

## Creating Customized Shared Databases of Patent Information Using Lotus Notes

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In support of efforts to reengineer the patent process at 3M, Information Services Patent Services has taken a leading role in evaluating and implementing new technology to assist its clients in making effective use of patent information. Increased demand from users for more customized and faster access to information has led Information Services to reach beyond traditional information retrieval to enhance use of patent information products. Using Lotus Notes, commercially available software, and partnering with outside vendors has given 3M the ability to create customized shared databases containing abstracts, full text, and images of patents from around the world for individual business units. The new databases will help ensure that 3M researchers are aware of the art and accelerate the patent filing process.

### INTRODUCTION

3M's diverse research program has resulted in its offering over 60 000 products. Innovation has been the cornerstone of its growth as seen by the increasing number of patents granted each year, with over 500 patents in 1997. Although the importance of patenting is increasing, the business climate dictates the need to decrease the time from discovery to patent application. An Optimized Operations team was formed at 3M to evaluate the patenting process. They determined that it is imperative for researchers to be aware of the art in their area, not just at the point of filing but throughout their project. This knowledge can guide and accelerate their research by avoiding duplicative efforts and generating new ideas. The advent of new tools is for the first time truly decentralizing information retrieval and empowering the user with easy-to-use and accessible information.

Researchers at 3M have been receiving current awareness electronically for approximately 15 years. Experience in using the data has subsequently led them to want to retain, organize, and search the data for themselves. During this period the Information Services department has worked closely with the researchers to examine various options for achieving this ability, but it has been problematic. In particular, one of our database management systems was not supported by the corporate Information Technology (IT) department. Thus, Information Services had to install, train, and support the users as well as convert the data into the needed format. This conversion was difficult and very time consuming. Customization of the data layout was also very difficult, having to be done through the conversion programming, leaving an inflexible database design. All of this resulted in Information Services being able to support only a small number of databases and a small client base.

When 3M committed to Lotus Notes as its corporate platform for groupware, this offered Information Services an opportunity to reach even more users with a consistent interface and one with which they were already familiar. While others in the department found the tools to build patent information databases using Lotus Notes, my involvement

began because of client requests for assistance in database design. 3M policy encourages employees to spend up to 15% of their time working on exploratory projects. I spent my "15% time" developing a patents database template and a system for building patent databases. This has since grown in the past year into an official Information Services department project with a team of six people continuing its development into a full-blown service.

Lotus Notes is known as groupware because it is primarily used for sharing information among individuals, teams and departments.<sup>1</sup> Notes offers e-mail and scheduling but more importantly it can be used to create, access, and manage shared databases. The database is located on a Lotus Notes server that is accessible via the company LAN to many people. Using an access control list, the database administrator determines who has access to the database and what rights they have, from reading only to adding or editing data. Notes can combine data from a wide range of sources and formats including text, tables, and graphics. Using Lotus Notes Domino, databases can be accessed using standard web browsers so Notes is not necessarily required on the user's PC. Overall, Lotus Notes is highly intuitive, using point-and-click rather than command-driven technology.

### BENEFITS OF A LOTUS NOTES PATENTS DATABASE

Among the benefits of using Lotus Notes for managing patent information is dynamic analysis. In filing paper copies, the filing system becomes the retrieval system. If the patents are organized, for example, by patent number, it is necessary to know the number to retrieve a document. Notes sorts data by Views on the basis of fields in the document such as patent number or assignee. It is easy to change between Views with a mouse click. Meaningful keywords can be added to a record on the basis of the researcher's interests or by using the company's terminology and a View created to sort the records on this keyword. For complete retrieval, Lotus Notes also allows full-text searching of the documents.

Another benefit is that Notes functions as a true knowledge management tool. A new team member or a researcher starting a new project has immediate access to the most

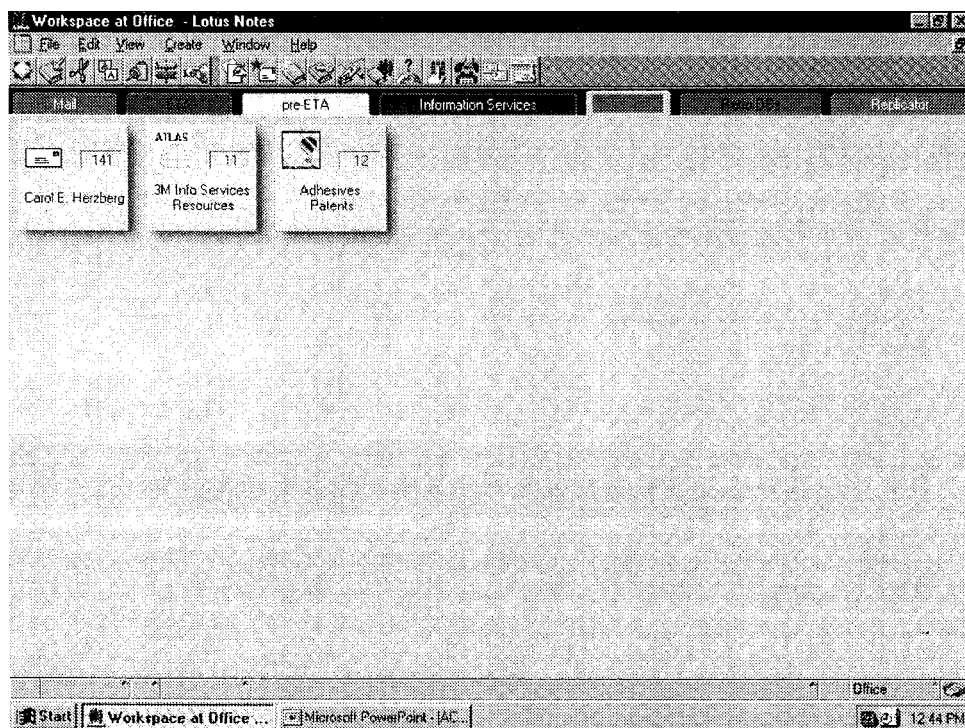


Figure 1. Lotus Notes workspace.

pertinent prior art helping to guide their research. Each database contains an "About" page. "About" pages contain information about what is in the database, how to use them, and the search strategies that were used to gather the data. This central repository of patent information means individuals no longer have to maintain their own file of paper copies. Instead, the information is shared with others irrespective of whether they're in the same group, division, or even country.

#### DATABASE APPLICATIONS

For these databases to be useful they need to be highly focused. It is important therefore that intellectual effort is applied to the information to evaluate, filter, and understand what is in the database. At 3M, all input data is carefully evaluated for selection by the researchers before addition. Any irrelevant data from retrospective searches or current awareness profiles is discarded. With this high level of relevance, users can easily browse the reviewed information that has been added on a weekly basis. Thus, there is a high degree of effectiveness because the database is a compilation of what is considered pertinent. However, it is important to educate database users that the data reflects the researcher's interests, which can change over the course of a project. This is not a comprehensive set and should be used only for browsing not patentability searches.

The majority of the databases are based around a specific technology, for example urethane hot-melt adhesives. Although a project team or work group can share a single database, these databases may also be accessed by staff from other divisions because many projects cross divisional lines. Having a centralized database with one person managing the data saves a considerable amount of time and money. Occasionally, some users want a database simply to handle their individual current awareness. This gives researchers a

means of managing their data, but access can still be given for others to read. Databases based on a one-time retrospective search allow researchers to filter the data, deleting unwanted references, and sorting and categorizing remaining documents. For large data sets this can lead to a much better understanding of their area. Often, once the researchers see the usefulness of the database, they will want to keep the information up to date by adding current awareness. Very often our own patents are the best prior art, so some of the databases are of the division's own patents.

It was estimated that each database would contain approximately 1000 records. A year of building these has resulted in a wide range of sizes, from dozens to thousands of records. Most are in the 300–600 document range. The point has not been reached where the size was so large as to be too cumbersome to be useful. When that does happen, we can separate the database into subsets, each focusing on one aspect. This could be done easily if the researchers have applied keywords to the documents. Server space has not been an issue yet but may be in the future as interest in this application is growing rapidly.

#### LOTUS NOTES DATA SOURCES

The core content of 3M's patents databases is abstracts, searchable full text, and images of patent documents. The success of this project has been dependent on working closely with two primary source vendors, Derwent Information Ltd. and Micropatent. Derwent is now delivering both retrospective and current awareness data from their World Patents Index database to us in Lotus Notes format. Micropatent provides 3M with the searchable full text of U.S., European, and World documents in Lotus Notes format along with the full patent image. Even when the full text is available, the Derwent record is also added to the database because of the value of Derwent title, abstract, and patent family informa-

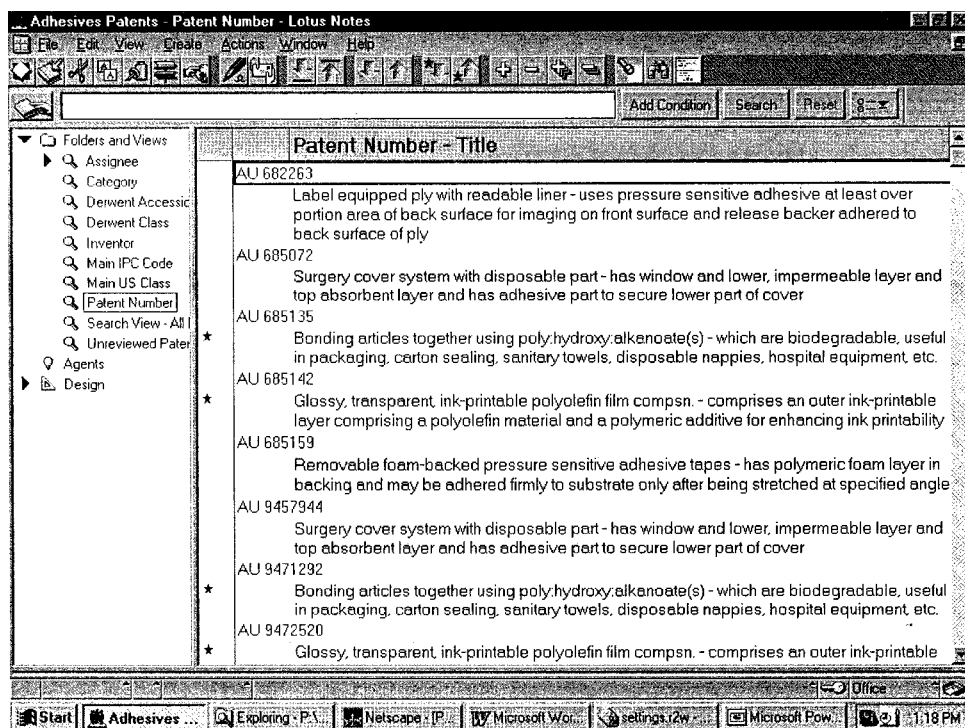


Figure 2. View by patent number.

tion. If a Derwent record is not available, another on-line patent source such as IFI/Claims is used. In this case 3M uses Data Junction conversion software to convert the data from on-line format into Lotus Notes format.

#### EXAMPLE OF A LOTUS NOTES PATENTS DATABASE

On opening, Lotus Notes displays the user's workspace (Figure 1). Each icon represents a link to a database on either the PC's hard drive, called a local database, or on the server. In Notes, double-clicking opens databases or documents and Escape closes them, making it easy to navigate. Figure 2 shows an open database. On the left side are Views, which are used to sort the data. Clicking on a View sorts the data according to the field(s) on which the View is based. The right side of the screen shows the patent records in the database. These Views were created on the basis of basic bibliographic information and indexing. The assignee and inventor Views are built such that the record will show up under each assignee or inventor if there are multiple entries. For the patent number View, each patent family shows in the View, allowing a quick search to be carried out for a particular number in the database.

Derwent records in the database contain bibliographic information, abstracts, and indexing (Figure 3). The data remains parsed into fields, which is important for two reasons. The first is that Views are built on fields and can be created on any field in the record. Having the patent family section, for example, made up of multiple fields rather than one unit of information makes it easier to create a View based on any of the pieces of information. Second, having the data broken into fields means the record can be rearranged to suit the user's preferences.

Lotus Notes allows the creation of links to documents, Views, or databases. In the patent family section of the Derwent record (Figure 3) a link is shown to any corre-

sponding Micropatent records in the database. Clicking on the link opens up the record. A similar link in the Micropatent record leads to the Derwent record. Thus, by whatever method users find a document, whether through Views, browsing, or searching, they are led to any other available information on that patent in the database.

The Micropatent records contain the full text of US patents (Figure 4, document only partially shown) and, at this time, front page text only for EP and PCTs. Again, the data is parsed into fields, allowing for easy View creation as well as rearranging of the data. At the top of the document is an icon that links to the image of the patent. Images are in pdf format, so double-clicking launches Acrobat reader to display the full patent image (Figure 5). Printing of the image results in a high-quality copy providing a source for document delivery. The capability to see graphics is particularly important in areas where the drawing or chemistry gives a much clearer understanding of the invention than simply a description.

This database contains an extra field that was added for categorizing the patents. During the initial evaluation users can apply one or more words or phrases to describe the invention as it relates to them. The top of Figure 3 shows that the terms "orthodontics" and "organosilane" were added. There is a Category View that sorts the records by these terms, allowing users to go directly to a subset of data of interest. The category terms are also searchable. The reviewers are cautioned about spending too much time on applying keywords. It can be very time consuming and discourage the reviewing of documents. We recommend that only one to two terms be added to the document and that the terms be ones that do not appear in the text or are 3M terminology. Above all, they should help the users find documents easily but not be considered comprehensive indexing. Some client groups have tried complex categorizing schemes and found them difficult to maintain. Applying category terms appears



Patent - Lotus Notes

Category:  
Orthodontics, Organosilane

**Controlling adhesive bond strength of orthodontic brackets - by priming with mixt. of adhesive-reactive and-unreactive organo:silane(s)**

Patent Assignee:  
UNITEK CORP (UNIT-)

Inventors:  
GILLE H K  
HORN S J

Patent Family:

Link	Crtry	Serial	Kind	Date	Week	Pages	Lang
	EP	296384	A	881228	8901	011	E
	BR	8803048	A	890110	8908	000	-
	JP	01022250	A	890125	8910	000	-
	US	4948366	A	900814	9035	000	-

Countries: AT, BE, CH, DE, ES, FR, GB, GR, IT, LI, NL, SE,

Local Applications:

Related No	Serial	Date	Type	Flag	Descriptor
1	88EP-0108714	880531	A	A	-
3	88JP-0155130	880624	A	A	-
4	89US-0390426	890803	A	A	-

Priorities:

Country	Serial	Date	Type
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Figure 3. Derwent patent record.

US 4948366: MicroPatent Full Text - Lotus Notes

MicroPatent Patent Information Database [View Patent Image](#)

Patent #: US 4948366 Issue Date: 08/14/90

Title: Adhesive bond strength control for orthodontic brackets

Abstract:

Ceramic orthodontic brackets are bonded to teeth with dental adhesive. Each bracket has a silica-containing layer on the tooth facing base of the bracket. A silanation layer is also applied to the base. The silanation layer is deposited from a solution containing a first silane coupling agent reactive with organic resin in the adhesive and a second silane coupling agent having a non-reactive organic group. Collectively the silanes occupy all of the silanation sites on the silica-containing substrate. By controlling the ratio of reactive and non-reactive silane coupling agents, the bond strength between the substrate and the adhesive can be controlled. A set of ceramic orthodontic brackets can have uniform force of removal by varying the proportions of silane coupling agents on the brackets.

Inventor: Jerold S. Horn, Azusa, CA  
Henrick K. Gille, Monrovia, CA

Assignee: Unitek Corporation, Monrovia, CA

Application #: 390426 (Series 7) Filing Date: 08/03/89

Related U.S. Applications: This is a continuation division of application Ser. No. 67 243 filed June 26 1987 now abandoned.

Government Interest:

20 unread document(s) remaining

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Figure 4. Micropatent full text patent document.

to work best when there are 5–10 established terms to choose from.

As mentioned earlier, it is important that raw data added into these databases is evaluated, ensuring the database remains focused and relevant. When new records are added to the database they are first placed in an "Unreviewed Patents" View (Figure 6). There they are reviewed by the editor, the person who requested the search. Often, however, there are multiple editors for a database, particularly where there is more than one current awareness profile updating

the database. In this case the documents are grouped under the individual editors' names. Upon opening the first document, action buttons make it easy to go through the list of hits (Figure 7). If the record is not wanted it can be deleted; otherwise a Category can be applied, "Yes" selected for Reviewed, and "Save and Next Document" clicked. Once a document has been marked "Yes" for Reviewed it is removed from the Unreviewed Patents View and appears in the other Views such as Assignee and Patent Number. The search View shows both unreviewed and reviewed docu-

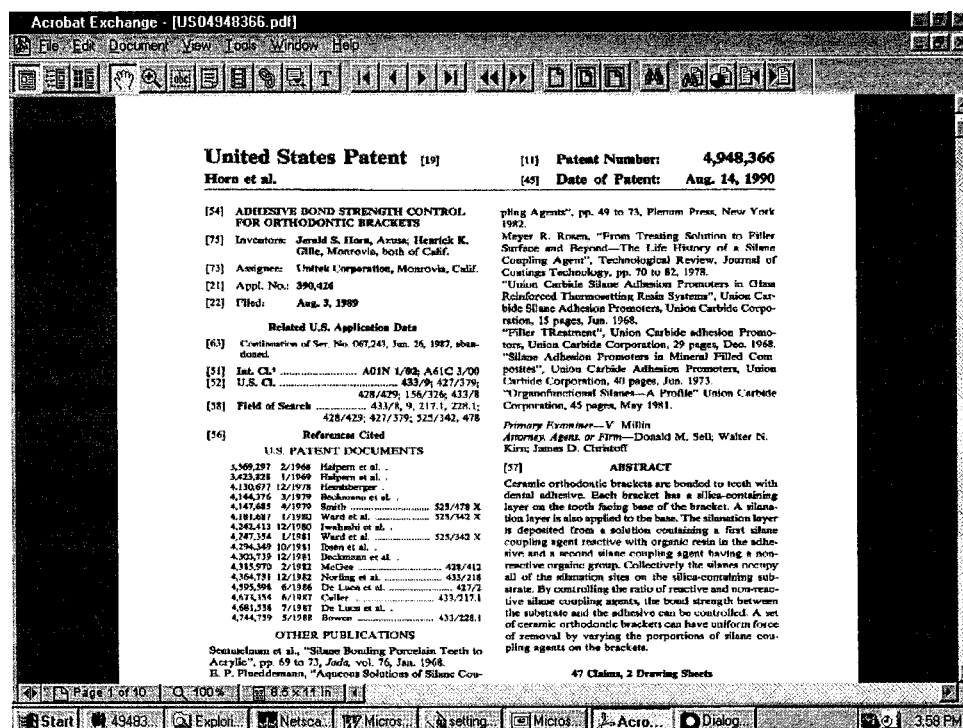


Figure 5. Micropatent patent image.

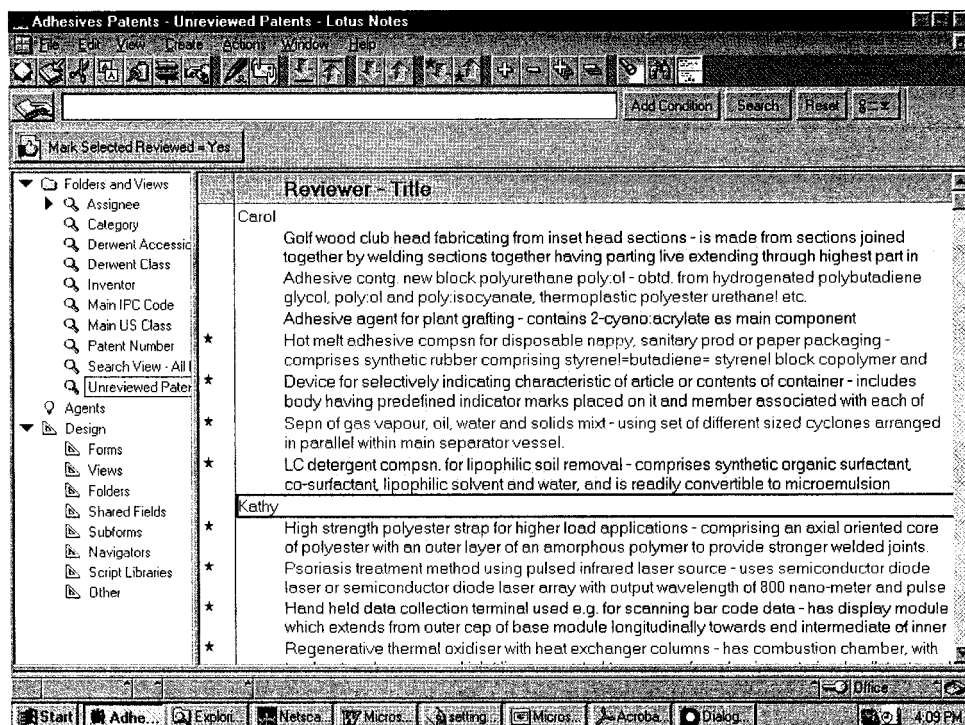


Figure 6. Unreviewed patents view.

ments to allow searching of the complete database. Unreviewed records are kept separate to aid Reviewers but are accessible to all users.

The main method of searching Lotus Notes databases uses the search bar (Figure 8). One or more keywords may be entered and Boolean logic and truncation are allowed. Clicking on "Search" brings up matching documents in order of relevancy, this being determined by the number of hit terms in the document. The gray bar shows the degree of relevancy, with the darker end of the bar being more relevant.

When the documents are opened the search terms are highlighted. Searching by field is allowed with the "Add Condition" button.

The database design allows three levels at which the users can access the information. The first is to manage their current awareness. It provides an easier interface to sort and organize the information but is accessible by others and saved for future use. The next level is to see what other Reviewers have found in their area of interest by using the Category View. The third is to search the database either weekly as

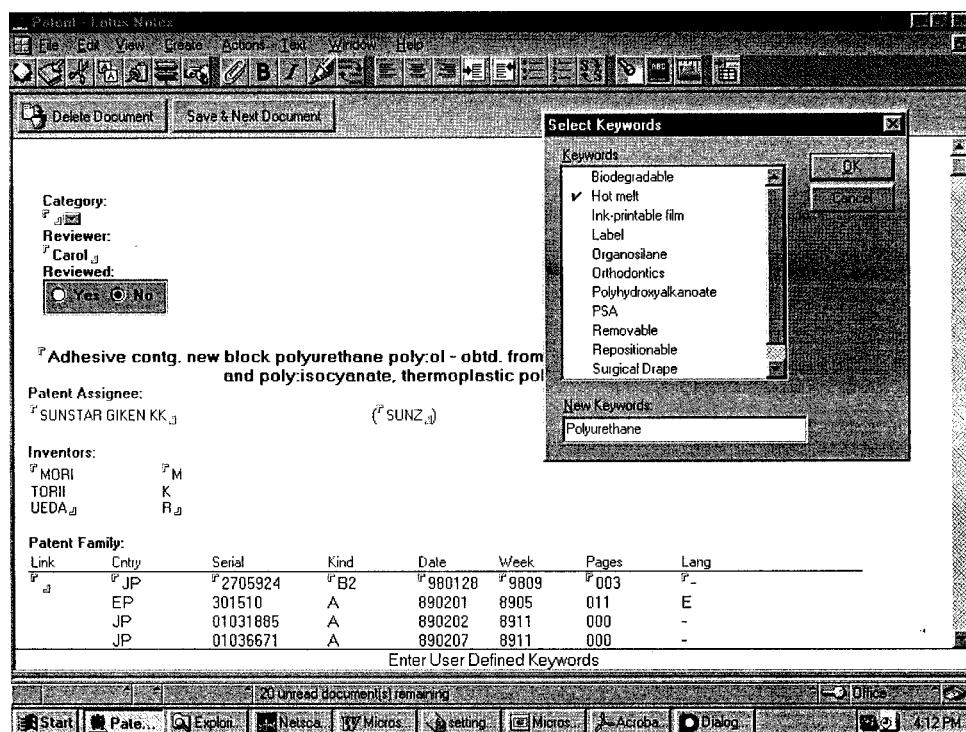


Figure 7. Action buttons for reviewing patents.

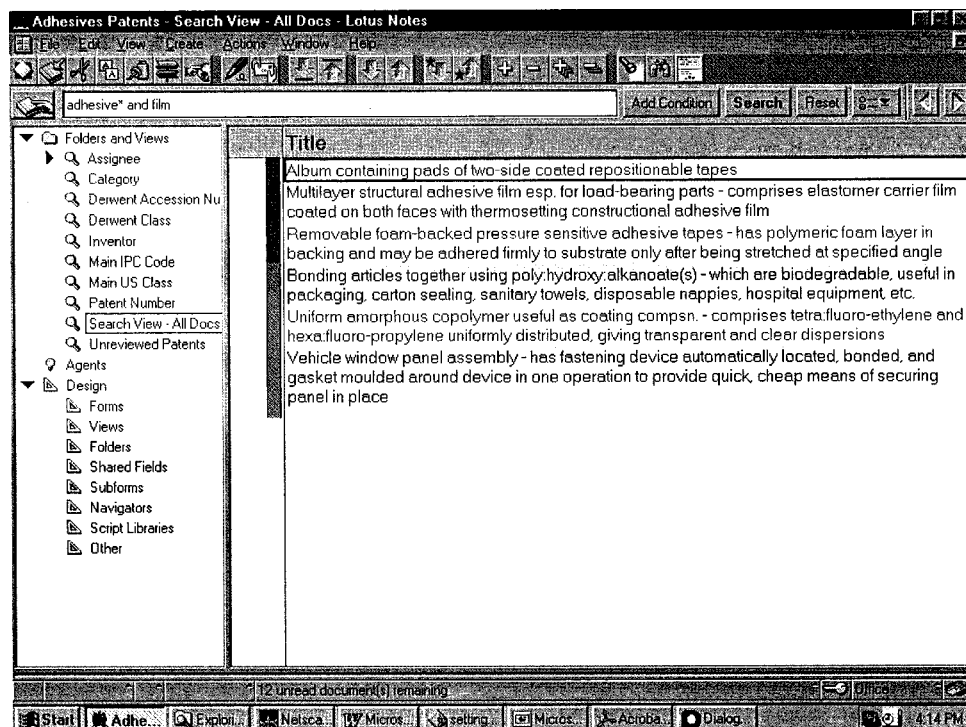


Figure 8. Searching patent records.

new data is added or periodically as a select set of prior art. By allowing for different levels of usage more researchers should feel encouraged to use the databases without being overwhelmed by information.

#### STEPS TO BUILDING A DATABASE

The researcher's file cabinet is often the starting point in building a database. For this initial collection, abstract and full-text records are obtained to be put into a database. A retrospective search is frequently conducted to add to the

collection. Finally, a current awareness profile is constructed to keep the database up to date. If the database is for a work group or team, ideally the areas of interest will be divided so that each member is responsible for covering a specific area without duplicating the information.

#### FUTURE PLANS

The current system for inputting data is very labor intensive. Programming is currently being written to automate the process wherever possible. The first step involves



ordering Micropatent documents. Once a Derwent record has been reviewed for inclusion in the database, and it has a family member for which Micropatent can provide a document, the database will automatically place an electronic order for the full text and image. If the document already resides in a 3M database, a copy will be pasted into the ordering database. Otherwise, the request and resulting document are exchanged electronically with Micropatent. Replacing our current batch-ordering process will shorten the turnaround time from weeks to days.

At present a database may have multiple Derwent records with the same accession number because the same invention shows up each time an equivalent is issued. Programming will automatically merge records if an accession number appears in the Unreviewed Patents View that is already in the database. Fields will be updated and any categories that have been applied will be kept. The Reviewers will not see it appear in their results, although the original record will be marked as modified so they will know it's been updated.

The database will also keep track of rejected patents. Once a document is rejected from the database by the reviewer, the Derwent accession number is added to a reject list. If this record appears again in either a current awareness search (due to an equivalent) or another retrospective search added to the database, it is automatically deleted. The hazard of this process is that the scope of the database may change either through additional new current awareness, a new reviewer, or a change in the researcher's interests, and documents may be deleted that are now of interest. In these cases, the reject list can be erased and reinitiated.

Overall, both the merging of records and use of the reject list will greatly reduce the number of hits the researcher has to review each week, leaving more time for understanding the data than managing it.

#### SUMMARY

Lotus Notes allows for creation of highly relevant, focused databases, which is particularly important at 3M because of the diverse areas of research. These databases are updated regularly so the researcher has the most up-to-date information for making decisions. Views allow for a dynamic database assisting in information retrieval and analysis. With 3M's emphasis on teams, particularly cross-functional, interdivisional teams, the capability of sharing databases is critical.

It was originally envisioned that researchers would build and manage their patent databases. They would be given the database template and the tools to add data. With our increased knowledge of the capabilities of Notes, this role has now been centralized, with Information Services taking responsibility for creation and management of the databases. The researcher's job is solely knowing the art. Lotus Notes patents databases can make this a more manageable task leading to increased use and understanding of patent information followed by accelerated innovation.

#### REFERENCES AND NOTES

- (1) Londergan, S.; Freeland, P. *Lotus Notes for Dummies*; IDG Books Worldwide, Inc.: Foster City, CA, 1996; p 6.

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