An Expert System for Legal Consultation

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Abstract

This paper describes an expert system that was developed
to assist attorneys and paralegals in the closing process
for commercial real estate mortgage loans. The system
identifies the legal requirements for closing the loans by
considering the numerous individual features specific to each
particular loan. It was felt that an expert system could
provide significant benefits to this process, which is
extremely complex and involves large amounts of money. To
our knowledge, expert systems technology had not
previously been applied to this domain. Successful
development and implementation of the system resulted in
the realization of the anticipated benefits, and a few
others as well.

Introduction

Commercial real estate mortgage loans (i.e. loans secured
by income producing properties such as office buildings,
apartment complexes, shopping centers, and hotels)
are complex transactions. Metropolitan Life engages in
many such transactions a year and each transaction
represents a substantial loan amount (sometimes up to
nine figures). The loan closing process requires a
significant amount of legal expertise and consultation
during the commitment, documentation, and closing
phases.

While each transaction is unique, there is a general
pattern to what is required from a legal standpoint, and
prior transactions are used to create a framework for
handling the current transaction. This framework
building is time consuming and can result in an
incomplete end product because the uniqueness of the
current transaction precludes a perfect match with
a prior transaction. A senior attorney ultimately has
responsibility for the transaction, and usually has
assistance from a junior attorney and/or a paralegal. The
senior attorney's time is costly and valuable, and it is
desirable to minimize the time that he or she devotes to a
transaction.

An expert system was seen as a good way of providing
help in identifying, organizing, and documenting legal
requirements for commercial mortgage loan transactions.
The main goals were to:

- Reduce the amount of senior attorney time
  necessary to be devoted to the transaction and the
  time spent on referrals back and forth among the
  senior attorney, attorney, and paralegal. Any
  reduction in senior attorney time is extremely
  beneficial because it is so expensive and at a
  premium.

- Eliminate the need for extensive searches for
  precedent transactions and determining which are
  the most relevant to the current transaction. This
  would contribute to reducing the time of the entire
  loan process, which would be beneficial for the
  legal process as well as the investment process.

- Provide accuracy, appropriate consistency, and
  reliability to the process throughout Metropolitan's
  nationwide commercial mortgage loan operation. The
  legal process is performed in six real estate
  investment offices spread across the country.
  Invariably, some differences in the process occur
  because of individual approaches.

Although there would be some interpretation of the
law involved in establishing the knowledge base, the
expert system would concentrate more on applying the
established aspects of the legal process to the facts of
each case. It was considered that this factual focus would
provide the most benefit to the legal professionals at
Metropolitan. This planned use of computerized help in
Metropolitan's legal department was a significant
departure from existing computer use for the
department, which had previously been primarily of the
more traditional type (such as word processing and
time tracking).

The Solution

A team was formed of one knowledge engineer from Metropolitan's corporate Expert Systems Technologies unit and a senior attorney (Associate General Counsel) from Metropolitan's Law Department. The attorney specializes in real estate transactions, has an interest in computer applications, and has served as chairman of an American Bar Association committee on the use of computers as a legal assistant. The team was given the task of building a reasonably robust proof of concept expert system in three months. The proof of concept expert system would then be evaluated for acceptability and, if given a positive evaluation, would be expanded and distributed for use in all real estate legal offices of Metropolitan. This proof of concept task was successfully completed, and the evaluation resulted in a decision (by the people in charge of the Real Estate Investments section of the Law Department) to move forward with a production-level system.

In order to limit the project to a manageable scope and yet produce a practical working system, the problem domain was confined to the preparation of a detailed and comprehensive checklist. This checklist includes all the documents and other requirements to be satisfied in order to close the loan transaction based on the unique combination of facts presented by the transaction. The system considers various local, state, and federal laws and regulations as well as Metropolitan's practices and requirements. The initial effort was restricted to address just one type of property in one city, until a good understanding of the process was achieved by the knowledge engineer. The knowledge base was then expanded to deal with all property types and locations appropriate for Metropolitan's lending practices.

Most of the knowledge acquisition was conducted in person, mostly through interviews with the expert. However, because the knowledge engineer and the expert worked in different parts of the country, some knowledge acquisition was conducted by telephone and by mail. To accomplish this, as various checklist requirements and the transaction conditions they were contingent upon were identified, different methods of representing the knowledge were used to help review, expand, and define relationships. These included the use of pseudo-rules, lists of relevant facts and what requirements they affected, and lists of all requirements and which facts they were affected by.

Knowledge acquisition sessions for the proof of concept task were held over a period of eight weeks with an overlap during the latter part of this period for the start of the creation of the knowledge base. Knowledge acquisition continued over another six months to reach a production-level system. During this expansion period, the knowledge base was also enhanced to reflect regional requirements.

The PC version of a commercially available expert system shell was used to create the knowledge base. The shell's internal report generator proved very helpful in producing the printed checklist, which had to meet the extremely high standards appropriate to transactions of this nature (given the professionalism of the people and amount of money involved).

Another critical technical consideration concerned system memory. The system would be delivered on PC's with no more than 640 kilobytes of RAM. As the knowledge base quickly grew, the total memory requirements for DOS, the shell software, and the knowledge base soon approached 900 kilobytes. Thus, the knowledge base was designed to take advantage of the shell's provision to allow modular knowledge bases and its ability to move portions in and out of memory. This made it possible to deliver the system to run under the existing memory without any significant performance impact.

The initial (proof of concept) knowledge base consisted of 119 rules. When put into daily production, the knowledge base had been expanded to 322 rules. Nine months into production, the system contained 428 rules, 351 parameters, 57 messages (each message is a unique screen format used to display different types of screen output to the user during a consultation), and 47 states (states are the high level objects used to modularize the knowledge base; the system's rules, parameters, and messages are spread among the various states).

A Consultation with CLINT

A consultation with the system (named CLINT, for Checklist for Income Loan Transactions) begins by providing a brief introduction and overview of the system for inexperienced users (which can be skipped if the user wishes). CLINT operates by questioning the user, i.e., an attorney or paralegal, as to the various facts that must be known in order to identify the required documentation and closing conditions.

As an expert system, CLINT asks the questions that the senior attorney responsible for the transaction would be posing to insure that the appropriate requirements are incorporated properly. The number of questions that are asked for each transaction generally ranges between forty and seventy, based on the responses to various questions. Accordingly, the system will only pursue those lines of questioning and reasoning that are relevant to the transaction. Each user response results in (a) basic information that is necessary for the checklist that is displayed on the computer monitor and/or printed

output, and/or (b) a determination of certain documents or requirements that will appear in the checklist, and/or (c) additional questions to be posed to the user.

Examples of the types of factual information that the user is asked to provide are:

- The type of property for which the loan is being made. This is needed to identify such legal concerns as franchise and management agreements, types of leasing requirements, and title policy requirements.

- The city and state in which the property is located. The system takes into account state and local legal requirements, which help determine such factors as building and zoning codes, environmental restrictions, and available title policy endorsements.

- The stage of construction of the project. Whether construction has not yet begun, is in process, or has been completed will affect requirements such as agreements with construction lenders and the types of surveys.

- The organizational structure of the borrower, such as partnership, corporation, or land trust. This is important for determining the specific types of documentation necessary to evidence the borrower's authority to accept the loan and execute the loan documents, and in some states may be critical to determine whether the loan's interest rate is usurious.

- The type of interest that the borrower has in the mortgaged property, such as fee simple, leasehold, or beneficial interest in land trust. This helps determine, for example, types of coverage required by the title insurance policy and the requirements for various legal opinions to be obtained.

There are some questions for which the system allows "unknown" as an acceptable answer. However, these are relatively few, since most answers should be readily available and/or their omission would be too critical to allow. If an "unknown" answer is supplied by the user and accepted by the system, certain assumptions are made in determining the checklist requirements. Also, the output will include a list of all questions that were answered "unknown," accompanied by a warning that the appropriate answers must be obtained and the consultation rerun to provide an updated checklist before closing.

Many other factors are also considered, such as type of loan interest (fixed or variable), the interest rate, proximity of the property to an airport, size of the property, liens, escrow agreements, and easements. Each combination of facts results in a unique set of documents and requirements which would not likely be found in a checklist for any one prior transaction and would not likely be within the knowledge of a user without substantial experience.

The system was also designed to check for inconsistent, invalid, and questionable responses from the user. When obviously inconsistent or invalid answers are entered (e.g. amortization period is less than the loan term), the system warns the user and explains why the answers are not consistent or are invalid. The user is then given the choice of which responses to change, and detailed instructions on how to make the changes. (For these situations, the consultation is not allowed to continue until the necessary corrections are made.) CLINT also checks for questionable answers (e.g. an unusually high interest rate or borrower's fee) and situations inconsistent with Metropolitan's normal lending practices (for example, a leasehold mortgage loan where the ground lease expires less than twenty years beyond the end of the amortization period). In these cases, the user is warned of the possible consequences of the situation, and asked for corrected information or confirmation that what was entered is indeed correct. This is a very important aspect of the system from a training standpoint and helps to ensure correct input.

The output of the system, which is first displayed on the screen, is divided into several parts. First is a heading, which provides the basic transaction information such as loan amount and commitment expiration date. This is followed by any appropriate warnings (for example, if any questionable answers were provided during the consultation and not changed when flagged by the system, the checklist will contain strongly worded cautions about possible adverse legal and/or business consequences of the transaction).

The next section of the output contains the checklist items themselves. This section specifies the individual requirements which must be met before closing on the loan, based on the information provided during the consultation (and, in addition, includes those items which are universally appropriate and relevant to all cases). For ease of reference, this section is subdivided into six groups of requirements as follows:

- *Loan Documents,* which specifies the basic loan documents needed, such as promissory note, mortgage, tenant estoppel certificates, security agreements, assignments of rents and leases, UCC financing statement, FIRPTA affidavit, and guaranty of loan documents.

- *Title and Survey Requirements,* which includes such items as title report and policy; zoning endorsements;

survey of land; UCC search; as-built survey; appurtenant easement agreements; covenants, conditions, and restrictions; and considerations relating to flood zones and access to the mortgaged property.

- *Authority to Execute Documents,* which specifies the requirements to evidence the authority of the various parties to the loan (such as Metropolitan, borrower, and guarantor) to enter into the transaction and execute the appropriate documents.

- *Legal Opinions,* which covers the required opinions of various attorneys such as Metropolitan's local counsel, borrower's counsel, and guarantor's counsel. These opinions deal with many areas, including (a) validity, enforceability, and due execution of the loan documents and (b) priority of liens and security interests.

- *Architectural Matters,* which includes items like approval of the plans and specifications by Metropolitan's architect, certificates from the borrower's architect, zoning permits, and certificates of occupancy.

- *Other Requirements,* where anything not covered in the other five categories is included. This runs the gamut from checking usury laws, ERISA restrictions, relationship disclaimers and tax assessments to hazard insurance, finish and commission escrows, rent rolls, leases, and assignments of agreements.

Next, the user is reminded to review the output closely to confirm that the requirements look correct and reasonable. If not, the system gives detailed instructions on how to change any information provided during the consultation (if the error was caused by incorrect input) or report any apparent inaccuracies in the output.

A reminder to store the consultation (to disk) is then given, with step by step instructions on how to do so. Most consultations will be stored under the submission number or property name, and the user's initials. The stored file provides a permanent record of the consultation for reference and auditing purposes. It also allows the consultation to be rerun at a later date, when updated information can be provided without having to re-enter all information.

After storing the consultation, the user is given the option of obtaining a hardcopy output in the form of a printed checklist. (Except for rare cases, this option would be exercised.) The printout is very similar to the screen output, with the basic difference being that it lists the requirements in columnar format. The first column shows each requirement, the second column has

a sign-off space to document when each requirement has been met, and the third column provides the opportunity for indicating that some requirements have been waived. (Note: Because some requirements are so important that they can never be waived, the third column would indicate "NOT WAIVABLE" for them, and not provide a sign-off space for waiving.) An enhancement to the system will produce an alternate version of the printout, which will be provided to the borrower. This alternate version will not indicate which items are waivable, nor will it include any of the warnings, so that Metropolitan does not disclose its negotiating position to the borrower.

Next, if the user was not previously known to the system (CLINT checks during the consultation), he or she is asked if they should be added to the list of known users. If so, a memorandum is printed containing the user's name, title, and other appropriate information. It's addressed (by the system) to the appropriate authority, and if signed by the Associate General Counsel in charge of the office (CLINT plugs in the appropriate signature block), the name will be added to the system.

Last, the system provides the option of printing a list of all questions and answers from the consultation. This can be added to the loan file for additional future reference if desired.

Conclusions

CLINT was developed at a total cost of less than $75,000 (including the expert's time, the knowledge engineer's time, software for each office using the system, and travel expenses) and has been in use since April, 1988. Because the system was designed to provide extensive automated help, successful introduction into use was accomplished in less than a day per office. The staff in each office was split into small groups to encourage an interactive training session, and each group was trained in a couple of hours. This included not only actual training to use the system, but also discussions on the rationale behind the conclusions reached by CLINT in formulating the checklist. The system is currently running in three of the six Metropolitan real estate law offices and will be in use in the remaining three offices shortly.

The on-line help facilities consist of prompts and explanatory material that guide a user through the process of using the expert system for a consultation, saving a consultation, changing a consultation, and printing a checklist. This on-line help (which, while always readily available, is unobtrusive to more experienced users) was seen as a key requirement to having the the attorneys and paralegals quickly adapt to a new technology. Although printed documentation for

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using the system was provided, it was more for background information and has not been needed to use the system (even for inexperienced users, including some who never before used a computer). To date, there have been very few questions and very few usage problems, all of which were easily and quickly resolved.

Since installation as a production system, there have been three enhancement releases. Assimilation of all three releases has gone very smoothly using an "install" batch file to guide users through the installation.

CLINT assists the less experienced attorney and paralegal by preparing a list of all documents and other requirements for a specific commercial real estate mortgage loan transaction. The list is very detailed and comprehensive and could be as long as fifteen pages. Many of these requirements would not be known by a person without substantial experience. However, the system is only an advisor—ultimately, the attorney who is responsible for the transaction has to be responsible for all the requirements in the checklist. Great care was taken in acquiring the knowledge for CLINT, and one of the advantages of the system is the ease of updating it. It can be improved and enhanced any time a lawyer or paralegal comes up with an additional requirement that does not appear on a checklist and which the expert concurs ought to be added to the system. The expert will then advise the knowledge engineer of the new requirement and the conditions under which it should appear on a checklist.

The expert system is providing the following benefits:

- Time savings in the form of faster identification of the legal requirements. The magnitude is minutes versus days.

- Allows the checklist to be done much earlier in the overall loan transaction process. This means that the work necessary to satisfy the various loan requirements can begin sooner, and in many cases should enable Metropolitan to close loans at an earlier date.

- The ability of the system to save consultations has made the process of modifying a checklist because of an investment-dictated change much easier.

- Company-wide accuracy and consistency in the identification of the legal requirements. As the process is handled in several dispersed offices, the system provides a common thread among the offices, while at the same time allowing for some differences relevant to the specific geographic regions of the country.

- Allows senior attorneys to minimize their time on this requirement establishing phase of the transaction.

- Permits the creation of a checklist to be performed by those too inexperienced to have produced it before. The system identifies the more esoteric aspects of a case which formerly may not have been ascertainable to them. And, of course, this enhances the training of new attorneys and paralegals.

- Use of the system by an inexperienced lawyer or paralegal has training implications beyond the specific transaction being worked on in that it helps broaden their knowledge of all commercial mortgage loans.

- Allows for more timely and uniform response to business policy and statutory changes. A change can be introduced into the system and be in consistent use in all offices in a very short period of time.

The Future

CLINT has been so well accepted that consideration is being given to expanding the system to provide assistance during the commitment phase. The commitment takes place during the earlier phases of the loan process, and is an agreement entered into between Metropolitan and the borrower, whereby Metropolitan agrees to make a specified loan under certain conditions. Since CLINT identifies all the requirements for making the loan, it can also be used to check on the adequacy of the commitment to make certain that necessary or desirable conditions are not omitted. The system may also eventually be expanded to prepare initial drafts of the commitment and other loan documents.

Additionally, consideration is being given to expanding the system to handle farm and ranch mortgage loans.

Finally, consideration is being given to making CLINT available outside of Metropolitan. The checklist process is basically generic to all commercial real estate mortgage loans, and is performed by a multitude of organizations, including law firms which provide contracted services to Metropolitan and other lenders, as well as other lenders themselves (including banks and insurance companies).

To summarize CLINT's future, we envision it being used for other parts of the commercial real estate mortgage loan process, for other types of loans within Metropolitan, and possibly by other organizations.