article Database Project designed to address this problem and explore what we learned of the information professional’s role in working with colleagues from other departments in the management of knowledge.

THE COMPANY

DePuy Manufacturing was founded in 1895 in Warsaw, Indiana. The company has grown from a small, family owned business to become a world leader in the design and manufacture of orthopedic devices. In 1998 Johnson & Johnson purchased DePuy, making it a part of the international family of companies under the J&J banner. Johnson & Johnson has a unique organizational structure for a company of its size. It is made up of 37 global affiliates with 198 operating units, each of which is autonomous and accountable for individual performance. Thus each operating company maintains a small company atmosphere.

Today DePuy has grown into the following operating companies: Codman & Shurtleff, which provides for the surgical treatment of central nervous system disorders through a wide range of products such as neuro endoscopes and drug deliver pumps; DePuy ACE, a world leader in specialty orthopedic trauma products; DePuy AcroMed, manufacturer of implants and technologies for the treatment of cervical, thoracic, lumbar, and sacral spinal pathologies; DePuy Casting, manufacturer of a complete line of fracture management products; DePuy Orthopaedics designer, manufacturer, and distributor of orthopedic devices and supplies including hip, knee, ankle, shoulder, wrist, elbow, and finger replacements; and DePuy International, which represents the products and culture of DePuy in all markets outside the American continent.

The data needed for this project is located in published scholarly literature, papers presented at conferences, and internal white papers. While the company closely follows published clinical data of competitor products, tracking the clinical papers of DePuy products is critical. This information is vital to many departments. Regulatory bodies, such as the Food and Drug Administration, require strict testing and post-market surveillance of medical devices. The clinical and regulatory departments track and compile these papers to comply with international and federal regulations for product efficacy and safety. The research and design professionals use the data to evaluate existing design rationales and new product development. The sales and marketing departments use clinical papers to help bring the products to the consumer by promoting them to surgeons.

The information professionals serving the DePuy operating companies are part of the Technical and Business Information Services department, or TBIS. TBIS staff members are in one of two locations — Raynham, Massachusetts, and Warsaw, Indiana. There is a library at both locations. Warsaw-based staff members primarily serve the information needs of the

Orthopaedics and ACE companies, which are headquartered in Indiana. Raynham-based staff members largely serve the Acromed, Codman, and Casting companies in Massachusetts. Staff members from both locations work seamlessly with each other across geographic lines. The TBIS is a single department with a single service mission, collection policy, instruction and outreach program, and web presence. TBIS staff also liaise with the Leeds, UK-based information professional, who provides for the information needs of DePuy International.

PROJECT PLANNING

The TBIS began meeting with Clinical Research to discuss the parameters of the project. It was immediately evident to both departments that a searchable database of full text scholarly articles, conference paper abstracts, and white papers could serve the needs of the entire company. By collecting the data and mounting it on the DePuy Intranet it would be possible to bring the information to everyone's desktop. This instrument was named the Product Article Database. During the first meeting TBIS held with Clinical Research the information professionals had, within minutes, defined the information resources to be consulted. The TBIS staff was already locating scholarly articles for users by searching medical databases such as Medline and Embase. Conference proceedings were found by searching databases, and by keeping a watchful eye on the annual proceedings of leading orthopedic associations. White papers, which are not kept in the Raynham or Warsaw libraries, would have to be collected. In defining these resources we were simply doing what information professionals are trained to do — locate the information using the most efficient method of data retrieval.

How to package and deliver the information to users became the next consideration and in this respect the TBIS needed to work closely with Clinical Research on mapping out the information seeking behavior of users. The TBIS is a special library and, as such, is heavily committed to a service mission. For employees who prefer to search end-users databases themselves the TBIS does conduct bibliographic instruction. But the majority of our users ask us to deliver the information to them rather than teach them how to access it on their own. Therefore any database we construct, if it is to be truly accessible to all employees, must be flexible enough to appeal to the experienced and novice user. Clinical Research requested that the information to be only a few mouse-clicks away from users. Another important consideration was the fact that our users would not be conveniently thinking in MESH or LC subject headings. Indexing would have to be tailored to meet their specialized needs. The TBIS would have to use "product speak" in designing a thesaurus of terms for this database. To do this we would have to consult representatives from the various departments who use product terminology in subtly different ways.

We also realized that we would need copyright permission to offer full text access of published articles and abstract. The white papers posed no problem since the company already owned them. We planned to link the bibliographic records to full text articles or abstracts on systems where we had copyright clearance to do so. In cases where we didn't have the copyright clearance we would still include the bibliographic citation in the database. Electronic availability is also an issue. Where linking to an existing electronic document was impossible, such as with our unpublished white papers, we planned to create the PDF's on a web server. After a few

phone calls we were granted permission to load the PDF's on a server located in Raynham, Massachusetts.

Starting from scratch always seems daunting. DePuy's product line, including now discontinued devices, is quite large and the data to be collected would comprise a small library. We were faced with a tactical project management assignment. One part of the planning phase was already accomplished. We had defined the project, which was to create a searchable database of articles and white papers pertaining to DePuy products that would be accessible to employees at their desktops. We still needed to break the project down. Clinical Research and the TBIS listed and sequenced the summary tasks:

- search for published literature in bibliographic databases and collect the white papers
- set up an interdepartmental team to evaluate the search results for inclusion in the database
- locate or create the electronic full text documents
- ask departments to send PDF's of their white papers to the TBIS
- create a bibliographic record for each article and white paper
- link the record to the full text document
- mount the database on a web-based platform
- devise a plan for the ongoing management of the database

SOFTWARE AND HARDWARE CONSIDERATIONS

Clinical Research asked the TBIS to evaluate and recommend the best software to meet the requirements of the project. We recommended the system we were already using to catalog the library collection and manage serials — BiblioTechPRO, an Inmagic Inc. product. BiblioTechPRO is an integrated information management system allowing for a wide variety of functions. It is a client/server application that supports a web browser. To make the database accessible to our users via an Intranet browser we use BibSpeed, a web-enabling option for searching the BiblioTechPRO database. The TBIS began using BiblioTechPRO in 1998. In 1999 we acquired BibSpeed and since then it is available on the TBIS Intranet where DePuy employees, either in the library locations or at their own desktops, can search the online catalog and consult the serials list.

One feature of BiblioTechPRO makes it particularly appropriate for this project. It has a powerful thesaurus module. The thesaurus window displays a tree of related terms that is useful for the cataloger. With this module we could create a relational thesaurus of product terms. We also realized that the end user interface of the system was highly appropriate for our needs. BibSpeed sends a user request to the database server and a result list of brief citations is generated. Every citation is hyperlinked to the full citation and can also be linked to full text files, or an external resource located by a URL. This feature would be critical in linking the bibliographic record to full-text documents on the web server in Raynham. BibSpeed allows users to search by Boolean operators and a range of criteria such as date and material type. The system's capability to display a number of different search templates would give us flexibility in allowing users to access the Product Article Database in a variety of ways. One important

feature is its capability to link index terms to set bibliographies, which would allow us to create predefined or “canned searches” by general product terms.

If we used BiblioTechPRO and BibSpeed we could incorporate the records pertaining to this project into our online catalog. By adding a product term field to these records we could isolate them, making them distinguishable from the rest of the catalog. Thus the Product Article Database could be integrated into the online catalog while still being a distinct entity. This was an important consideration that served a number of purposes. By proposing to make the Product Article Database a part of the established online catalog we would be exploiting the powerful functionality of this software. Since the TBIS was already promoting the BibSpeed interface, many of our users were already accustomed to the screens. Therefore we’d be making use of an existing technology, which is a time saving and cost effective practice. We also wanted the online catalog to be a centralized source of information. Users who would be unfamiliar with the Product Article Database but who might consult the online catalog for books might serendipitously happen upon a useful product record. So rather than look outside for additional software we realized that the best tools for this project were already at our fingertips. The TBIS staff explained how BiblioTechPRO and BibSpeed could meet the requirements of the project and Clinical Research agreed.

With the software application decided upon we then had a simple model of proposed data flow (figure 1). The TBIS Intranet would be the conduit through which the data could be accessed. But the team had one more software issue to handle, one that addressed the mechanics of data evaluation and manipulation. We needed a process by which we could gather the data electronically and eventually input it into BiblioTechPRO. We realized that to generate bibliographies from sources such as Medline, and then try to enter the records manually into BiblioTechPRO would be unnecessarily time-consuming. Besides, we didn’t wish to automatically enter records into the Product Article Database until an interdepartmental reviewing committee had first evaluated them. This database was to be created for our users and we needed them to be involved in the selection of materials. But we did not wish people outside of the TBIS inputting data directly into the library catalog. We therefore needed an interim step between collecting the data from outside information sources and entering the data into our database. To do this we decided to use bibliographic software that would house the collected data during the evaluation process. Once captured the records could be manipulated before then being batch loaded into BiblioTechPRO.

After reviewing what was available we decided to use ISI ResearchSoft’s Reference Manager to stage the records during the evaluation process. Reference Manager is popular as a tool for creating bibliographies. The software allows for the importation of files from a variety of outside sources, such as Dialog and the catalogs of large research institutions. If we chose to perform multiple searches we could use the software to find and eliminate duplicate records. Bibliographies can be passed over a network, making it a convenient tool for sharing. Another strong point to Reference Manager is that if our users wished to contribute to the data collection process, Reference Manager would be the tool we would propose they use. Since our users are highly trained specialist we wanted their input and participation in this project. But while the TBIS had no objection to reviewing committee scanning suggested bibliographies from users, we were unwilling to allow users direct access to BiblioTechPRO. Any untrained activity there

could wipe out or corrupt our entire online catalog and serials management system. So by using Reference Manager to stage the records for evaluation we would be allowing our users more participation in the data retrieval process. But loading the records from Reference Manager into BiblioTechPRO posed a problem. There existed no convenient way to do this until Inmagic agreed to create a filter for us. With this filter the information professionals would be able to convert Reference Manager records into BiblioTechPRO.

REFINING THE PROCESS

With the selection of the Reference Manager software we were ready to list the subtasks for the collection, evaluation, and delivery of the data (figure 2). DePuy white papers were to be collected and scanned into PDF by the various departments and then later cataloged on BiblioTechPRO. TBIS Information professionals were to search for the published data and store the citations in Reference Manger. These citations, and the corresponding hard copy full text documents, would be sent to an interdepartmental reviewing committee that would meet periodically to vet records for this project. Rejected citations would be removed from Reference Manager. Approved citations would be batch loaded from Reference Manger into BiblioTechPRO. Product terms would be assigned to each new record in BiblioTechPRO. If we had copyright clearance to do so, records would be linked to either a PDF or HTML text file. Users could then access the records and documents via BibSpeed.

As straightforward as this process appears, we knew that there were many hidden complexities. Consider the seemingly simple task of searching for clinical trials of DePuy products in bibliographic databases. This is a massive, complex job. We didn't want to begin compiling extensive bibliographies pertaining to all the product lines from such sources as Embase before we had designed a fairly detailed process and tested it. So we decided to run a focused test. We separated the product literature into two categories — retrospective and ongoing. Retrospective literature would be collected first. We further broke the literature down by product type such as hips, knees, and extremities. Rather than collect all retrospective literature on all DePuy orthopedic products at once and load them onto our online catalog, we decided to test the data collection and delivery process by focusing on only retrospective literature pertaining to DePuy hip products. We would carry these data through the whole process so that we'd be able to evaluate the tasks we had outlined.

The test would also allow us to experiment with different interfaces on BibSpeed. Users were already linking keywords with material type, such as books and videos, and we could easily list the new material types of white papers and journal articles on the search screens. But Clinical Research also wanted users to have a more focused way of searching that conceptually separated the Product Article Database from the rest of the online catalog. For this the TBIS proposed an additional screen listing the product names that would be linked to the corresponding records. This screen is the "canned search" previously mentioned. Experienced users would also be able to locate the product related records by using BibSpeed's powerful browse function. This feature allows users to select a field, such as title, subject, or series, and browse it's index. Since we planned to incorporate a special product terms field in addition to a

subject-heading field into these records, users could scan the product thesaurus we planned to create.

Focusing, then, on only retrospective, published clinical data pertaining to DePuy hip products we searched medical bibliographic and full text databases and publisher's websites for the appropriate bibliographic citations. These were cataloged in BiblioTechPRO and each record was assigned specialized product terms in a product term field created for that purpose. In the winter of 2002 the TBIS and Clinical Research ran the live test at a meeting of representatives from various departments to get their impressions and feedback. Choosing *Product Articles* from the BibSpeed main menu brings the user to the "canned search" screen in which DePuy products are listed (figure 3). For the test the only active link was to records pertaining to DePuy's AML hip products (figure 4). Following this AML link takes the user to a results list with the brief citations (figure 5). The user can either expand the brief citation to see the full bibliographic record, or link to a full text document. Thus the "canned search" screens pertain only to the Product Article Database. But since the product records are incorporated into the online catalog, users can also locate them through alternate means. If users choose *Key Word Search* from the BibSpeed main menu they can uncover these product records if they type in *AML* as a keyword. They might also locate additional records, such as videos and books. If they wished to use the keyword function and limit their search to the Product Article Database, they needn't be forced to use the "canned search" screens. While performing their keyword search they could choose *Journal Article* on the keyword search screen as their material type. This method would also retrieve the same AML Hip records that the canned search did (figure 6). Thus users could uncover the product records using a keyword approach, or isolate the product articles from the rest of the online catalog by using the "canned search" screens.

KNOWLEDGE REPOSITORES AND KM

Reaction to the test was very positive. Colleagues were generous with ideas. One thoughtful suggestion came from Hip Research & Development. They asked that notes about specific products and projects be included in the bibliographic records. For instance, background data about the AML Femoral Component, such as information on a supplier or the names of team members who worked on the initial design of the product, could be included in all records pertaining to that product. The TBIS information professionals responded by explaining that users would not be able to open up a record and input their own notes online. But we did see the value in asking the appropriate parties to draft background notes for us. The reviewing committee could evaluate these notes along with the published clinical papers. If accepted, the notes could be placed in the abstract field of the relevant records.

Until now, the idea of capturing knowledge stored in people's heads and converting it into documented information that could be stored and disseminated had not been planned for this project. The focus of the project had been to collect mostly publicly available data and store it in a readily accessible location for the convenience of our users. Hip R&D's suggestion is exciting since it proposes expanding the database from a storehouse of published data to also include the type of ephemeral, institutional knowledge that is a central concern of knowledge management. Including internal background notes in select records would enhance the Product Article

Database and transform it from an information management system into a knowledge management tool.

Since the focused test of AML product records the next step in the project is to discuss what needs to be done before the TBIS information professionals begin the retrospective searches of the other DePuy products. Clinical Research plans to head the formation of the interdepartmental reviewing committee. We also need to network with users to create a thesaurus of product terms for the other product lines. News of the project has spread and many departments are interested in hearing updates. Other DePuy companies are also interested in the possibilities of the Product Article Database.

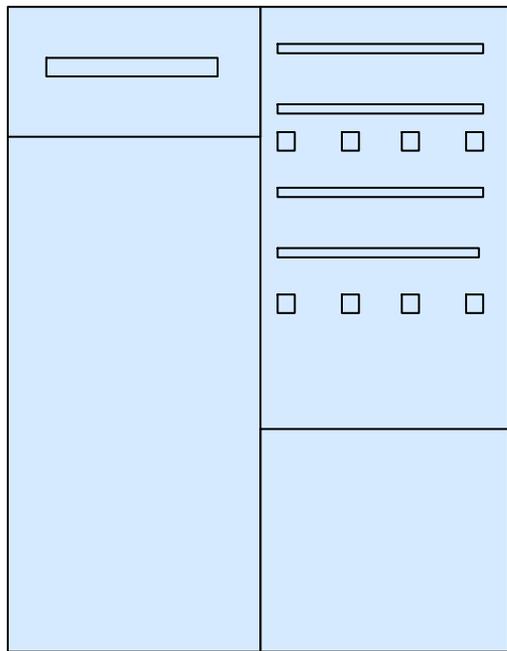
It is generally recognized that knowledge has two distinct qualities — explicit and tacit. Explicit knowledge is documented, structured, and disseminated, while tacit knowledge remains in the minds and memories of people.¹ The Product Article Database, by including employee background notes about specific products and projects, can draw on explicit knowledge and serve as a knowledge repository. The distinctions made between explicit and tacit knowledge has led some to take sides. There are those who believe that knowledge repositories play a small role in the effective dissemination of knowledge, and that only face-to-face interaction can keep knowledge alive within an organization.² However, it is more likely that, because of the complex nature of knowledge, a variety of approaches are required. I agree with those who believe that computerized storehouses of information coupled with practices encouraging ongoing communal exchanges are needed to preserve organizational knowledge. SLA advises that one role librarians can play in KM is in, “the evaluating of information software and sources of data prior to purchase, and [in] creating databases for organizations to access their internal information.”³ As an information professional I cannot ignore the necessity of capturing knowledge that would otherwise be lost. Librarians and archivists have been creating and preserving knowledge repositories years before the invention of the computer or the coining of the term, ‘knowledge management’. But I also believe in the necessity of practices designed to encourage communication links between people. The Product Article Database is a compelling example of what can be accomplished in an environment that fosters the sharing of knowledge across departments. It is clear that both Clinical Research and the TBIS Library brought different, but critical perspectives to this project. The information professionals were the obvious experts to consult in the planning of the information transfer, but the Clinical Research experts were the ones who continually reminded us of user needs and behavior. In addition, soliciting feedback directly from representative from other departments yielded comments and suggestion that will help to make the data robust.

ENDNOTES

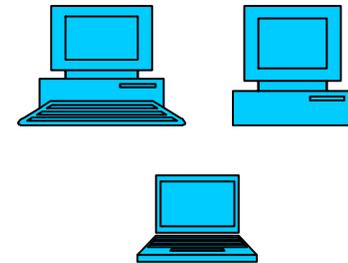
- ¹ Becerra-Fernandez, Irma. Organizational Knowledge Management: A Contingency perspective. *Journal of Management Information Systems*, Summer 2001, Vol. 18(1) p.25.
- ² McDermott, Richard. Why information technology inspired but cannot deliver knowledge management. *California Management review*, Summer 1999, Vol. 41(4) p.104.
- ³ Boeri, Robert, and Martin Hansel. Special librarians’ and enterprise knowledge management. *EMedia professional*, April 1998, Vol. 11(4) p.36.

DePuy Article Database - Data Flow

server located in Raynham, MA



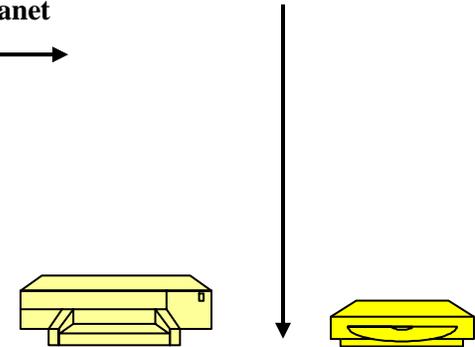
employee desktops and laptops at the various DePuy locations connected to the DePuy network



users access BibSpeed catalog via the TBIS Intranet to search Product Article Database



users download full text or abstracts via the TBIS Intranet



users print and/or save data

Figure 1

DePuy Article Database - Data Collection, Evaluation, and Delivery

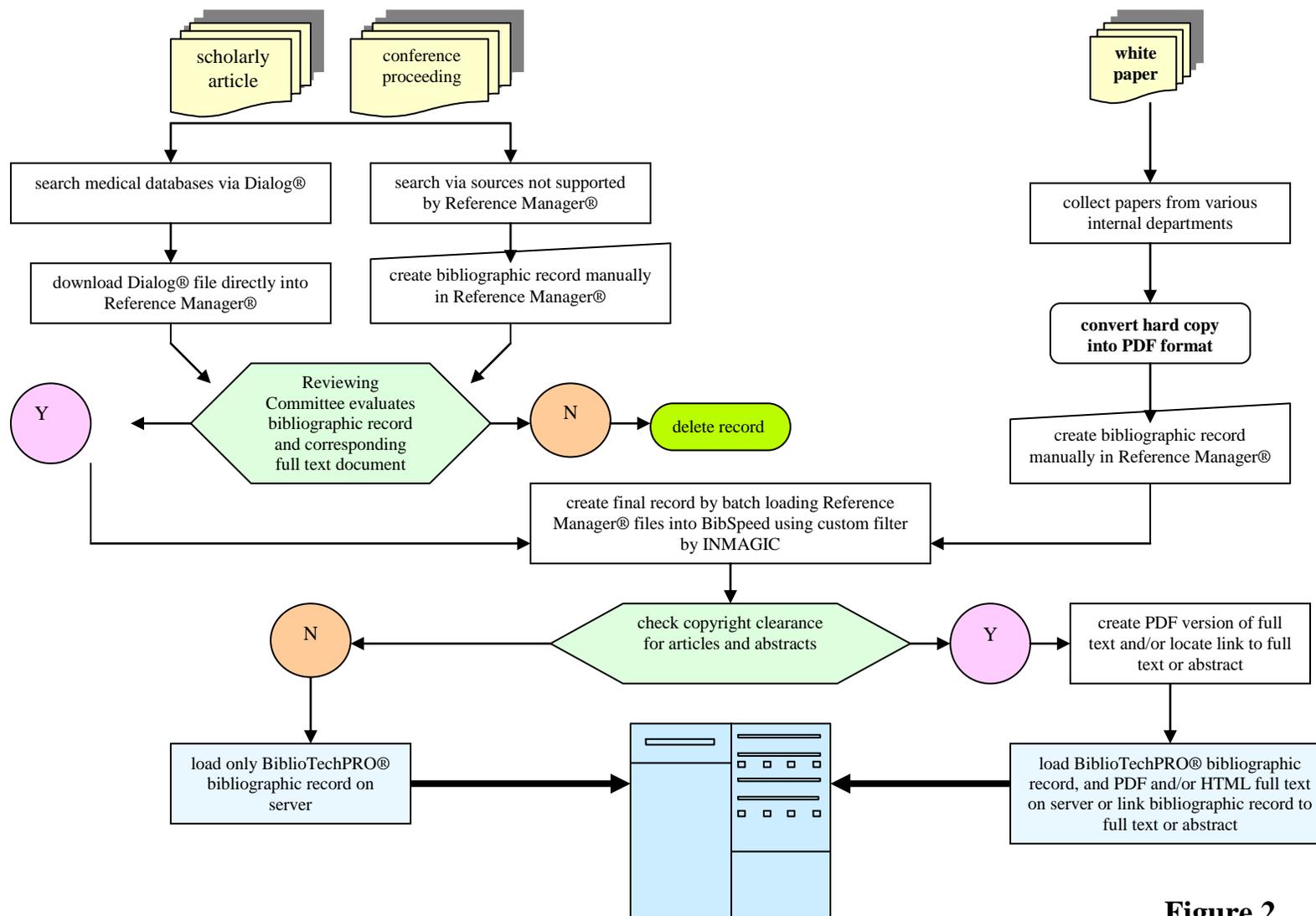


Figure 2

BibSpeed Online Catalog available via the TBIS Intranet

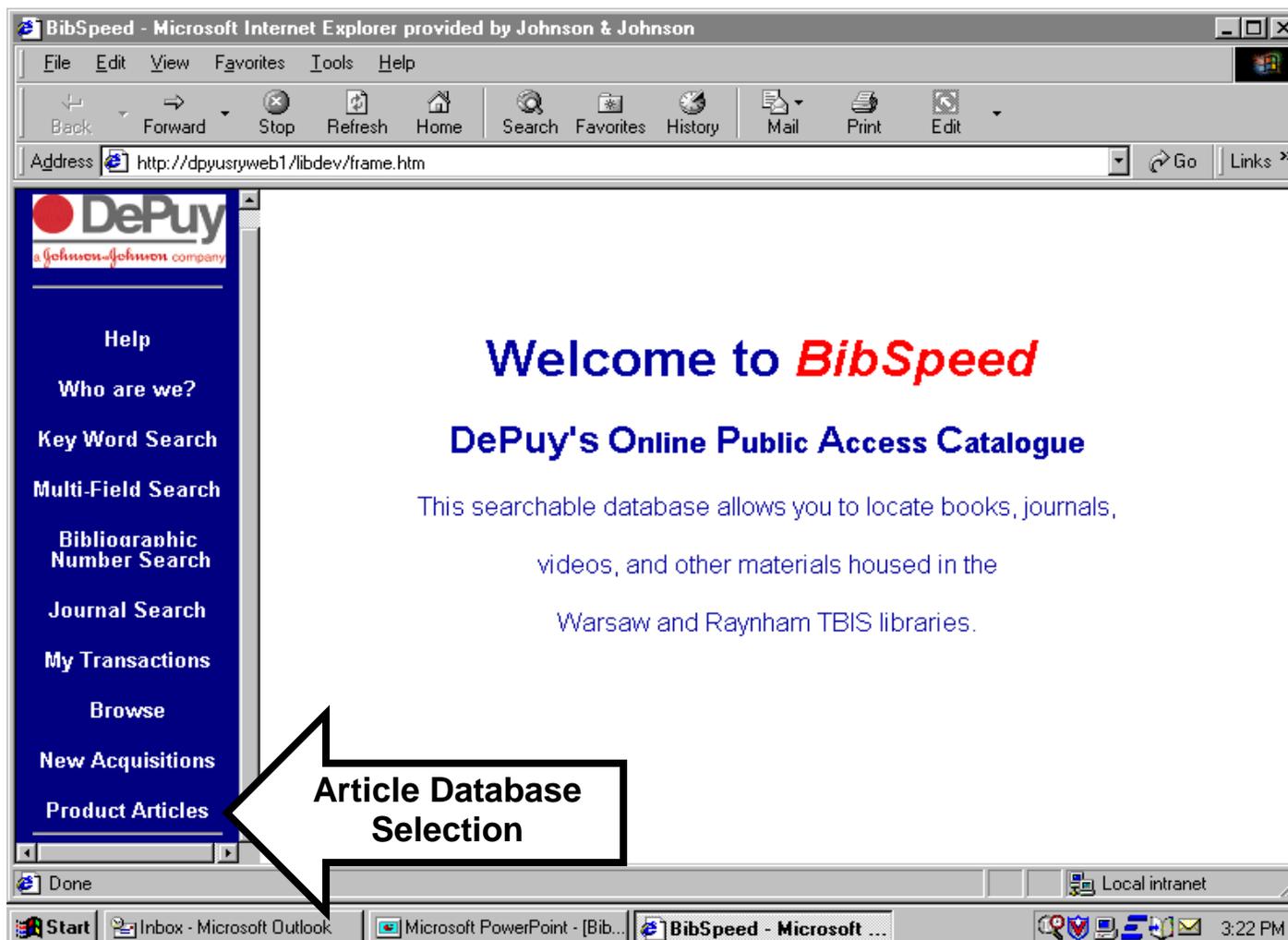


Figure 3

Article Database Selection Screen

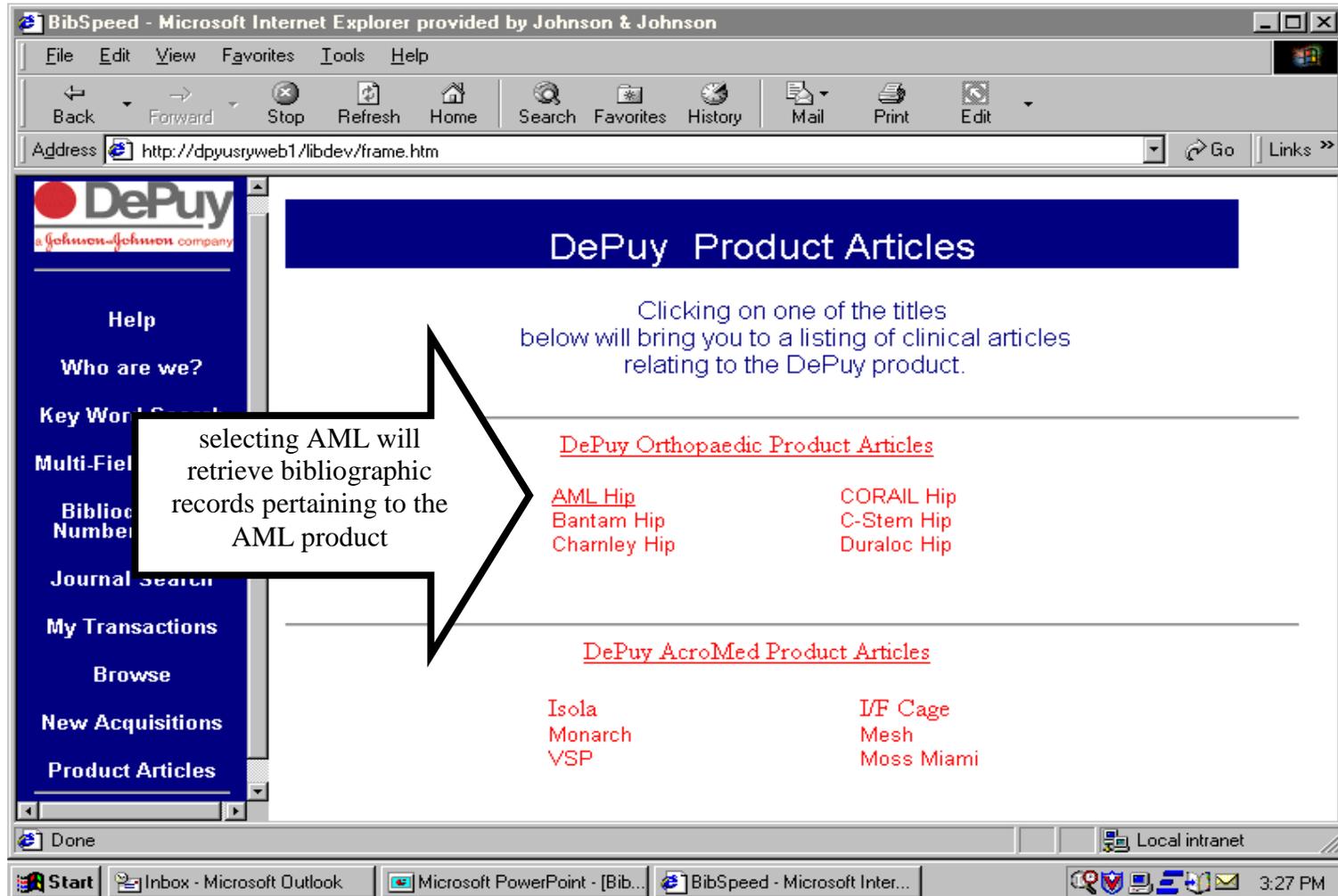


Figure 4

Result List of AML Records

BibSpeed - Microsoft Internet Explorer provided by Johnson & Johnson

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites History Print

Address <http://dpyusryweb1/tbic/frame.htm>

DePuy
a Johnson & Johnson company

Refine Search

85 items found.

[Journal Article] CID:6950 **PDF** link to full text PDF
Test Author
[Test Article Title](#)
Contained In: Journal Name, vol #, pp 1-2.

[Conf. Proceedings] CID:6949 **HTML**
Test Author
[Test Abstract Title](#)
Contained In: Conference Proceeding, year, pp 1-2.

[Journal Article] CID:6951 **PDF**
Test Author
[Test Article Title](#)
Contained In: Journal Name, vol #, pp 1-2.

[Reference] CID:6952 **HTML** link to full text HTML
Test Author
[Test White Paper Title](#)
Contained In: Depuy White Paper Collection, year.

Help
Who are we?
Key Word Search link to complete bibliographic record
Number Search
Journal Search
My Transactions
Browse

Figure 5

Alternate Search Method - Keyword Search

The screenshot shows the BibSpeed Keyword Search interface in a Microsoft Internet Explorer browser window. The browser title is "BibSpeed - Microsoft Internet Explorer provided by Johnson & Johnson". The address bar shows "http://dpyusryweb1/tbic/frame.htm".

The page has a blue header with the text "Key Word Search". Below the header, there is a navigation menu on the left with links for "Help", "Who are we?", "Key Word Search", and "New Acquisitions".

The main content area contains the following text and form elements:

To search by [Term](#), type any word, partial word or phrase. You can include names of organizations, topics, places, full or partial titles. The system searches for key words or phrases anywhere in the database records. Use an asterisk(*) to indicate truncation at the end of a term.

OR

Click [Personal Name](#) to search the name index and type last name first.

Search by: Term Personal

Search Term: Branch:

Sort search results by:

Click here to limit your search for two or more terms in the same field.

Type a date (mm/dd/yyyy) or a year (yyyy) in either or both fields to limit the search to information published in a [specific time period](#).

Start Date: End Date:

Search Limit:

Click the materials you want to include in your search. If no boxes are checked, the search returns ***ALL*** types.

Material Type(s):

Journal Article Book CD-ROM Conf. Proceedings Market Report
 Technical Reference Regulatory Standards Video Internet

Three callouts are present:

- 1 - select keyword search from menu (points to the "Key Word Search" link in the navigation menu)
- 2 - type AML in text box (points to the "Search Term" input field)
- 3 - choose journal article as material type (points to the "Journal Article" checkbox in the "Material Type(s)" section)

The Windows taskbar at the bottom shows the Start button, several application icons, and the system tray with the time 3:48 PM.

Figure 6