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A Case for Computers in Law Practice

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THERE IS NO PROFESSION which has more to gain from dramatic new technological developments for the automation of information than the legal profession.[1]

The Information Explosion

An "information explosion" is at hand—one that is causing the world's libraries to increase in volume at the rate of 35,000 words per second, or one million volumes annually. More pointedly, the number of reported judicial decisions has grown beyond 2,300,000, at a current increase rate of around 22,000 per month.[2] In light of these figures, the population explosion, and the growing social, political and economic complexities of American society, it appears certain that the lawyer cannot continue to be effective with his present research tools alone. His problem is becoming increasingly like that of the scientist—It is not that he does not know; rather, he does not know what he knows.[3]

The law as an institution is suffering from the growing mountain of legal literature[4] which is simply beyond manageable use in terms of money, time or utility.[5] Since there seems to be little chance of controlling this growth, some means must be found whereby a lawyer can readily sort out only that literature which is pertinent to his needs.[6] Presently, the lawyer's problem is burdensome; in the near future, it may become overwhelming. One concerned practitioner predicts dire conse-

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1 Law Research Service, "Computerized National Law in Action" (1967).

2 Kayton, Retrieving Case Law by Computer: Fact, Fiction, and Future, 35 Geo. Wash. L. Rev. 1, 6 (1966) [hereinafter cited as Kayton].

3 Brown, Electronic Brains and the Legal Mind: Computing the Data Computer's Collision With Law, 71 Yale L. J. 239, 253 (1961) [hereinafter cited as Brown].

4 "Legal literature," as the phrase is used in this paper, encompasses all published materials regarding law and the judicial process. This includes statutes, case decisions, administrative proceedings, law reports, legal encyclopedias, legal periodicals and other secondary sources.

5 Brown, *supra* note 3, at 240.

6 New York State does not report all decisions. Rather, a policy of selective reporting exists, wherein only cases deemed to be of educational and precedent value are published. Despite the obvious dangers of this policy, its inception and furtherance is adequate proof of the proportion of the information-management problem. It is doubtful that this approach will resolve or even alleviate the problem, since forty-nine other state jurisdictions, the federal judiciary, and the multitude of administrative agencies would need to adopt this self-regulating policy of decision writing. *See* Kayton, *supra* note 2, for a discussion of this selective reporting scheme.

quences for the American judicial system if the voluminous output is extended beyond the grasp of lawyers and judges alike.[7]

The prime function of legal research is to collect that information from the past which will enable the lawyer to educate himself to better cope with an existing problem. If legal research does not perform that function, it has no meaningful function in law.[8] Indeed, in situations involving conflict, information is armament for the lawyer.[9] Uninformed or misinformed, he is vulnerable, but no longer can his vulnerability be blamed entirely on neglectful preparation.[10] His most important function is to assimilate relevant data, analyze it, and formulate his strategy for an up-coming legal encounter. For the lawyer to be forced to restrict these functions because of massive research undertakings, or, on the other hand, to abbreviate research efforts because of a time limitation, may well lead to a piercing of his armament.

The cost of collecting pertinent legal information is doubtless a major item of expense for the lawyer. Whether a law clerk or the lawyer himself undertakes research, the cost is becoming prohibitive. If done by a clerk, the expense may be computed in terms of dollars; done by the lawyer, it can be viewed as a great waste of time and highly-skilled brainpower.[11] Most lawyers, at one time or another, have marveled at the command of English law possessed by Mansfield and Blackstone during their careers. Seldom, one would guess, have they reflected on the fact that our "burden," as compared to theirs, is some 230 times as great.[12]

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[7] Letter from E. Blythe Stayson, Administrator of the American Bar Association, and William B. Eldridge, Project Director, Legal Methods and Materials, to the Executive Committee and Research Committee of the American Bar Association, May 7, 1962. Eldridge fears, as a practical matter, the passing of the common law system unless relevant literature remains reasonably accessible to the lawyer whose researching efforts must necessarily be limited. As the law becomes increasingly interwoven into the political, social, and economic aspects of modern society, added responsibility will adhere to both judges and lawyers. This increased responsibility will bring increased literature. Undiscovered literature often means confused resolutions of issues, which in turn produces more masses of critical and explanatory literature. And so the problem would spiral; diffusion, resulting in confusion, would necessitate the codification of all law to prevent total disorder in the nation's courts.

[8] Kayton, *supra* note 2, at 5.

[9] Cowan, Decision Theory in Law, Science, and Technology, Communication Sciences and Law 199, 217 (1965) [hereinafter cited as Cowan].

[10] Kayton, *supra* note 2, at 5. Kayton notes that following the law has been likened to trying to drive an automobile while looking through the rear-view mirror. Progress forward is hampered, if the mirror is distorted, by virtue of imperfect knowledge of that which is going on behind. If the driver must spend most of his time looking into the rear-view mirror, he will have too little time to look at the road ahead.

[11] Wilson, Computer Retrieval of Case Law, 16 SW. L. J. 409 (1962).

[12] Kayton, *supra* note 2, at 6. At the time these two great jurists were living, there were only 10,000 reported decisions. As mentioned above, the modern lawyer must cope with over 2,300,000 decisions. Moreover, today's decisions spring from a myriad of courts and jurisdictions whose operations would surely befuddle these legal lions were they to witness our legal system.

A Potential Solution

In what has been described as "the second Industrial Revolution," [13] "the Quiet Revolution," [14] and countless other terms, both laudatory and critical, the electronic computer—a potential solution to the lawyer's research problem—has evolved.[15] In less than two decades, it has experienced a fantastic rate of growth.[16] The first generation of computers (characterized by electron tubes) and the second generation (characterized by transistors) have given way to the present third generation of computers.[17] It is altogether reasonable to predict that a fourth generation will be announced before this decade's end. What this fourth generation will bring in terms of physical changes and increased capabilities is sometimes difficult to conceive—even for one who works daily with computers.

Despite the wondrous and romantic abilities that the mass media would have us attribute to the computer, it is basically a simple tool. It can perform only certain types of extraordinarily simple operations, but because it is able to perform them upon astronomically large amounts of data at speeds almost too fast to comprehend,[18] an advantage is clearly obtained.[19] A computer programmer would be the first to testify that the computer is not an inherently clever device. It must be flawlessly instructed, step by step, in order to accomplish a desired result.[20]

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[13] Lawlor, What Computers Can Do: Analysis and Prediction of Judicial Decisions, 49 A.B.A.J. 337 (1963).

[14] Pitt, The Quiet Revolution: Computers Come of Age, American Federation of Information Processing Societies (AFIPS) (1966).

[15] Cowan, *supra* note 9, at 223. Cowan aptly describes the computer as a vital new scientific instrument whose capabilities resemble those of the telescope and the microscope in the history and development of physical and biological science.

[16] 1952 is often referred to as the date when computers made their presence felt. It was then that scientific experiments began to render practical applications. That which occurred prior to 1952 may be likened to the gestation period of an animal—the formative interval of a creature yet to be born. *See* Pitt, *supra* note 14.

[17] Third generation computers are characterized by integrated circuitry. One such circuit is about one-half the area of the eye of a sewing needle—significantly smaller than the bulky tube and transistor circuits characteristic of previous generations.

[18] The term "nanosecond" is associated with third generation computer timing. A nanosecond is one-billionth of a second. Stated in more conceptual terms, it can be pointed out that there are as many nanoseconds in one second as there are seconds in thirty years.

[19] Kayton, *supra* note 2, at 9.

[20] It would appear that the general public is unaware of this requirement. Largely through distortions attributable to the mass media, the public tends to view computers as cubicles of flashing lights manned by disheveled scientists seeking and obtaining answers to unanswerable questions. Nothing could be farther from the truth. The following story should further illustrate this point:

> A group of scientists decided to seek the answer to the "ultimate question." *Having painstakingly prepared over a period of many months, they fed the necessary instructions and data into a large computer* and then asked of it, "Is there a God?" The cacophony of the printer was soon heard causing the scien-

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The most obvious reason for the remarkable growth of the computer industry has been the successful application of its yield to business operations.[21] The computer spares business repetitive processes of an essentially impersonal character, which have proved most profitable if done in the easiest way possible.[22] Unlike the typewriter or other manual-mechanical business gear, the computer multiplies brain power, not merely the power of one or several of the sense receptors of men.[23] Thus, it liberates business personnel, both management and staff, from manual tasks and permits their performing more sophisticated projects. More and more significant and complicated duties are being performed daily by the computer as it continues to lighten man's burden. Computers are presently guiding missiles, teaching children, aiding doctors in diagnosing diseases, monitoring the condition of hospital patients, controlling the production of precision instruments, and, through intricate management information systems, rendering corporations up-to-the-moment reports on both current status and future "observations." Further attempts to use this new tool to improve the world are limited only by the boundaries of man's imagination.[24]

The power and benefits of the computer can be brought directly to the offices and doorsteps of a whole host of new users.[25] When will it be brought to the rescue of the lawyer who must contend with an information avalanche about to bury him? The computer hardware is now available.[26] It is awaiting adaptation to the job of maintaining and efficiently retrieving stored legal information.[27]

Information Retrieval

"Information retrieval" has been described as a process whereby specific documents or texts can be extracted by code from computer storage at will.[28] The most significant systems device in an information

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tists to scurry to this—the computer's "voice." The reply was short and simple—"Not until now."

The premise and conclusion would surely be retold, time and again, by one who would deem the story worth repeating. However, that which is italicized would probably be overlooked by one unfamiliar with computers and their characteristics.

21 Securities Research Division of Merrill, Lynch, Pierce, Fenner and Smith, Inc., "Investing in the Computer Industry" (1967). The value of computer and related industry shipments totaled $300-$400 million in 1955, grew to more than $6½ billion in 1966, and may reach an annual rate of $15 billion by 1975.

22 Cowan, *supra* note 9, at 218.

23 *Id.* at 224.

24 Pitt, *supra* note 14.

25 *Ibid.*

26 Law Research Service, *supra* note 1.

27 Cowan, *supra* note 9, at 221.

28 Kondusky, Introduction To Information Retrieval, March 26, 1964 (technical paper presented to RCA Systems Achievement Club).

retrieval application must necessarily be a storage unit of great capacity.[29] Such a device would need to be "on-line"—that is, directly accessible by the computer the function of which would be to perform a series of logic operations in response to instructions given by the researcher who seeks data residing in the storage unit.

Numerous experiments have been conducted involving legal information retrieval.[30] These experiments may be broken down generally into two types: The retrieval of statutory law and the retrieval of case law. The differences between the two are significant. Those who have tried to use techniques developed for retrieving statutory materials in attempting to retrieve case law soon recognized the qualitative difference in the technical requirements between the two applications.[31] The retrieval of statutory law is much less complex as can be evidenced by the number of such systems now successfully operating. The most publicized experiment, that which laid the groundwork for statutory retrieval systems, was conducted by John Horty of the University of Pittsburgh.[32] His successful computerization of Pittsburgh city ordinances has led, either directly or indirectly, to computer usage by the state governments of New York, New Jersey, Pennsylvania, Ohio, Kansas, Nebraska and Texas.[33] It seems probable that by 1970 most of the states will have initiated computer systems for searching state statutes. Some states are presently using a computer for keeping track of bills introduced into their legislatures. In this type of application, the system offers an instantaneous tracing of the status of all bills undergoing legislative refinement.[34]

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[29] One RCA 70/568 Mass Storage Unit, with which the author is familiar, is capable of storing 536,870,912 characters of information. Depending on the size of the computer utilized, it is feasible to place many such units "on-line," thus making possible a storage capacity of billions of characters. For example, if each case decision averaged 10,000 characters (or 1,250 eight character words), all of the reported judicial decisions to date could be placed within forty-eight such units. *See* Kayton *supra* note 2 and 12. More realistically, two such units could adequately house the reported decisions to be found in the Ohio State Reports, the Ohio Appellate Reports, and the Ohio Law Abstracts with storage to spare. *See infra* note 54.

[30] The most illuminating source on reported experiments is, Special Committee on Electronic Data Retrieval of the American Bar Association, "Computers and the Law" (R. Bigelow ed. 1966).

[31] Kayton, *supra* note 2, at 10.

[32] For a detailed analysis of the Horty experiment, *see* Springer, Application of Information Retrieval Techniques: Preparation of the Ordinances of Pittsburgh, 26 Pitts. L. Rev. 551 (1965).

[33] Special Committee, *supra* note 30, at 49.

[34] Letter from Haydon Burns, former Governor of Florida, to Ed Fraser, Secretary of the Florida Senate, July 14, 1965. The following excerpt attests to the success of the computer in this capacity:

> It is my unqualified opinion that this equipment (retrieval system) amounted to a revolution in the legislative process in allowing us to keep up minute-by-minute with the happenings of the session. . . . It has proved to be a great labor saver and a most economical venture. With the tremendous volume of legislation flowing through our offices each day, this equipment allowed us to know . . . the status of all bills and resolutions. In a phrase, it permitted "instant history."

Most articles pertaining to legal information retrieval begin with a statement of conviction by the researcher that certain procedures are essential.[35] As a result, there are as many theories regarding the best approach for gaining optimum results as there are experimenting researchers.[36] The most practical way to implement a retrieval system, however, is the way best tailored to the nature of the literature to be searched and to the particular needs of the searcher of that literature.[37]

Storing Legal Information

There are two basic approaches to the task of storing legal information in mass form, each having advantages and disadvantages. The better method has been termed the "full text" approach, wherein the entire text (omitting simple or common words) of a statute or case decision is stored.[38] As each section of a statute or each case decision is put into the computer, it is assigned a document number. Each sentence of the document is then assigned a sentence number and each word therein a word number. A computer-generated indexing system is then created to serve as a communications link between the "on-line" data and the researcher. Such an index could be an alphabetical listing of every word in the body of stored documents—a listing that would then become the basic tool for searching the file, or, in the instance of case law, it could be a programmed indexing system that would accommodate all the grammatical forms of a single word. Several other possibilities to the indexing approach are feasible, depending on the preference of the researcher.[39] Despite the many advantages of the "full text" approach,[40] a major shortcoming is the high cost of transforming the legal text into machine-readable format.[41]

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[35] Stayson-Eldridge letter, *supra* note 7.

[36] Researchers generally agree as to what the ideal information retrieval system should yield in terms of output. Their methodology, however, is usually at variance. Eldridge and Dennis, The Computer as a Tool for Legal Research, 28 Law & Contemp. Prob. 78, 81 (1963), concisely summarize the ideal system most experimenting researchers would accept:

1) It would be language rather than subject oriented, so as to possibly permit storage without indexing procedures.

2) It would have a built-in capacity for automatic, large-scaled reorganization and reclassification of data.

3) It would present to the researcher a wide variety of searching strategies.

4) No human buffer would need to be interposed between the user and the system.

[37] Kayton, *supra* note 2, at 14.

[38] *Ibid.*

[39] *See* Eldridge and Dennis, *supra* note 36.

[40] Kayton, *supra* note 2, at 15, 16.

[41] *Id.* at 16. Kayton discloses that commercial keypunching services charge $20,000 per million words.

The second retrieval technique has been called the "depth indexed-text" approach.[42] Human indexers analyze each statute or case decision and assign several descriptive words or phrases. These "descriptors," together with selected excerpts of the text (if desired) are then entered into storage. Although conversion costs are significantly reduced since full text transformation is avoided, serious shortcomings are evident. The human indexers would need to be experts in the area of substantive law. In all likelihood, they could only be made available at what would be a prohibitive expense. Moreover, there is a possible loss of vast amounts of information in converting from a document to its description.[43] Serious inconsistencies would result, since no two indexers are likely to view the same problem in precisely the same way. Advances in the "depth indexed-text" approach to information retrieval hinge on the acquisition of more and more precise knowledge of the relations between the thoughts, ideas, and information which individuals attempt to express, and the language used to express them.[44]

The "full text" approach, at present, is clearly the more preferable of the two basic methods of storing legal data.

Retrieving Legal Information

Searching for pertinent statutes or cases would be accomplished by feeding into the computer as many groups of search words, alone or in combination, as the researcher deems adequate. His requests might be set up on a word association basis, on a word position basis, or on a combination of the two. When the word association basis is utilized, those documents containing all the search words anywhere in their titles, headnotes, descriptors, or text would be extracted. There might be instances, however, when the word association technique would not render the desired result. For example, if all cases dealing with assumption of risk were requested, the words "assumption," "of," "risk" could foreseeably appear within a document but be entirely unrelated. Therefore, a word position basis would be necessary. When framing this type of request, the researcher would demand that the words "assumption of risk" appear contiguously in storage, thereby greatly reducing the chances for retrieving unwanted, irrelevant information.[45]

The most important problem facing the legal community in the matter of data retrieval is what *not* to retrieve.[46] Ideally, a retrieval system should produce all cases containing information of value in answering

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[42] Kayton, *supra* note 2, at 20.

[43] Allen, Brooks and James, Automatic Retrieval of Legal Literature: Why and How, 82 (1962).

[44] *Id.* at 89.

[45] Kondusky, *supra* note 28.

[46] Cowan, *supra* note 9, at 221.

a question, and it should produce no other cases.[47] The test, then, is what is essential in terms of output.[48] Since computer output is contingent upon input, it can only be as relevant as are the researcher's skills and techniques in relation to the data in storage. Thus, retrieval success involves both a knowledge of the legal issues in any particular problem and a familiarity with the nature and operation of the computer system.

The Synonym Problem

As pointed out above, successful statutory retrieval has been more readily achieved than case law retrieval. The primary reason for this should be understandable. Statutes, as products of legislatures, are carefully worded and phrased, whereas case decisions, as efforts of individual judges, are not. Every statutory term has a precise meaning within the context of its usage, and the repetition of such wording or phraseology throughout a code may be properly assumed to have an identical, unambiguous meaning. Legislatures are not inclined to invoke a series of synonymous terms in reference to the same legal issue, since it is most important that those who must necessarily construe legislative intent not be forced to grope with terms generally synonymous but actually unidentical. Varied and confused constructions of unclear legislative intent could well lead to grave disorders, the full impact of which would be felt by an aggrieved society unable to comprehend the guidelines of conduct the law should afford.

Wilson and Kayton both recognize this "synonym problem" as the most difficult to overcome in defining a workable system of case law retrieval.[49] Although judges writing case opinions *may* be themselves consistent in the use of a single legal term or phrase, there is little likelihood that different judges would be consistent in such use. For example, the terms "remuneration," "consideration," "salary," "wages," "bonus" and "emolument" might be used by different judges (or possibly the same judge) in reference to the same point in question. Were a researcher to request all case decisions involving "remuneration" for officers of charitable corporations, could he be assured of retrieving all those cases he might require? Surely not. Possible synonym combinations in the above request would be equal to no less than 1,008 different word configurations.[50] However appropriate to literary style, the synonym is nevertheless burdensome to the legal researcher.

There remains also the problem of singular and plural versions of the same word, misspellings, rare forms of spelling, word opposites and

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[47] Kayton, *supra* note 2, at 13.

[48] Stayson-Eldridge letter, *supra* note 7.

[49] Wilson, *supra* note 11, at 429-432; Kayton, *supra* note 2, at 22-42.

[50] Kayton, *supra* note 2, at 25.

homographs. In the latter instance, if the lawyer were to seek those cases within which the term "bar" occurred, he would doubtlessly retrieve output that pertained to 1) a legal association, 2) a rail, 3) a court or bench, 4) a tavern, 5) the act of bolting or fastening, and 6) the act of restraining or excluding.[51] Applying the test of what is essential in terms of output, it should appear obvious that a search using "bar" will fail since it would yield far more than that which would be applicable to a particular need.

SYNDIG (SYNonym DIctionary Generator), the creation of Kayton, may well provide the solution to this—the most difficult obstacle to efficient case law retrieval.[52] Operating under the theory that a finite number of cases (and thus words and phrases) would eventually be entered into mass storage, human experts in handling language would first work in senior partnership with computers.[53] Prior to the application of computer processing and storing, human experts would evaluate, one word at a time, the meaning of a word within the context of a sentence. From such an evaluation would come a synonym list that would then be machine-compiled into a thesaurus or "association map." Hence, on the issuance of a command for any word within a predetermined synonym group, all words therein would be utilized to retrieve the cases to which they apply. Successful experiments have been conducted and it seems likely at this time that SYNDIG, or some similar procedure, will become the basis for successful case law retrieval systems in the future.

The Emancipated Lawyer

A perfected retrieval system would permit the lawyer to enjoy freedoms he has never before known. Confronted with a problem, he could turn to his thesaurus (whatever its nature), select the appropriate words or phrases, key into his system, and, in a matter of seconds, obtain relevant computer printouts. Any subsequent system activities would then be dependent on his particular needs. If the initial request were adequately framed, he would not need to proceed further. If the listing of relevant materials were deemed too great or too little, he might more narrowly refine his request or more broadly frame his request depending on his needs. Most importantly, the lawyer would possess, at his fingertips (or at those of his secretary), a library adequate to his needs. He would command a method of research that would free him to expend the greater part of his time and efforts in analyzing and predicting—that which he is best qualified to do.

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[51] *Id.* at 30, 31.

[52] *Id.* at 10, 31-42.

[53] *Id.* at 32.

Costs and Contributions

The cost of experimenting to bring about a functional case law retrieval system is considerable.[54] A co-operative financing effort of some type will surely be necessary. In addition to text conversion costs, there remains the need to carefully evaluate experimental results and to make the necessary modifications of techniques so as to assure optimum utility.[55] Moreover, total credibility of the results of computerized legal research can only be established by lengthy and continuing comparisons with the results of the best research method otherwise available.[56] Thus, manual research techniques presently used must serve as criteria for that which will eventually replace them.

Such undertakings will require a substantial budget. Perhaps the arrangement whereby the ABF-IBM Pilot experiment was financed is indicative of how this cost might be most effectively absorbed.[57] Total expenditure for this 1962-1963 experiment was $135,000. The American Bar Foundation contributed $30,000; the IBM Corporation, giant among the computer manufacturers, granted $65,000; and various supporting grants totaled $40,000. It seems altogether fitting and proper that computer manufacturers absorb the largest share of financing these experiments, since they stand to reap the profits from sales and rentals once successful retrieval systems are finally developed. Perhaps government, both federal and local, should also contribute since it has much to gain from the orderly progression of the existing legal system.

Monetary and scholarly contributions may be gained from an international source. One of the most fascinating applications proposed for the retrieval of law has been that devised by the Law Research Service.[58] Although somewhat idealistic in its enthusiasm, Law Research Service envisions an international application of computerized retrieval that would permit participating nations to gain instant insight into the comparative law of neighboring sovereignties. Such a practice, contends Law Research Service, would be the first step toward a general acceptance of law as a basis for future world peace. With the language barrier shattered by computer translating techniques, knowledge and perhaps appreciation of a neighbor's legal system could be readily attainable. The

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[54] Kayton's published experiment with SYNDIG involved 73 related cases. He reports that approximately 40,000 words were processed at the rate of about 300 words per hour. It thus took 135 hours of human contribution coupled with 10 hours of IBM 7094 computer time. It is staggering to consider the cost in terms of time and dollars to "thesaurize," say, 56,000 decisions—the approximate total to be found in the Ohio State Reports, the Ohio Appellate Reports, and the Ohio Law Abstracts.

[55] Stayson-Eldridge letter, *supra* note 7.

[56] Kayton, *supra* note 2, at 12.

[57] Stayson-Eldridge letter, *supra* note 7.

[58] Law Research Service, *supra* note 1.

computer hardware is presently available for such an enterprise.[59] Several practical considerations, however, loom as obstacles to this admittedly worthwhile enterprise.[60]

Cost burdens alone will certainly not be the sole determinant in the advent of widespread computerized law retrieval. When lawyers are finally driven to desperation as a result of their faultless inability to find the law, they will have much to say about the implementation of legal information retrieval systems.[61] That time is rapidly approaching.

Computer-Law Interrelationships

As with any of man's ingenious devices, the existence of the computer spells trouble, and trouble spells litigation.[62] The computer is thus destined to become intricately entangled within the law in many areas other than information retrieval. Already, computers are making inroads into areas of law that will ultimately render significant substantive and procedural results.[63]

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[59] Through the Western Union TELEX COMMUNICATIONS SYSTEM, remote users, by keying in through proper requests, could gain access to a computer system to which all of a participating nations' laws had been stored. In a matter of moments, appropriate responses, neatly translated, could be displayed on the remote user's teletype or video data terminal. This approach is closely akin to the timesharing concept discussed below. *See infra* note 61.

[60] To what degree knowledge of a neighboring government's law would promote peace is highly debatable. It seems improbable that an integrated legal system—in the vein of the so-called "One World" concept—will ever be derived from such a grandiose scheme. The author believes strongly that before the United States partakes in such an adventure, serious domestic housekeeping chores need to be first accomplished in relation to computerized retrieval.

[61] What will be the cost of a perfected retrieval system to the lawyer? Obviously, cost would be dependent upon the size of the system in terms of both computer equipment and required manpower, and probably will extend beyond the means of most law firms. A likely and desirable solution to this cost problem can be realized through the technique of computer "timesharing." As its name indicates, timesharing is a technique wherein several different subscribers are "on-line" with a computer retrieval system located perhaps many miles from such subscribers. Since these users would be interested in the same data in storage, they could each pay a share of the system's cost, and thus alleviate individual cost burdens. So rapid are third generation computers that many users could seemingly control the retrieval system simultaneously. The author predicts that timesharing will become the principal mode of legal information retrieval in the future.

[62] Brown, *supra* note 3, at 248. Brown broadly envisions a triple relationship between computers and the law: 1) the storage and retrieval of legal information as discussed above; 2) the computer as a source of legal problems arising from its use or nonuse; and 3) computer output as testimonial evidence for use in court.

[63] For example, state legislative redistricting, a consistent thorn in the federal-state relationship since 1962, is capable of being resolved by computers thus bringing to an end the constant litigation and increasing friction generated by human attempts to redistrict manually. *See* Baker v. Carr, 369 U.S. 186, 251-264, 340-349 (1962). In a concurring opinion, Justice Clark presented a mathematical formula designed to resolve state reapportionment problems—a formula attacked by the dissenters, Harlan and Frankfurter, on the grounds that it would create a "mathematical quagmire" that would unduly burden the federal courts in their operations.

See Adams, An Introduction to Data Processing in Trial Courts, SDC Publication

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Most judges and lawyers probably would not actively oppose the introduction of efficient computer techniques into the administration of justice, even though such techniques would replace what are now thought of as matters of legal expertise and discretion.[64] In view of the ever-increasing demands being made upon it, there exists a need for "streamlining" American justice—a need almost too pressing to philosophize about or to debate.

Since computers have become an integral part of business transactions, whether industrial, financial or accounting in nature, there has arisen an "evidence problem" which has already undergone judicial scrutiny. The courts' reaction to computer printouts, having been entered as evidence, is probably indicative of how the courts will generally receive the computer and all its ramifications. In *Transport Indemnity Co. v. Seib*,[65] a Nebraska appellate court affirmed a trial court's judgment that computer printouts were admissible as evidence when introduced in conformity to existing rules of state law. The federal courts have acted similarly, thus leading to the presumption that the law, flexible as it is, will accept the computer.[66] Indeed, the law has a positive duty to accommodate itself to that which is reliable and acceptable in the market place.[67] Computer-related evidentiary materials that may become involved in litigation are as broad as are the varied procedures of record-keeping.[68] The law will need to undergo considerable adjustment.

As can be inferred from the above, jurists too will need to adjust to the computer. The most controversial computer-law application—that of predicting judicial decisions—furnishes adequate proof of this. Case decision prediction, if perfected, could become the most significant of computer-law applications simply because it is far more glamorous than others. Most literature concerning such prediction, however, is pessimis-

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SP-1409 (1963). In the larger metropolitan courts of America, the criminal case is often stalled for more than six months, and the civil docket is commonly delayed two or three years because of the courts' outmoded procedures of manually preparing and effectuating court dockets and records. A computer could be used most advantageously to resolve this problem of lagging justice. A successful automation procedure experiment was carried out by the Systems Development Corporation in the Superior Court of Los Angeles County, the largest trial court of general jurisdiction in the world, and one plagued by its inability to efficiently control the administration of justice. The above article discusses and evaluates the Los Angeles experiment as well as others similar in objective.

[64] Cowan, *supra* note 9, at 222.

[65] 178 Neb. 253, 132 N.W. 2d 871 (1965).

[66] Louisville & Nashville R.R. Co. v. Knox Homes Corp., 343 F. 2d 887 (5th Cir. 1965); First Nat'l Bank of Birmingham, Ala. v. U.S., 358 F. 2d 625 (5th Cir. 1966).

[67] Brown, *supra* note 3, at 248.

[68] Freed, Computer Print-outs as Evidence, 16 Am. Jur. Proof of Facts 273, 295 (1965).

tic about its accuracy.[69] The leading proponent of this application has developed and furthered, through experiments, a theory of "personal stare decisis" wherein the decisional behavior of each involved judge can be determined from his previous bench performances and then equated in accord with his personal background.[70] Computer calculations, based on weighted criteria derived from the above findings, could then be made in a few minutes—calculations that would take an individual a lifetime to complete.[71]

Proponents of personal stare decisis have been bitterly reproached by those who consider such efforts as little more than foolishness.[72] Not only are the predictor's necessary assumptions so tenuous as to yield invalid results, but reliance on computers would assuredly blunt a lawyer's professional skills, just as undue reliance on laboratory reports detracts from the accuracy of the doctor's clinical diagnosis.[73] The most enlightened approach toward this controversy, however, seems to be that since such efforts to perfect computer prediction are in a true sense scholarly, they should not be scorned.[74] To do so would only repress that measure of intellectual curiosity which, to a great degree, has been the progenitor of much of that which we realize and appreciate today. I would only emphasize that for the present the lawyer's primary concern should be to encourage the development and implementation of a case law retrieval system.

To delve into existing computer applications to other law-related subjects would be an exhausting topic not within the scope of this article. Suffice it to say that computers are being increasingly utilized in the area of law enforcement; they have become the cornerstone of insurance and banking institutions; they have become a primary tool of the Internal Revenue Service; and they are rapidly becoming the sole depositories of both personal and real property records.[75] These applications, to a greater or lesser extent, involve both the law and lawyers.

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[69] Michael, Speculations on the Relation of the Computer to Individual Freedom and the Right to Privacy, 33 Geo. Wash. L. Rev. 270 (1964); Cowan, *supra* note 9, at 228.

[70] Lawlor, Analysis and Prediction of Judicial Decisions—Informal Progress Report, ABA M.U.L.L. 132, 133 (Sept. 1965).

[71] Special Committee, *supra* note 30, at 60.

[72] Wiener, Decision Prediction by Computers: Nonsense Cubed—and Worse, 48 A.B.A.J. 1023 (1962).

[73] *Id.* at 1026.

[74] Cowan, *supra* note 9, at 228.

[75] *See* Isaacs, "Crime Pattern Recognition in Natural Language," presented at the International Federation for Information Processing Congress, New York City, May 27, 1965; Kretschmann, Look at Automation Insurance, 58 Banking 89 (1965); Clarke, Electronic Brains for Banks, 17 Business Lawyer 532 (1962); Smith, Automatic Data Processing in the Internal Revenue Service, 41 Taxes 26 (1963); Smith, Impact of Automation Upon Enforcement of the Federal Tax Laws, 17 So. Cal. Tax Ins. 35 (1965); and Cook, Improvement of Land Records, ABA M.U.L.L. 107 (Dec. 1964).

Needed: A "Computer-Advocate"

No one knows what the cultural and spiritual effects of a heavily computerized society will be.[76] But one need not look far to see forecasts, some praiseworthy and others fearful.[77] Whatever the ramifications might be, the law and its spokesmen must willingly adjust to that which will inevitably come. The difficulty in adjusting, hopefully, will be slight. A thing as mystifying and bewildering to the jurist as a computer, however, will be viewed with an intuitive fear born of ignorance.[78] Such distrust or disdain must be overcome, if the law is to fully realize the significance of this machine and adapt it to its own pressing needs. The known attitudes of some leading legal educators towards computers may well be representative of the legal profession as a whole.[79] Human nature being what it is, however, even those who doubt or resist will ultimately succumb when time after time they see their computer-aided colleagues spend proportionately more time on analysis and other lawyer-like activities and less time handling dusty books.[80]

For decades the law has had one of the most sophisticated systems of information retrieval known; it has been the envy of most other professions.[81] Unfortunately, in light of the information explosion now at hand, this system can no longer serve the law adequately. The legal profession probably has no choice. If it is to retain its position of intellectual leadership, it must meet and master this great new challenge. If it does, it may find itself freed to lead society in advances that no one can now envision.[82] Life has moved so fast, so far, that it needs the computer; what life needs the law must reckon with. The motion which brought it the computer is the living force of law. By it the law too moves, and moving, lives.[83]

A new type of specialist is called for: a specialist who combines a knowledge of the field of legal information with a knowledge of com-

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[76] Cowan, *supra* note 9, at 218.

[77] Among the fearful forecasts, current speculation runs in the vein that life will become so impersonal so as to blunt human attitudes and emotions. In effect, a heavily computerized society would become the basis and means of an "Orwellian Society" with all its attendant evils and shortcomings. *See* Michael, *supra* note 69.

[78] Brown, *supra* note 3, at 248, 249.

[79] Survey, 1967-68 Problems in Legal Education, 17 Clev.-Mar. L. Rev. 194-195 (1968). Ten leading legal educators, when queried about their personal attitudes towards law school training in the use of computers, responded as follows: With some noteworthy qualifications, six of the ten responded favorably; one expressed doubt; another abstained for lack of computer knowledge; another felt that the faculty and students could easily pick up computer knowledge if it were necessary; another expressed outright scorn for the use of computers in either legal research or practice in the present state of development of computerized legal research and practice.

[80] Kayton, *supra* note 2, at 43.

[81] Stayson-Eldridge letter, *supra* note 7.

[82] Lawlor, *supra* note 13, at 344 (footnote 42).

[83] Cowan, *supra* note 9, at 254.

puter logic and capabilities.[84] The computer must have its ardent informed spokesman within the legal profession.[85] For it can become a useful tool only if the problems, nuances, and peculiar characteristics of the law are well understood in relationship to computer characteristics.[86] Working teams of lawyers and computer engineers must educate each other sufficiently so that their combined efforts can bring into being that research tool so badly needed by lawyers.[87] The lawyer must be the driving force in this relationship. Unless he makes the decisions about the credibility of computer results, unless he makes the decisions about basic computer legal system design criteria, and unless he becomes creative enough to innovate technically in a way peculiarly responsive to the needs of the law, the law will only be poorly served by computers.[88]

Fortunately, some law schools have foreseen the impact of the computer on modern society and the weighty legal implications which it imports. In so doing they have introduced into their curricula elective courses oriented toward computer theory and application in regard to the characteristics of the law.[89] The challenge thus arises because of the computer, a challenge presented not to the computer, however, but to the lawyer.[90]

In the future, lawyers who consider the interest of their clients paramount will not hesitate to employ computers to aid them in problem solving, to the extent that computer techniques are available at the time.[91] Indeed, the day will come when a computer will be as vital to legal activity as it is to general business today. The lawyer's failure to use this tool will then be somewhat analogous to writing in long-hand when there is a typewriter available.[92]

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84 Law Research Service, *supra* note 1.

85 Brown, *supra* note 3, at 247.

86 Kayton, *supra* note 2, at 7.

87 *Id.* at 43.

88 *Id.* at 42.

89 1967-1968 Problems in Legal Education, *supra* note 79, at 195. Charles Kelso, associate dean of the University of Miami Law School, in his response typified the more enlightened attitudes toward computer instruction in the law classroom when he stated:

> ". . . [I]n a few years everywhere, as in a few places today, the computer will play a prominent role in legal practice, research, and education. Thus, some law schools should actively be engaged in preparing men to fill the predictable needs for lawyers and legal scholars who can work creatively with these useful, flexible, and increasingly indispensable components of American and world technology."

90 Kayton, *supra* note 2, at 49.

91 Lawler, *supra* note 13, at 344.

92 Lyons, Computers in Legislative Drafting: An Aid or a Menace?, 51 A.B.A.J. 591, 592 (1965).