THE COMPUTER AND LEGAL INFORMATION RETRIEVAL

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In this article the author gives a short introduction into the basic elements which are involved in the computer process. He then deals with the problems involved in adapting both statute law and case law to these devices and concludes with a brief résumé of the current research projects being carried on in this field in Canada. The author believes that the computer will be a necessary element in the conduct of legal affairs in the near future.

To appreciate fully the impact the computer can have and is already having on the law, it is necessary to know a few basic things about the computer itself. The writer has decided, therefore, to begin this article with a brief look at the computer and how it operates.

I. INTRODUCTION TO THE COMPUTER

Computerized data processing follows, in general, the same procedure as any data processing system. Regardless of the data to be processed or the equipment to be employed, there are three basic stages in a data processing system: input of source data, processing of such data by means of a specific procedure, and output of results. As an example, we might compare a computerized accounting system with a manual card index system operated by a clerk.

If the clerk wishes to obtain the balance of a client's account he may have to locate several cards which contain figures, write these figures down, perform the necessary addition and substraction and then write out the result if it is to be passed on to someone else. If the computer were required to perform the same operation, it would have to be able to locate the necessary data, read it into the system by means of an input device, manipulate it, and then write it out on some output device.

For the clerk to perform this function, he must know how and where to locate the appropriate data, what processing has to be done and how and where to write out the result. Likewise, the computer must be given the same information. In the clerk's case, this is part of his training, whereas in the case of the computer, it must be given specific instructions on each

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occasion it has to perform such a task. The instructions it requires are given to it in what is called a "programme."

The main difference between the clerk and the computer is that although the clerk can use his own initiative and deviate from the procedure he has been taught if circumstances warrant it, the computer has no such ability. It will perform faithfully the procedures laid down for it but unless provision has been made for it to take account of unusual circumstances it will press on regardless.

A programme, therefore, must contain every step to be taken by the computer to perform the required task. In addition, every possible situation which may occur in the processing must be anticipated by the programmer and an alternative path given to the computer if one becomes impossible. Failure to do this may cause the computer to enter what is referred to as a "loop" in which case it will continue to perform over and over again a set of routines being unable to leave this "loop" as no exit has been provided. Alternatively it may avoid "looping" but find it is unable to locate the next step and ends the execution of the job.

Programmes are referred to as "software." This is in contrast to "hardware," a term used to refer to the computer itself and its peripheral equipment. This is the basic division in the computer world. Sufficient has been said about "software," so we will now move on to consider the more important items of hardware.

II. HARDWARE

Hardware can be divided into three general categories; [1] consisting firstly of a central processing unit, secondly, storage devices including core storage and secondary storage, and thirdly, communication and other types of input and output devices.

1. *Central Processing Unit*

All that need be said here about the central processing unit is that it performs functions such as addition, subtraction, shifting, moving, comparing and is the control centre for the operation of the whole computer system.

2. *Storage*

There are two types of storage, core storage and what is sometimes referred to as auxiliary or secondary storage.

(a) core storage

All data must be put into core storage before it can be processed by

[1] See diagram *infra* at 438. There are other types of hardware but we need not concern ourselves with them here.

the computer. It is read in by means of an input device from a secondary storage device.

The size of the core storage determines the amount of information which can be held within the system at one time. Storage capacity is usually measured in "bytes," a "byte" representing one character, *e.g.*, one letter of the alphabet. Core storage capacity may vary from thousands to millions of bytes and affects the way an operation is performed.

(b) secondary storage

Secondary storage is a very important part of any information retrieval system and is particularly important in the legal area where large volumes of data are involved. The usual way data is stored is on either what is called a direct access device or on magnetic tape. In addition, one can include in secondary storage any method of data storage which can be read by an input device for the computer. This will then also bring in such things as punched paper tape, punched cards, and documents that can be read by an optical character reader.

For the majority of work in the legal area, data is stored on either a direct access device or on magnetic tape, the other devices mentioned being employed only for the initial creation of data.[2]

The distinction between a direct access device, such as a magnetic disk, and magnetic tape is of particular importance in the information retrieval field. The great advantage of a magnetic disk over a magnetic tape is that data on a tape can only be retrieved sequentially, whereas data on a disk may be retrieved both in sequence and at random. Thus, when using magnetic tape the search must start at the beginning of the tape and move sequentially through until the appropriate information is found. With a magnetic disk, it is possible to go immediately to the spot where the relevant data is located.

This search method is of particular value when the computer is required to locate a specific word or words in an alphabetic index of words.[3]

Why, therefore, are magnetic tapes used at all? There are several reasons, the majority being economic ones. A 2,400 foot magnetic tape is relatively inexpensive and can hold up to 24,000,000 bytes of data.[4] It is readily loaded onto a tape drive and is very convenient for shipping. Magnetic disks vary in size but even a relatively small disk pack holding ap-

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[2] With regard to various techniques for data creation see Skelly, *Computerization of Canadian Statute Law*, 1 L. & COMPT. TECH. 10 (Feb. 1968), and Skelly, *Computers and the Law*, 33 SASK. L. REV. 167 (1968).

[3] See *infra* at 444.

[4] The density of data on a tape is measured in bytes per inch (b.p.i.). The figure of 24,000,000 bytes is calculated on the basis of 800 b.p.i. which is a fairly standard density. A density of 1,600 b.p.i. is possible and is becoming more readily available. Because of other factors this will not, as might be thought, double the volume of data which can be stored on a tape, but will nevertheless increase it considerably.

proximately 7,000,000 bytes is considerably more expensive than a tape and loading is a slower process. Also, disk drives are less readily available for this kind of use, being in demand for other purposes. A disk drive, however, may be specifically dedicated to the particular job, but that is very expensive. Disks of capacity comparable to the 2,400 foot magnetic tapes can be obtained but they are even more expensive.

Thus it is important to make the most economic utilization of the two types of storage.

3. *Input and Output Devices—(1/0 Devices)*

Input and output devices may be divided for our purpose in two types. The first type would include those which are used as communication media between the computer and the user. Devices which input stored data and output data to be stored may be included in the other type.

(a) communications type

The basic input device in any computer centre is its card reader which will read as many of 1,000, 80-character cards a minute. The basic output device is the line printer which will print out a line of up to 132 characters at speeds as high as 1,100 lines a minute. At present, they provide the basic communications link between the user and the computer. However, the card reader has the disadvantage that it is necessary in the first place to punch a card for it to read. They both suffer from the fact that they are essentially local devices. It is not particularly feasible to move them far from their computer environment.

This fact, together with the increasing need to communicate with the computer in a conversational[5] mode, led to the development of cathode ray tube (C.R.T.) display units and telecommunications (typewriter) terminals. The C.R.T. display unit is equipped with a keyboard, making it possible to use either device to communicate with the computer simply by typing on the keyboard. These devices can be operated in close proximity to the computer or at a remote location, an important factor in any information retrieval system.

However, these devices too have their shortcomings. The typewriter terminal is particularly slow as an output device operating at approximately 14.7 characters a second. The cathode ray tube is somewhat faster as it will accept data at a rate of 120-240 characters a second over ordinary telephone lines and can display a whole screen of information at one time. As input devices, they are slow, both being tied to typing speed and line transmission rate.

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[5] "Conversational" describes the interaction of dialogue which takes place between a user and a time sharing system, via a terminal device, whereby the user is able to control, interrogate, modify, and observe the processing of his task.

(b) other type

The other type of input-output device does not act as a communications medium in the same way, but reads data which is stored in machine-readable form into the computer and perhaps after processing, outputs it, again in machine readable form. The most commonly encountered devices of this type are magnetic tape drives and magnetic disk drives. Data can be read from or written on a magnetic tape or disk at a rate of up to 300,000 characters a second.

III. Applications to the Legal Area

In the discussion of data processing systems earlier we saw that all such systems can be divided into three parts: input of source data, processing and output of results.

There are two main types of data processing involved in the legal field. A client may approach a lawyer with a problem which involves purely an information retrieval process. He may be interested in buying a house, requiring a search at the land titles registry, or purchasing some chattel, requiring a search for possible encumbrances upon that object.

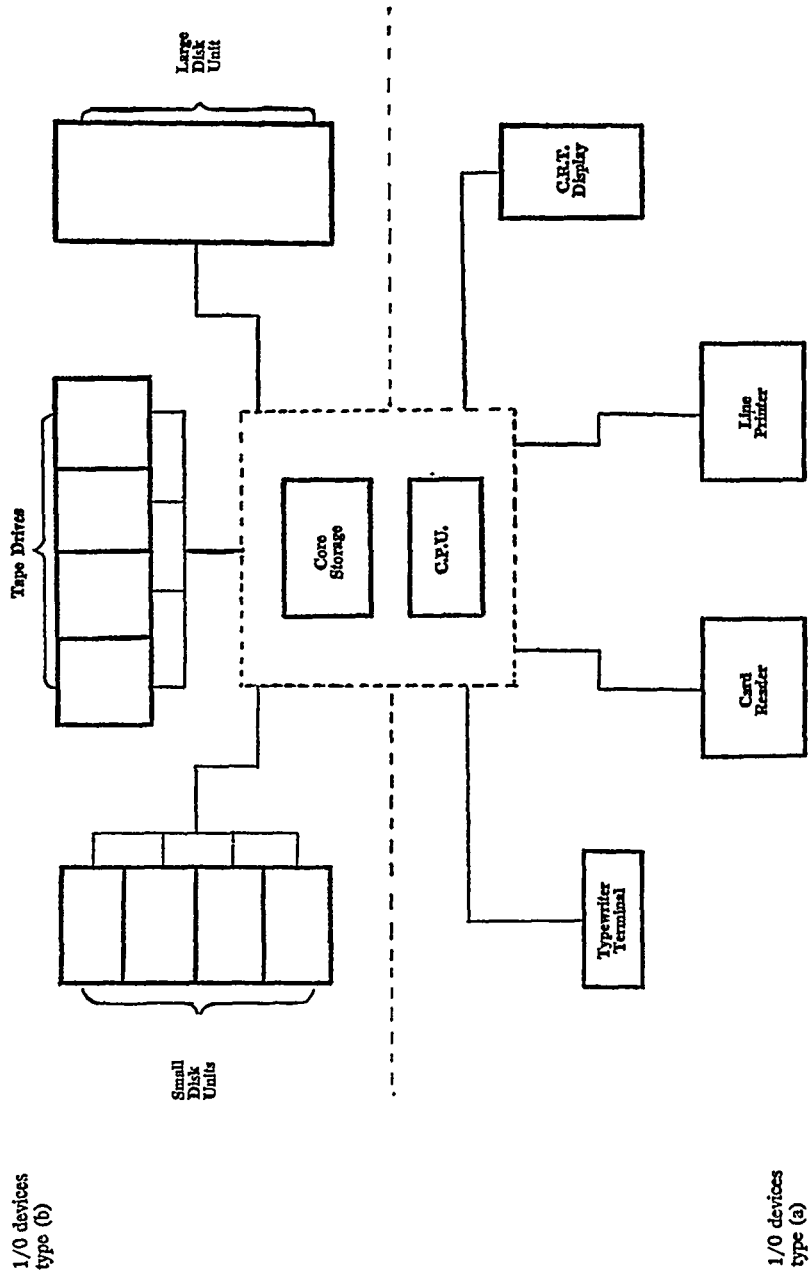
On the other hand, a client may, for example, be concerned with his position with regard to pending legal proceedings. Here, two different types of data processing are involved. The lawyer must first perform an information retrieval process to collect the relevant statutory provisions, regulations, and cases. The output from this process is then passed to the next data processing stage, the evaluation of the client's position in the light of this information. The output from this stage is the decision on the client's position.

It is difficult at present for the computer to provide much practical assistance in the second of these two processes since this is what the lawyer spends his years in law school, his period of articling and the rest of his practising life learning to do. However, a part of a lawyer's training is to enable him to retrieve the information he needs in order to come to a conclusion concerning the problem at hand. Often, such a search does not require so much an intimate knowledge of the law but more a knowledge of the particular way subject matter is indexed or digests are set up, in other words, where he must go to find the information he needs. Here the computer can help.

Two things affect the efficiency of the computer in this kind of operation: one is the type of search technique employed and the other is the type of inquiry that is to be made.

The technique at present employed in computer information retrieval is essentially a comparative one. The computer scans the appropriate data in its data bank and compares it with the inquiry it has received. When it finds a match which is either identical or within limits that have been set, it

SIMPLIFIED DIAGRAM OF MODEL COMPUTER INSTALLATION



will indicate to the user the information it has found. Such a system restricts the type of inquiry which can be made. Where the inquiry is specific then the results of a search should be 100 percent accurate. However, such accuracy is difficult where the person who is making the inquiry is less able to be specific.

The majority of work in the computer-law field is at present directed towards the improvement of accuracy within the existing types of retrieval techniques. Although this is quite satisfactory in some areas of law, in others, the long-term answer is to adopt a more sophisticated retrieval technique. Work on the latter lines is underway, but it is unlikely that significant results will be produced for a number of years.[6]

In some areas as mentioned, the existing comparative search technique is quite satisfactory for this type of application. The need at present is to make the data more specific. Two areas in which this applies are retrieval from registers of property interests both real and personal.

1. *Real Property*

This discussion assumes the existence of some system of land title registration similar to the Torrens system. The details of each certificate of title would be stored as a separate record on either magnetic tape or a direct access device. The record might be divided into two parts: the "reference" area and the "information" area. The latter would contain details of encumbrances. The first "n" bytes of the former would be set aside for a unique number which would correspond to the certificate number.[7] The next "n" bytes might contain, where it existed, a unique number by which the property in question was identified on a plan of the province.[8] This might be followed by a defined area set aside for the street address and finally an area set aside for the name(s) of the owner(s),[9] the way the land is held and the legal description of the property.

By setting up the record in defined areas or "fields," as they are referred to in computer terms, it is then possible to search by specific fields. The computer could be instructed to go through a large volume of records looking for a specific number in the first or second field only.

Ideally, the person making the inquiry would know either the equivalent of the certificate number or a plan number. In such case the computer

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[6] This area of research is usually referred to as "Natural Language Processing." See REPORT OF THE PROCEEDINGS OF THE JOINT MEETING OF THE CANADIAN LINGUISTICS ASSOCIATION AND THE COMPUTER SCIENCE ASSOCIATION (June 1968) at the meeting of the Learned Societies of Canada at Calgary.

[7] The value of "n" would depend upon the number of possible titles which could arise. One byte is equal to one character.

[8] Ideally, the certificate number and the plan number would be the same in which case the second "n" bytes need not be reserved in this way.

[9] This information could be recorded in either part of the record *e.g.*, the reference part or the information part. If it were included in the reference part it could be used to identify a piece of property, meaning that it would be possible to ask the computer to locate all land owned by party "x."

could locate extremely rapidly and accurately the title in question. However, with regard to the street address and the legal description, such exactness is often not possible. The choice open is between the one extreme which requires that an exact similarity between the inquiry and the data be obtained before a valid retrieval could be made and the other where a retrieval is accepted as valid if a certain number of similarities are found. The latter approach is considered the more practicable by the writer, on the basis that a prudent user who selects fairly unique features of which he has knowledge will receive back a reasonable volume of information and from this can select the actual title he is interested in.

Example: The legal description of a piece of property might read:

> In the Town of Transnoca, in the Province Manitario, being the most Westerly fifty feet in width of Lot Twenty-three in Block Six which is shown on a plan of survey of part of the North West quarter of Section 6-12-3 East, registered in the Central Land Titles Office as No. 18634.

An inquiry phrased: 18634—Block Six—Lot Twenty-three would retrieve details of the particular property, plus all other titles to property in Lot Twenty-three, which will probably be few in number. On the other hand if the person making the inquiry had, in addition, known it was the "Westerly Fifty Feet" he would have had a unique reference.

The basic problem in the case of real property is one of identifying, on the face of the earth, the particular piece of land in which we are interested. When this can be done simply and accurately then the computer can easily locate the appropriate title information. [10]

The person making the inquiry could be given the option either of having the whole of the record produced by the computer immediately for him, or of having only the reference part displayed and later, when he was sure he had located the right piece of property, he could have the second part displayed which would include details of encumbrances. He might take the former course where he had an accurate unique reference. The latter would be used where he was unable to provide unique information about the property in question and his search would turn up more than the title he was looking for.

If the user required more information than that recorded in the computer data bank, for example, in connection with a mortgage, the computer could refer him to a specific location in a microfilm file where a copy of the mortgage certificate itself was filed.

Although microfilm is extremely useful and even preferable for any document which it is desired to store and retrieve in its exact form, [11] com-

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[10] Research is being carried out on the use of co-ordinates to identify pieces of land. If this approach was developed, it would simplify the situation considerably.

[11] This would become of importance where the validity of signatures is in question.

puter storage is far better where a great deal of retrieval work is involved, where data has to be frequently updated and where information is required at remote locations.

Inquiries could be made at the land titles office by means of a typewriter terminal or cathode ray tube display or even from the searcher's office if he had the appropriate telecommunications device.[12] Information would be displayed by such devices, or, where considerable volume was involved, the information provided by the computer could be printed at the computer centre by a high speed line printer.

With regard to the creation of data files and their updating, this would only be possible from specially designated terminals located in the central land titles office or in regional offices. These would be connected to the computer by a telecommunications link so that creation and updating of records could be done on a cathode ray tube by means of a keyboard or on a typewriter terminal. The former is preferable for updating for it is possible to display on the screen the record as it then exists, make alterations to the contents of the screen without affecting the stored record and then, when satisfied that the correct changes have been made, enter the screen contents and thereby update the stored record.

2. *Personal Property Interests*

The two main types of inquiry likely in connection with personal property interests are with regard to whether there are encumbrances on a specific chattel or whether the goods in general of a party have any encumbrances on them.

The first step in creating a computer system which could answer such inquiries would be to get the appropriate data into machine readable form and into the most convenient format for searches in relation to the two fields outlined above. The simplest approach to this would be to set up a file with a separate record for each owner. The record could be divided into two parts. The first containing information about the owner and the second, details of all chattels belonging to him which had encumbrances registered against them.[13]

If a user wished to carry out a search on a particular person, the computer would limit its search to the first part of each record. If he wished to search for a specific chattel, it would search only the second part. In either case, the searcher could have the first, second, or both parts printed out or displayed.

The greatest problem here again is providing sufficient information to

[12] The ordinary TWX terminals are suitable for this purpose.

[13] Against each chattel would appear the number of the chattel mortgage document, conditional sales document and so on which applied to it. This would make it possible to locate all chattels affected by such documents simply by giving the computer the document numbers to look for.

identify the person or chattel in question. This is likely to be more difficult in the former case where it is desired to locate information on a person. Probably, the only singularly unique feature about a person which is readily available is his social insurance number. This cannot however, be used in this context for two main reasons. One is that not everyone has a social insurance number (*e.g.*, married women who have not worked since its introduction) and secondly people are very sensitive about numbers being used in this way.

Although it might seem at first sight that a person's name should be unique enough reference for him, it is soon found that this is not the case. In addition, the searcher may not know the given names of the person he is concerned with, [14] he may not spell his name correctly or have the wrong given names. If the information provided by the searcher could relate to a number of people, that is, it does not uniquely identify the person he is concerned with, a choice must be made as to whether to provide no information at all for him in such a situation or to provide information on all likely people from which he can locate the one he is concerned with. The latter is again considered the more practicable course.

Where a name is spelt incorrectly by the searcher or wrong initials are used, the computer could be programmed to make some allowances for it, but the greater the allowance, the larger, of course, will be the volume of irrelevant information that may be retrieved.

Ideally, the system would be able to provide information on a national as well as a provincial basis. This could easily be accomplished if all provinces observed a uniform approach to data formatting. If the same data format was used in all parts of Canada, then a national retrieval system could easily be established, its data bank being created from data passed to it by the provincial data banks. It would then be possible, by the use of telecommunications equipment either to dial in to a local provincial data bank to obtain information with regard to encumbrances registered within the province, or dial in to another provincial system for information on encumbrances in that province or, if it were desired, dial into the national system for information on persons or chattels anywhere in Canada. This kind of facility is essential to the fast moving world of today.

The discussion up until now has been concerned with the type of information which although being of great importance to a large proportion of lawyers in their everyday work, yet is only peripheral to the law itself.

We will now consider how the computer may be used to retrieve information from the two major sources of law: statutes and judicial decisions. These again have their own particular problems in relation to computer

[14] It appears it is not unknown for a wife not to know her husband's given names or to spell his surname incorrectly. This problem has been encountered in connection with section 5 of the new Divorce Act, where provisions are set up to deal with petitions pending before different courts and where it is therefore necessary to know when more than one petition is in existence.

processing and may, in fact, be areas where a more sophisticated approach to information retrieval is the ultimate answer. [15]

3. *Statutes*

The writer will here confine his comments to the question of information retrieval since the application of the computer to the legislative process generally, including computer aided drafting, bill processing and printing, has been dealt with elsewhere. [16]

The greatest difference between case law and statute law is that with regard to the latter there is a finite quantity. It extends from the previous revision, which should be, in theory at least, no more than ten years earlier, up to the present time. The same is not true of case law.

The approach with statute law has been to begin by putting the full text of the statute onto magnetic tape. This is treated as the master file. As it is critical that data on the tape be accurate, it is printed out usually in upper and lower case letters [17] and then carefully proofread. In addition the computer may be used to create an alphabetical word frequency analysis. Since every word, however slight the difference in spelling, receives a separate entry in this list, misspelt words are easily spotted by checking the words which have a low frequency of occurrence. Their location can be discovered by the computer-created concordance which lists alphabetically each word with its location in the statute. Common or "non-significant" [18] words are expressly deleted from this list.

Our present search techniques [19] involves the location of information by comparing words given by the person making the inquiry with words in the body of the data. As we have seen already, where specific words are sought there is no difficulty in locating them. Where, however, the user is concerned with a concept rather than specific words, he locates the concept by selecting words which are likely to be associated with that concept. Thus if the computer is able to locate an area of the statute where these words exist together, it is highly likely that the concept is dealt with at that place.

This search can be carried out on the full text of the statute, but although the time involved is quite small, it is inefficient in computer terms. It has been calculated that about forty percent of a statute consists of "non-significant" words. These are words which have no real meaning in themselves and simply join "significant" words together. Thus a full text search may be as much as forty percent inefficient.

The next step, therefore, is to remove these "non-significant" words.

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[15] *Supra* note 6.

[16] Skelly, *Computers and the Law*, 33 SASK. L. REV. 167 (1968), and REPORT OF THE COMPUTERS—LAW CONFERENCE, Queen's University (June 1968).

[17] *Id.* This assists in proofreading and is essential if the data is to be used for other purposes in addition to retrieval.

[18] See *infra* at 444.

[19] See *supra* at 437.

This is done by the computer as part of the process of creating a concordance. The concordance, as mentioned before, consists of an alphabetical list of only the "significant" words in the statute together with their locations.

A search is then carried out on the concordance rather than on the full text of the statute. The concordance can be stored on magnetic tape and searched sequentially, but a still more efficient approach is to store it on a direct access device such as a magnetic disk. With the concordance on a disk, it is possible to go, by means of a computer-created system of indexes, to a specific location and retrieve information without searching through the whole of the concordance.

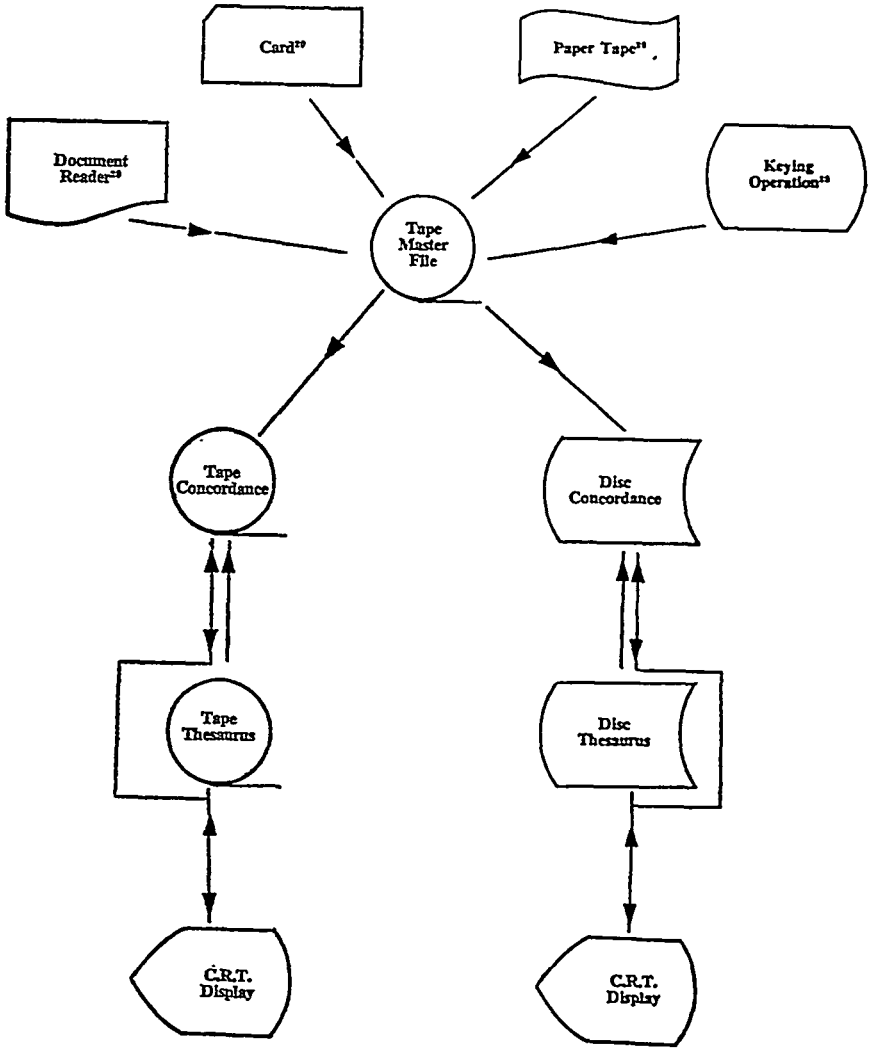
The system can be indexed to the first letter of a word so that if the searcher considered the words *maintenance* and *wife* were likely to locate the information he desired, the computer would be able to limit the search to the areas in the concordance occupied by the words beginning with *m* and *w*. This again would considerably reduce the search time involved. Further indexing to second or third letters of the word could be done if found desirable.

When so much emphasis is placed on words by the system, it is important that allowances be made for synonyms of such words which may appear in the statute. These may be just as important to the searcher as the actual word he has specified. One approach is to require the searcher to enter all possible synonyms of the words he is interested in at the time of his inquiry. This is not a good solution, however, as he may well not remember all likely synonyms and it would be inefficient in terms of time for each searcher to have to input virtually the same words over and over again.

The better approach is to create a thesaurus which the computer itself can refer to in order to find appropriate synonyms. Before he began his searches, the user would be able to peruse a print-out of what the thesaurus contained, decide if he wished the computer to refer to it, and if he decides in the affirmative, enter the appropriate symbol before each word of his inquiry of which synonyms were required. If he did not want a word which the thesaurus considered a synonym, treated as one, he would have the power to reject it.

Where a word has a different grammatical ending from the searcher's inquiry word, then the computer will not locate it unless provision is made for this. This can be done either by including such grammatical endings in the thesaurus against that particular word or by giving the searcher the ability to cut-off the latter part of a word, perhaps by an asterisk. Thus if the search word is "murder," the computer would find only that specific word, but if "murder*," were entered, such words as "murders," "murder's," "murderer," "murdering," and "murdered" would be found.

Having available the ability to locate words easily in this way, the final problem is the relationship of words within the statute itself. In other words,



SIMPLIFIED DIAGRAM OF STATUTE RETRIEVAL SYSTEM

[20] *Supra* note 2.

how may the statute be broken down when a search is being made.

The first obvious division is by sections. If two words are being searched for and one is found in one section of a statute and the other in another, then these are not going to be related in the way the searcher wants. The same is true of sub-sections which are drafted in a semi-independent way, but lower levels such as clauses and sub-clauses are not so drafted. They are interrelated parts of the subsection. However, it is not sufficient to say that a valid reference has been found provided the two words exist within the same subsection. Consideration must be given to the actual relationship of clauses and sub-clauses.

To take a simple example, subsection 3 of section 24 of the Manitoba Condominium Act [21] states that:

> 24(3) An administrator appointed under subsection (2) shall
> (a) to the exclusion of the corporation, have such of the powers and duties of the corporation as the court shall order;
> (b) have the right to delegate any of the powers so vested in him; and
> (c) be paid for his services by the corporation, which payments are common expenses.

If the searcher was looking for a provision concerning the right of the administrator to delegate his duties he might enter the words: *administrator, delegate, duties.*

If a subsection were treated as one complete unit he would be informed that the information he wanted existed in subsection 3 of section 24. This is not in fact correct, since 24(3)(b) refers only to delegation of powers not duties. Thus if the subsection is considered as consisting of four parts, the words would have the references: *administrator* 24(3); *delegate* clause (b); *duties* clause (a).

This combination does not amount to a valid reference. A valid reference must consist of any combination of section 24(3) with any one only of the clauses.

Finally, it is the writer's belief that the computer should only be asked to retrieve a reference for information purposes rather than the actual text of the statute. Although the full text could be retrieved, it is time consuming [22] and in fact, where a concordance type search has been made, it will be necessary for the computer to refer to another file to locate the full text. It is also unnecessary since the vast majority of people who use the system will have access to a printed version of the statutes. In addition, although the searcher is given a specific section or clause which interests him, he will frequently need to consult surrounding sections of the text to get the total picture. [23]

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[21] Man. Stat. 1968 c. 10.

[22] Full text retrieval by means of a typewriter terminal is virtually out of the question because of its very slow output speed.

[23] If a copy of the statutes was not available to the searcher a Xerox or micro-

4. *Case Law*

Case law presents a quite different problem in regard to computer retrieval of information than that presented by statute law.

Wherever possible it is desirable to use the computer to index data as part of its information retrieval process rather than index data manually first before handing it over to the computer. There are two very good reasons for this. Although man is at present in many ways a better indexer than the computer, since he understands concepts and such basics as the various meanings of words, he is slow, expensive and may not always be impartial. In the statute area, we avoid human indexing of data by handing over the data in full text to the computer and, with the exception of non-significant words, allow it to create a new index every time it searches, destroying it immediately when it has finished.

Unfortunately, things are not that simple in the case law area. We could put the full text of every decision ever reported, which had not been reversed or overruled, into machine readable form, store them on magnetic tape or disk and then carry out a similar type of search to that done on the statutes. There are two major drawbacks to this. The first, a very obvious one, is that the volume of data which this would involve would be enormous.

Secondly, a search of the type employed on the statutes is unlikely to produce good results, as words in judicial decision may not have the same significance that they have in a carefully drafted statute which may have been revised and amended a number of times. Also, things seem to slip into judgments which do not appear to relate entirely to the matter with which the case is concerned. All of these things point to the fact that some analysis of the decision is necessary either as a part of, or before the computer retrieval process takes place.

Various types of manual analysis such as the use of key words to signify the meaning of a case have been tried, but results on the whole have been only average. [24]

Ideally, a panel of experts might be established to produce a carefully worded abstract of each case, but the cost of this would be astronomical. Experiments are taking place in Europe, with the judge who decides a case, being required to provide with his judgment a short abstract of his decision. This can then be used by the computer for search purposes in the same way as a statute.

The use of the computer itself to analyze decisions and produce meaningful abstracts is also an answer but a great deal of time and effort will be required before this is possible.

The ideal answer at this stage would be to codify the major areas of the common law to provide a starting point for a data bank of abstracts of subsequent cases.

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film mailed to him would be a better answer.

[24] *Supra* note 3.

IV. CURRENT DEVELOPMENTS

As much as ten or twelve years ago, experiments were being carried out in the United States on the application of the computer to the legal area. Today, computers are involved there in many areas of law, and legal administration generally.

In Canada, interest so far has been centered mainly on its application to statute and case law. Several provinces are showing interest in creating computer data banks of their statutes. Manitoba has already completed the process of storing its new revised statutes on tape. The Manitoba tape is being used for information retrieval purposes and in addition the printed edition of the new revised statutes will be produced from the tape by an automated process known as computerized photocomposition. It also appears that the federal government is following the same procedure for its new revised statutes.

In the area of case law, Queen's University and the University of Montreal are working together to establish a bilingual data bank of cases for information retrieval purposes.

A study is being carried out in Manitoba on the question of computer storage and retrieval of real property titles, and personal property interests. The main problem in the real property area is the initial cost involved in computerizing the backlog of titles. With regard to personal property the Ontario government is in the process of developing a storage and retrieval system. [25]

V. CONCLUSION

It is the writer's belief that it will not be long before the telecommunications terminal is as familiar a piece of equipment for a legal firm as the office typewriter. From this device, it will be possible to dial into any information retrieval system and retrieve the information desired within a matter of minutes or even seconds.

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[25] Further uses of the computer in drawing up routine documents and aiding in solicitor-client interviews are detailed in McCoy & Chatterton, *Computer—Assisted Legal Services*, 11 L. & COMPT. TECH. 2 (1968).