Computers and Law: Some beginnings

Computer und Recht – Die Anfänge

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Summary In the late 1960s computers and computer applications also caught the attention of lawyers. The phrase "computers and law" was coined. In the beginning, research took two somewhat different directions. One direction looked to computer technology to support legal research through information systems, through the computerisation of public administration, and through reform of systems for the administration of justice. The other direction was concerned with the issues of substantial law and the social consequences of computerisation. In the following contribution by Bing, who is one of the early researchers in Northern Europe from these first days, and who has contributed to its theory and practice, sketches the development of this interface between law and information technology, which today is known under many names, perhaps most commonly "law and information technology", "cyberlaw", "information law" etc., and a few of its beginnings in research and methods.

►►► **Zusammenfassung** In den späten sechziger Jahren des vergangenen Jahrhunderts begann man, die damals zunehmend in die Öffentlichkeit hineinwirkenden Computer auch unter dem Blickwinkel des Rechts zu betrachten. Dabei benennt das Begriffspaar „Computer und Recht" von Anbeginn an zwei unterschiedliche Hauptrichtungen rechtspraktischer und rechtstheoretischer Tätigkeit: zum einen den Einsatz von Computertechnologie zu Zwecken der Rechtspflege im Wege der Informationsversorgung, der Automatisierung der Verwaltung und der Modernisierung der Justiz und zum anderen die Beschäftigung mit den Fragen des materiellen Rechts, welche der Einsatz von Computern in der Gesellschaft aufwirft. Der folgende Aufsatz von Bing, der diese Entwicklung vom Norden Europas aus als einer der Pioniere von Anbeginn an mit verfolgt und in ihren theoretischen Grundlagen auch maßgeblich mitgestaltet hat, zeichnet die Entwicklungslinien dieser Schnittstelle von Informationstechnologie und Recht nach, die heute unter Begriffen wie Rechtsinformatik, Recht der Informationstechnologie oder schlicht Informationsrecht mit jeweils unterschiedlicher Aufgabenstellung und Akzentsetzung der Forschungsrichtungen und -methoden firmiert.

KEYWORDS K.4.1 [Public Policy Issues], K.2 [History of Computing] Rechtsinformatik, Information Law

1 Introduction

The phrase "computers and law" has a comforting, old fashioned ring. It originated some time in the late 1960s, and was a rather imprecise indication of a group of issues related to "law" and "computers". Initially, there was no strong attempt to structure the field; it was a very pragmatic approach. This is demonstrated by what may be seen as the first specialised journal to emerge for the new field of research, *Law and Computer Technology*, whose first issue was published in January 1968 by the World Peace Through Law Center, Washington DC, and which reported on the Third World Conference on World Peace Through Law in Geneva 1967, which featured an exhibition of computers and law, and a session on legal information retrieval.

"Computers and Law" has the advantage of embracing the two major branches within the field – first, computer technology used by lawyers for making their own work more efficient, like retrieval, decision support and in supporting the administration of justice; second, the substantive law applied to the trade and use of information technology and associated services. This dichotomy is basic to an understanding of the development of the field, and in the early days one would find the same persons and institutions working within both areas. Today, specialisation has separated them to a considerable degree.

The phrase "computers and law" may seem dated. There are versions of this phrase, as "Law and Information Technology" or "Law and Information Communication Technology", like in Centrum voor recht en informatica (ICRI) at University of Leuwen, Belgium, or in the rather elegant High Tech Law Institute at Santa Clara University School of Law. The dichotomy survives also in French and related languages, like in the name of Centre de Recherches Informatique et Droit, Facultés Universitaires Nôtre-Dame de la Paix, University of Namur, Belgium.

Many other claims have been made for naming this area of research. An early example is the German term "Rechtsinformatik", which is used to include both the main aspects. This is still used in the name of some institutions, like Institut für Rechtsinformatik at Leibniz University of Hanover or University of Saarbrücken, or Instiutet för Rättsinformatik at Stockholm's University.

The Italian version is also in use, like in the L'Istituto di Teoria e Tecniche dell'Informazione Giuridica in Florence.

The English version of this term – "legal informatics" – never really caught on like its counterpart "medical informatics", but is used in the English versions of the names of institutions like Institute for Legal Informatics at the University of Zaragoza (which in Spanish is called Semniario de Informática y Derecho). Reflecting technological developments, one of the new institutions at Lancashire Law School is using the phrase "law and convergent technologies", which not only includes information technology, but also nanotechnology and biotechnology.

One of the main contenders to a general term for the field is "information law", which perhaps emphasises the substantive law related to "information" – there are institutions using this in their title, for instance the Instituut voor Informatierecht, University of Amsterdam, Institut für Informationsrecht, University of Karlsruhe or Centro de Estudios en Derecho Informatico at University of Chile, Santiago.

There are also many different possibilities for variation. Harvard has its Berkeman Center for Internet and Society, which includes the Berkeman Cyberlaw Clinic, and New South Wales University has its prominent Baker & McKenzie Cyberspace Law and Policy Centre. An innovate version is the eLaw@Leiden, Centrum voor recht in de informatiemaatschappij at Leiden University.

The first book to present a course is Roy N. Freed *Materials and Cases on Computers and Law,*[1] collected for a course 1968–69 at the Law School of Boston University. The material collected is diverse, from case reports through news items to academic papers. The large A4 volume has the texture of a literary collage, but firmed up through several editions. It did have the characteristic typical of the field; of bringing together issues which only glue was the computer technology. This is also the case of another early publication – Robert P. Bigelow *Computers and the Law: An Introductory Handbook.* This is published by the Standing Committee on Law and Technology, established by the American Bar Association in 1968. These two books have come to indicate the "beginnings" of computers and law, but this is – of course – not the whole truth. As even this small paper will illustrate, there were many earlier attempts – and in Germany and Italy at approximately the same time, similar books were put together. However, the English language has secured these two early compilations a firm place not only in history, but also in the influence they have had for the developments in other countries.

They may themselves be seen as a contribution to the discussion of whether computers and law is "one" field, or one "discipline". This has been a vein running through the literature, perhaps best illustrated by Peter Seipel *Computing Law*[2] in which he with great persuasion argues that the technological part of the area – legal technology discussed in the first two sections below – are intimately fused to the issues of substantive law, and that this fusion is to be considered as one field where the parts are strongly interlinked, and that prying them apart will make it more difficult to analyse and understand. Perhaps a rather different, though related, view is that of Mads Bryde Andersen, who in his doctoral thesis on liability and computerised systems[3] qualifies what he calls "the problem of description": The systems examined for substantive law have to be analysed and understood in detail in order for the principles and terminology to be mapped onto the law. This is somewhat more than just "understanding the facts", as the systems are related to information science, and the terms used may deceive the lawyer to think they have a meaning identical to what they would have if encountered in everyday language or law. His insistence on lawyers understanding information technology sufficiently to have an independent insight for the application of law has a similar consequence.

The small survey above of some of the terms or phrases used to describe the field of "computers and law" shows diversity, and a tendency to tune the terminology to what is the current vogue in technological slang. The diversity may be an indication for this not being "one field" or "one discipline", and I will not myself venture to make any definitions. Rather, the survey will be taken for a sufficient indication of what it "all is about".

Anyway, an attempt to write a brief history of the development of this field is bound to fail. But

[1] Published by Freed, Boston.

[2] Liber, Stockholm 1977.

[3] *EDB og ansvar,* Jursit- og Økonomforbundet, Copenhagen 1988.

it is nevertheless tempting. I have therefore decided to be extremely pragmatic and be guided by my own experiences, having been part of the development since entering the field as a young research assistant in 1970. I know this brief sketch will be marred by my own perspective, my own research interests, and from being located in Norway. The reader should bear this in mind to compensate for the idiosyncratic view offered.

I have decided to unravel the history by catching hold of some threads in this rich fabric, and sketch some initial developments.

2 Let there be LITE

2.1 A retarded child and its impact[4]

In the late 1950s, a bill was passed in the legislature of Pennsylvania. Part of the bill was to change a term in the health law legislation – the phrase "retarded child" should be replaced by the more neutral phrase "exceptional child". This may seem as an example of legislative window-dressing, but obviously the amendment also indicated a new political attitude to this group of persons, and its importance should not be underestimated. There are in any jurisdiction examples of such amendments in the legislation which heralds changes in the policies within a certain area.

Pennsylvania adhered to the principle of regulatory management called "textual replacement". It dictates that any amending regulation must exactly identify which sections and sentences in the existing body of regulations should be amended. One may picture this as the amending regulation containing explicit wording which could be cut out and pasted into the specified parts of the identified existing regulations, giving as a result the new text of each amended regulation. An alternative to this principle is the "omnibus principle", where it is seen as sufficient that an amending regulation contains a section which dictates that all former regulations containing the phrase – wherever they may occur – are to be deemed amended, without specifying the relevant locations.

However, having the principle of textual replacement, the legislators of Pennsylvania had to identify where the phrase "retarded child" – or a variation of this phrase – actually occurred. This represented a tedious task, and the legislators turned towards the Graduate School of Public Health at the University of Pennsylvania for a solution. Here Professor John F. Horty had been working on a manual of hospital law, and had developed indexes to support his work at the Health Law Center. Accepting the contract, Professor Horty set out to solve the problem in the time-tested way of professors: He hired a group of students to read through the legislation and indicate all passages containing the relevant phrase. The result likewise was conventional: The professor found the quality of the work wanting. He hired a new group with an equally depressing result.

It was at this stage he turned towards the Data Processing and Computer Center, which had been established in 1955, and gained cooperation for a more radical approach: Solving the problem using text retrieval. To appreciate the boldness of this approach, one should consider the level of computer technology at this time. For the project, there were available an IBM 650, which was based on vacuum tubes and a drum storage of 2,000 words, and an IBM 7070, which was a transistorised version of the IBM 650, having a magnetic core storage containing 9,990 numbers of ten digits each. One may compare the capacity to current examples of information technology, like a digital watch or a pocket calculator. Random access memory units like magnetic disks were not available; data not placed into the central storage units mentioned above, had to be stored on sequential tapes.

In principle, the system Professor Horty developed processed an input text to create two files. One was a "text file", containing the original text with an additional index, which gave an internal address for each element of the text – like "section 2, paragraph 3 starts at location *n* on the magnetic tape". The other was a "search file"[5], where all the different words occurring in the text were sorted in alphabetical order, giving for each occurrence the internal address of the word.

The search file could be used as a very extensive index to the text itself: Looking up any term in the search file, the internal address was specified, and the computer system could use this in accessing the index of the text file, and retrieve the word in context from the text file. The user had the impression of searching the "full text"; specifying a word like "child", the system would return with the information that this occurred, for instance, in two sections of the statutory text in the data base. And if the user asked to have these displayed (or rather, printed out), they would be retrieved, using the internal addresses as the key linking the search and text files.

Sorting the words of a text in alphabetic order could be compared, perhaps, to ordering books by authors' names in a book case. Anyone who has ventured to do this will know that new books frequently have authors with last names starting with a letter early in the alphabet, requiring you to move the last books, working yourself back towards the place where a space for the new book is needed. This metaphor may give some indication of the practical problems facing the early developers. And, of course, they did not have online systems, but had to deal with batch processing, using

[4] The historical background is set out in Jon Bing et al. *Handbook of Legal Information Retrieval,* North-Holland, Amsterdam 1984, also available at http://www.lovdata.no/litt/index.html.

[5] Also known as "inverted file" or "concordance".

punched cards for input and printouts for output.

The system developed by Horty did make it rather facile to identify in which provisions of the Pennsylvania Health Law Code the word "child" and "retarded" (or grammatical variations of these) cooccurred, and the original contract could be successfully concluded. But it was rather obvious that *any* words in the stored provisions likewise and as easily could be retrieved. It is therefore justified to see this as the first successful text retrieval system, and as such it was demonstrated for an American Bar Association conference 1960. In 1963, the technology was used to build the first computerised legal information service, the LITE[6] system of the Air Force Staff Judge Advocate in Denver, Colorado. The technology also provided the basis for Aspen Systems Corporation, established in 1968, which served a large number of states in maintaining their compilations of regulations in force during the early 1970s.

There are many roads to follow from Horty's initiative. In practice, it started the development of computerised legal information services, which today are provided in any jurisdiction, and with major international examples as Reid-Elisevier's NEXIS-LEXIS service, or the Westlaw and other services of the Thompson Group. But impact on research was also major, and the two major examples are European.

But before leaving the beginning, one may indicate that though lawyers are not known for being technological *avant gardists*, text retrieval was actually developed by lawyers and for lawyers, due to the need to consult the authentic text for legal interpretation. The search engines of Internet today ripe the harvest sown by the early efforts of the legal community.

2.2 European influence

Bryan Niblett was a nuclear research physicist with the UK Atomic Energy Authority (UKAEA).[7] He spent the 1966–67 on sabbatical in California, primarily to learn about computer programming. But as he had been called to the English Bar,[8] he also spent time digging into US research in computers and law. He came across the work of Horty, and started plans for doing something similar in the UK. On his return, he has already worked out the acronym STATUS (for STATUTe Search), and determined to develop a machine independent program, which for that reason was written in a subset of FORTRAN. Having produced the first version of the program, he run into trouble – the Lord Chancellor advised the UKAEA that to put all the statutes into the system would be an *ultra vires* act, infringing the monopoly of Her Majesty's Stationary Office (HMSO) under Crown Copyright. Therefore, the system was limited to the atomic energy regulations.

The importance was not the legal service provided, but the machine independent program, which could be compiled for different computers. It provided initiatives in other institutions, and a better understanding of retrieval strategies and limitations. On this basis, activities were started in Australia, Holland and Norway. His collaborator, the former submarine officer, Norman Nunn-Price also becomes influential in the development of European legal information services, especially for the European Union.

The other major European example is Colin Tapper.[9] When working at London School of Economics 1961–65, he also became aware of the research by John Horty, and initiated studies that have become known as "The Oxford Experiments"[10], as the bulk of the work was conducted after he joined Magdalene College, Oxford (retiring as a professor). The value of Tapper's work is not only the very interesting results he provided on the design and performance of legal information services, but also the academic attitude he brought to the field. His major objective was not to get a system up and running, but to understand how text retrieval worked, and how it best could be utilised to access the source material which mainly suffered from the shortcomings of paper-based solutions: Case law. Also, he pioneered the work on using case citations for improving performance.

2.3 The legal information crisis

Above the development of legal information retrieval has been followed from the Pittsburgh initative, which mainly is driven by an interest in the possibilities inherent in the new computer technology. In Europe, however, another aspect was rather prominent.[11]

In 1970, Professor Spiros Simits published the book *Informationskrise des Rechts und Datenverarbeitung* (Karlsruhe). The main argument in this book is based on the growth of the European welfare states. Turning away from a legal policy where social benefits were awarded based on an assessment of need, the welfare states asserted

[6] LITE is an acronym for "Legal Information Thru Electronics", and it was launched 13 November 1963 under the inventible slogan *Let there be LITE!* The service was in 1975 renamed FLITE – "F" for "Federal".

[7] The paragraph is based on private communication from Bryan Niblett to the author.

[8] Bryan Niblett therefore combines the two aspects of computers and law – later he became Reader of Law at the University of Kent at Canterbury, going from there to the chair of Professor in Computer Science at Swansea.

[9] For a review of his work, see Jon Bing "The policies of legal information services: a perspective of three decades"; Peter Mirfield and Roger Smith (eds) *Essays for Colin Tapper,* LexisNexis UK, London 2003:147–158.

[10] Cf. Colin Tapper "Legal Information and Computers: Great Britain", *Law and Computer Technology* January 1968:18–19. Here is mentioned the "Office for Scientific and Technical Information" at Oxford, which was the name of the framework within which Tapper continued his work from LSE. Colin Tapper is well known for his reluctance to have his photograph taken, it is therefore with malicious pleasure noted that his portrait appears with the article.

[11] This is argued in more detail in Jon Bing "Legal information services: some trends and characteristics", Colin Campbell (ed) *Data Proecessing and the Law,* Sweet & Maxwell, London 1984:29–45.

rights for social security. This implied that a decision became legal in nature, and that an applicant could appeal. The appeal had to be processed according to the legal ideals found in how courts addressed such matters. There was a growth in specialised appeal agencies, like administrative tribunals. Also, in jurisdictions where there was a system of administrative courts, their case load increased. The appeals should be tried on the basis of the relevant legal sources. Few such sources applied to these cases apart from the prior decisions of the decision-making institution itself. Such sources were not typically included in the traditional legal publications, but were only available thorough the files of the institution. These were cumbersome to search, and consequently the time to process appeals increased.

Admittedly, this is a very crude rendering of the arguments of Simitis, but the point should be clear: There was an acute need to improve the performance of legal research in order to meet the requirements of the modern welfare state. And the solution was available in the form of legal information systems. This was strongly advocated by academic lawyers like Spiros Simitis and Herbert Fiedler[12]; and the 48th Deutschen Juristentag in 1970 recommended:

> *„Die ständige Deputation hält es für dringend geboten, über das Stadium der theoretischen Vorüberlegungen eines Einsatzes datenverarbeitender Maschinen auch für die Rechtspraxis hinaus sich nunmehr um die praktische Verwirklichung, mindestens durch die Schaffung von Datenbanken, zu bemühen, wie dies im Ausland schon weithin geschieht."*

Already in 1967, the Bundesministerium der Justiz had started planning of such a system. It is an amazing example of planning living up to the best ideals of German practice, where the administration was supported by professors like Fiedler, Simitis and Klug, ending up in a major report of 1972 – *Das Juristische Informationssystem – Analysis, Planung, Verschläge.* On this basis, the JURIS[13] system was implemented, a system still very much alive today. The first services of this system addressed social law (the decisions of Bundessozialgericht) and tax law (the decisions of Bundesfinanzhof), illustrating the point of the need to address the problems of the welfare state.

We will not dwell on the development of this service, but note that it was followed by a remarkable academic activity. In the 1970s, Germany by far was the most active country within the area of computers and law.[14] Professor Fiedler headed both Institut für Datenverarbeitung im Rechtswesen at the Gesellschaft für Mathematik und Datenverarbeitung, and Institut für Juristische Informatik at the University of Bonn. At Regensburg, Professor Wilhelm Steinmüller developed his basis for a general theory of computers and law, Professor Fridtjof Haft was active at the University of Tübingen, Professor Wolfgang Kilian established his Institut für Rechtsinformatik in Hanover etc. There are several more names that could be added to this impressive catalogue of lawyers taking an active interest in computers and law, developing its many aspects, and contributing to a rich literature.

The German example could be used as an index to what happened in many European countries. One is acutely aware of not being able in this context to even very summarily indicate these developments, but perhaps two more examples may be given.

In Italy, a similar pressure towards decisions taken by the administrative courts was felt. Here, the lead was taken by the Corte di Cassazione. Renato Borruso, one of the judges at the court, suggested a system in 1968 based on the traditional *massime* or abstracts of the decisions of the court, and the use of a thesaurus. The design of the system pursued the solutions in more traditional library-type systems, which also made it possible to realise the solution without the massive computer facilities required by the US services. The ITALGIURE-FIND system of the Centro Elettronico di documentazione of the court grew to become more than an impressive and extensive system under the inspired directorship of Vittorio Novelli, it became a driving force in Italy.

And there was a broad interest. Vittorio Frosini at the La Sapienza University in Rome had published his *Cibernetica diritto e società*[15] in 1967, in which he emphasised administrative law much stronger than in the Anglo-American literature. In 1969, Mario Losano at the University of Milan[16] coined the term *Iuscibernetica* for the field of *Macchine e modelli cibernetici nel diritto*.[17] The National Research Council established the Istituto per la Documentazione Giuridica[18] in Florence,

[12] Professor Herbert Fiedler has been very influential, and he also has a very sound basis for his work, having both a doctorate in mathematics and in law.

[13] Some confusion may arise from the use of the acronym JURIS also for the US Justice Retrieval and Inquiry System, but the Bundesministerium der Justiz consulted with their American counterpart, which agreed to the German use. The US service is now discontinued.

[14] Germany became through the 1970s the leading country in Europe with respect to computers and law, with journals and books. It is difficult to be fair in naming the pioneers, some are mentioned in the text below – but also names like Dieter Suhr and Adalbert Podlech should be mentioned. I remember brushing up – with limited success – my German from secondary school in order to take advantage of the rich literature being published at this time.

[15] Edizioni di Comunità, Milan 1967.

[16] He is currently at the University of Piemonte Orientale.

[17] Einaudi, Turin 1969.

[18] Today this institution is known as L'Istituto di Teoria e Tecniche dell'Informazione Giuridica.

which engaged in an active strategy of publications and conferences. The Corte di Cassazione started in 1976 a tradition, which was upheld for twenty years, of huge, international conferences spanning the whole width of the expanding area of computers and law, the proceedings published in several volumes.

In France, Professor Pierre Catala at the University of Montpellier in 1965 organised a working group with the objective of developing a legal information service, which in 1967 was formalised as Centre d'études pour le traitement de l'information juridique (IRETIJ). This is – as far as I know – the oldest academic institution within the area of computers and law. It was associated with the problem of accessing the decisions of the appeal courts, which were not subject to systematic publishing. IRETIJ developed a system called JURIDOC, and started documenting appeal court decisions. The system was inspired by the work of Michel Bibent, whose doctoral thesis also probably is the first within the field.[19] It may be fair to say that the efforts, especially after Professor Catala left for Paris, was somewhat drained by the needs of an operational system to the disadvantage of academic research.[20] And in Paris, there was another working party established in 1967 on the initative of Lucien Mehl, a conseilleur d'État and the grand old man of computers and law in Europe (see below). The Conseil d'État also has some functions as an administrative court, and the imitative led to the establishment of an information service which from 1970 became an independent organisation, Centre de recherches et développement en informatique juridique (CENIJ), which through a series of changing names and mergers with other services has become the current French information service, Legifrance. Though it is somewhat fuzzy, France again offers an example of the needs of the administrative law being a driving force behind the developments rather than the business opportunities which in the United States motivated ventures.

This aspect of computers and law will be left at this point. It is unfair to the developments that were to follow from this beginning – for instance the Swedish Law and Informatics Research Institute, which directed by Professor Peter Seipel became so very influential in the Nordic countries, or to the innovative Vienna system and the work by Robert Svoboda and others in Austria. It is also unfair to those institutions most active within this area today, for instance Professors Jos Dumortier and Marie-Francine Moens at ICRI, Leuwen or the Norma project at the University of Bologna. And it is even more unfair to those whose efforts even have not been mentioned. But there will be other possibilities to more fully discuss these aspects.

2.4 The Council of Europe

In Europe, the Council of Europe played an essential role in the early developments. On the initiative of the Committee of Experts on the Publication of state practices in the field of public international law, a Committee of experts on the harmonisation of the means of programming legal data into computers started its work in 1969. The longish name of the committee – and I believe no one will be offended by this – rather clearly reveals that the committee was formed without a clear understanding of its objective or the means to achieve such an objective. And the committee changed its name to the more acceptable Committee on Legal Data Processing in 1974.[21] For the rest of the century, this Committee was a central forum for an exchange of ideas and experiences with respect to computers and law. The substantive law was not part of the area for this committee – but it explored legal information services and justice administrative systems as well as teaching in the area of computers and law. Often the success of international committees is measured in the number of legal instruments adopted – the Committee certainly adopted such instruments,[22] but its main achievement was the communication it facilitated between European institutions, not only at the meetings of the committee itself, but at the annual international events, which was organised in different countries. Around the committee a loose-knit community of experts grew within public administration and universities with a strong, though informal, communication.

It is not possible to understand the co-ordinated development of legal information services in the different European jurisdictions without awareness of the exchanges taking place through the network built by this committee. The committee also strongly supported academic activity, not least through the adoption of recommendations of making introduction to computerised systems, a compulsory part of legal education, and suggesting a curriculum in the teaching of computers and law.

2.5 The Decline of Interest in Information Systems

As this small introduction has described, the interest in computerised information systems was in many ways the gateway to computers and law. It can only be properly understood on the backdrop of the crisis in the access to law discussed above. Computerised systems have indeed fulfilled their promise – though it took longer than expected – and any modern

[19] *L'informatique appliqué à la jurisprudence,* Montpellier 1972.

[20] Though Professor Michel Vivant, whose work in substantive information law is prominent, is also from Montpellier, but not working within the sector discussed here.

[21] Formally, this was a new committee succeeding the former.

[22] An example is R(83)3 on the "protection of users" of legal information services.

lawyer will be using computerised tools for legal research as a matter of course.

But the interest in the design and policy of legal information systems has declined. The tantalising possibilities of a new and untested technology no longer provide attraction to this area of computers and law. In my view, this is regrettable. There are many challenges in better understanding the relationship between substantive law and the availability of legal sources. And the systems offered today are really only jazzed up versions of the 1970 technology – the user interfaces are rather pedestrian, little use is being made of representing content or structure of legal source material using the possibilities of the new technology, and few empirical studies are conducted to teach us how the improved systems have an impact on law itself. There are exceptions – the research at the universities of Leuwen (Belgium), Bologna (Italy) and Vienna (Austria) exemplify this. Perhaps a new enthusiasm only can be kindled by a new paradigm for legal research – and perhaps knowledge based systems of a global scope may provide this.

3 Artificial Intelligence in Law

The first paper in Europe to discuss computers and law was offered to a conference at the Institut technique d'administration publique, 21 May 1957, by Lucien Mehl, the title being "La Cybernétique et l'administration". In this, Mehl discusses the problems associated with fully automated legal decisions. It may today seem somewhat premature to consider the computer as a judge at this early stage of development – but the "ghost in the machine"[23] was rather evident, one of the early contributions to the *Law and Information Technologies* raised the question "When does the computer engage in unauthorised practice?"[24]

Computers offer possibilities to explore legal reasoning by new methods. Traditionally one mentions Lee Loevinger's paper "Jurimetrics – The Next Step Forward"[25] as the start of an approach encouraging "the scientific investigation of legal problems", but he was mainly oriented towards empirical and quantitative methods related to what often is called "the sociology of law". But there was a side-track of those interested in the use of formal logic in law. This side-track actually starts some time back. George Boole, when introducing his logic basic to all computerised systems (*An Investigation Into the Laws of Thought,* 1854) chooses the following rule as an example:[26]

> *"Clean beasts are those which both divide the hoof and chew the cud."*

which he then goes on to render as a Boolean statement, and process according to the rules of his logic. A pioneer in analysing law by logic was Layman E. Allen, commencing with his paper "Symbolic logic: a razor-edged tool for drafting and interpreting legal documents".[27] In 1959, he started the journal called *Modern Uses of Logic in Law* (MULL),[28] which later was renamed *Jurimetrics Journal.*

Formal logic can be viewed as formalism similar to a high level programming language, the major difference is that a statement in formal logic cannot directly be implemented and executed by a computer. The possibility of representation of legal knowledge directly in computerised form was in the 1970s called "radical computer use in law"[29]. It was really a plea for the use of more advanced or novel methods to improve the performance of text retrieval, and the first real attempt to do this was made by Carole Hafner in 1978.[30] This was to become an area of research when artificial intelligence and law later was established, but such methods still wait to be widely deployed.[31] The papers which made a major impact internationally were based on L. Thorne McCarty's TAXMAN projects, which in broad terms may be described as experiments in artificial intelligence and legal reasoning. In these projects, the objective was by modelling a set of legal norms constituting a relatively self-contained body of law to gain insights about patterns of legal reasoning and argumentations.

Artificial intelligence was buoyed by high expectations at the end of the 1970s. The establishment of the dispersed attempts and some major projects as the area of research called "artificial intelligence and law" can be located in time to September 1979. Bryan Niblett organised an eight day workshop at Clyne Castle, Swansea,[32] in which all those active within the area participated – the objective was "to go beyond document retrieval and explore the more ambitious task of retrieving and interpreting the law itself".[33] Here the major projects like

[23] Arthur Koestler *Das Gespenst in der Maschine,* Fritz Molden, Vienna 1968.

[24] George G Lorinczi, July 1968:10–12.

[25] Reprinted in *Jurimetrics Journal* 1971:3–41.

[26] George Boole *An Investigation Into the Laws of Thought,* 1854, Chap. VI Sect. 6.

[27] *Yale Law Journal* 1957.

[28] The journal was published by the Electronic Data Retrieval Committee, established by the American Bar Association the same year.

[29] Cf. Philip Slayton "Radical Computer Use in Law", 1974, Ottawa.

[30] The work was done in 1978, documented in Carole Hafner *An information retrieval system based on a computer model of legal knowledge,* UMI Research Press, Ann Arbor 1981.

[31] A review of the field at the end of the 1980s is found in Jon Bing *Conceptual Text Retrieval,* CompLex 9/88, TANO, Oslo 1988.

[32] This is a unique conference in the memory of the author. The participants were socially brought close together, and found ways to entertain each other in the evenings. One will not forget the Schubert romances performed by Stamper, nor the solo violin of Costantino Ciampi, director of the Istituto per la documentazione giudica, Florence.

[33] Bryan Niblett "The Structure of the Course", in Bryan Niblett (ed) *Computer Science and Law: An advanced course,* Cambridge University Press, Cambridge 1980:3.

McCarty's TAXMAN and Ronald Stamper's LEGOL were presented alongside the tradition of logic in law by Layman Allen, the empirical modelling of decisions by Reed Lawlor, and the analysis of computer programs directly representing legal rules in their code, which grew out of the German interest in "Automationsgeeignete Gesetzgebung", how to draft legislation for efficient computerisation.[34]

The categories emerging from the Swansea conference were adopted and continued when the field was organised around the International Conference on Artificial Intelligence in Law (ICAIL). The first such conference was convened in 1987 at Northeastern University, Boston, on the initiative of Carole Hafner, and is still continuing as a bi-annual event, buffered by the *Artificial Intelligence and Law* published by Springer Verlag.

The area has changed many times,[35] in the early 1980s, attention shifted towards expert systems influenced by Richard Susskind *Expert Systems in Law.*[36] A distinct area is the analysis of operational systems for legal decision support, which typically is found in public administration, and which opens the analysis and discussion of the interrelationship between the legal norms presented in conventional sources and as represented in the programs.[37] Computer-assisted methods for drafting legislation, assuring for instance consistency, constitute another branch. Lately, it may seem that the interest in electronic agents somewhat has re-vitalised the field.

4 Data protection

In 1967, Alan F. Westin published his book *Privacy and Freedom.*[38] It is a remarkable book in many respects; the first section of the first chapter is titled "Privacy in the Animal World", and is followed by a section on privacy in the primitive societies, drawing on anthropological studies. It is, therefore, a book in which the discussion ranges broadly, addressing a number of rather different issues. But important is the "pressures on privacy created by the information processing revolution"[39] which are summarised in six points:

- the general expansion of information-gathering and record-keeping;
- the development of personal dossiers by credit companies, the security files of the Department of Defense, FBI, Federal Housing Administration, etc.;
- the acceleration of information gathering by computers;
- new public programs requiring more personal data;
- computer technology facilitating the sharing of data;
- the replacement of cash transactions by automatic data processing.

This small summary is offered for the reader to compare with the current issues. One will find that the concerns are rather similar to those that still are with us.

Westin's book appeared at a time when policies were formed by the possibilities of the new mainframe computers. Terminals made it possible to access computers at a distance, there were visions of data only being recorded once, and shared among federal agencies when collected, realising savings for the taxpayer. The idea of a national information system was invoked. But rather than being greeted by enthusiasm for a more efficient federal administration, the public protested. The concern ignited by Westin's powerful prose was taken further by others; another important title, Arthur Miller *The Assault on Privacy: Computers, Data Banks and Dossiers*[40].

One should consider that this was a time of deep political frustrations in the United States – the Vietnam War had divided the country, and the Watergate scandal in 1972 was by many seen as a political deceit. This was the age of the mainframes, the IBM/360 and 370 generation, displayed behind plate glass on the ground floors of industrial complexes and skyscrapers – still the first brick had to be lobbed through a window destroying the controlled atmosphere in the rooms where the computers were nursed by technicians in white coats. Privacy became a severe political concern; the plans for the national information system were shelved.

I have notes from a seminar in Paris, probably 1972, where Westin analyses the situation, finding that the cause is a reaction to power, and directed at computers as symbols of power. He summed it up in something like an aphorism: "You do not find computers in street corners or in free nature; you find them in big, powerful organisations".

This can be re-considered today, where the game arcade on the street corner displays pyrotechnical three dimensional computer graphics, or where you may come across a person on a footpath through the forest tapping away on the keyboard of his or her laptop. The technological infrastructure has changed in a dramatic way from Westin's initial analysis of the causes, but – as indicated above – his concerns as listed in his 1967 book, are still with us.

One of the important channels communicating this concern to Europe was the OECD[41]. This organisation, often referred to as the

[34] Also with respect to knowledge based systems, German research took a central position with the contribution of Herbert Fiedler (Bonn), Lothar Phillips (Munich) and Fridjof Haft (Tübingen).

[35] A review is given by Marek Sergot *The representation of law in computer program: a survey and comparison*, CompLex 1/91, TANO, Oslo 1991.

[36] Oxford University Press, Oxford 1987.

[37] The pioneers here are Cecilia Magnusson Sjöberg *Rättsautomation: Särskilt om statsförvaltningens datorisering,* Nordstedts juridik, Stockholm 1992 and Dag Wiese Schartum *Rettssikkerhet og systemutvikling i offentlig forvaltning,* Scandinavian University Press, Oslo 1993.

[38] Atheneum, New York.

[39] Alan F. Westin *Privacy and Freedom,* Atheneum, New York 1967:158.

[40] University of Michigan Press, 1971

[41] Organisation for Economic Co-operation and Development.

club of the rich countries, was established in the aftermath of the economic assistance to Europe after the Second World War, and is mainly concerned with trade issues. But as early as 1969, OECD established a "Data Bank Panel", which later was converted to the Information, Computers and Communication Policy Committee (ICCP). It is my belief that Hans Peter Gassmann, the secretary to the panel and later to the ICCP, was very influential in bringing this about. It was by no means obvious that OECD, an organisation traditionally concerned with the issues of free trade, should get involved in privacy, which many would view as a policy interest of a different nature. But national regulation protecting personal data could become an "invisible barrier to trade", as any trade implies an exchange of personal data. And with his team,[42] Gassmann brought data protection into focus. It may be argued that the international instruments that followed, which all include the consideration of free trade in goods and services, is indebted to the OECD heritage and the perspective of trade policies.

In 1970, the US adopted the Fair Credit Reporting Act, and the German state of Hesse adopted its Datenschutzgesetz, which also brought the term "data protection" into the English language. Professor Spiros Simits had assisted in drafting this legislation, and he also became a major influence in the law and policies of data protection, taking the office as commissioner in Hesse.

Such development helped bringing the policies of data protection into focus, and there were strong national activity. Sweden was the first nation to adopt a national legislation. This was by no means by chance – Sweden has the most brutal freedom of information act in existence, and there was perceived a need to harness the processing of personal data and their use.

Anecdote A small anecdote may illustrate the point. The Greek military junta made a request to the national personal register to have access to the names of Greek nationals living in Sweden. As these generally would be political opponents, one was reluctant to make this list available, and an excused based on technical difficulties was made. A few months later, it was found that a firm importing tinned foods had made the same request. The firm planned a line of imported Greek products, and wanted the list for direct mail marketing. A routine response had been given to this request, providing the list. This is, it should be emphasised not confirmed by any source, but perhaps the point is made.

The Swedish legislation was drafted by Jan Freese, who was to become an important figure on the international scene. With Gassmann, Freese coined the phrase "transborder data flows" in the middle of the 1970s. This became an important issue, as it focused on data protection as an "invisible barrier to trade". The ICCP started to consider an international instrument to address this issue. More or less at the same time, the Council of Europe, based on its tradition of human rights treaties, launched its own project. There became something of a race between the two organisations for being the first to adopt an international instrument – many of the same delegates would oscillate between the work parties in Paris and Strasbourg. The OECD effort was headed by the Australian Justice Kirby[43], who was a stern worker – he might keep the working party till after the interpreters had left, and show up the next morning with the comments of last night typed up.[44] He was helped by Professor Peter Seipel (Sweden), and the OECD Guidelines on the Protection of Privacy and Transborder Flows of Personal Data were adopted 23 September 1980. In Strasbourg, Frits Hondius was heading the secretariat, a kind and learned person guiding the project to its success by the Convention for the Protection of Individuals with regard to Automatic Processing of Personal Data adopted 28 January 1981.

At this time, most – but not all – European jurisdictions had national legislation. Those which sanctioned the Council of Europe treaty, also agreed not to use data protection as an argument for regulating trade between them. But if a member country itself exported personal data into a third country not bound by the treaty, other members could argue that this would put the protection of personal data at risk, and then regulate the export. During the 1980s, the European Union strongly promoted the internal market, and urged member countries to sanction the Convention to remove data protection as a potential trade barrier within this market. Member countries, however, hesitated, and the Commission decided to adopt a Directive, which would put the matter at rest – if member countries did not adopt the directive, it would eventually be directly enforced according to EU law.

The negotiations for the data protection directive started in 1990, approximately ten years after the adoption of the first international instruments. It turned out to be a drawn out struggle for the directive to find its final form, and it was only adopted in 1995,[45] indicating in its title that one of the objectives

[42] Which included Klaus Lenk, now professor emeritus at Carl von Ossietzky University of Oldenburg, and G Russell Pipe, who went on to publish the influential Transnational Data and Communications Report (TDR) 1978–1994.

[43] Later to become president of the Australian Supreme Court.

[44] The author draws on his personal notes, being a Norwegian delegate to the OECD working party.

[45] Directive 95/46/EC of the European Parlament and of the Council of 24 October 1995 on the protection of individuals with regard to the processing of personal data and on the free movement of such data.

was the "free movement" of personal data.

One will easily appreciate that the years from 1990 to 1995 was critical in the development of the infrastructure of information technology. In 1990, Tim Bernes-Lee was permitted by CERN to start programming the new version of his 1980 program Enquire Within Upon Everything, the project being given the name World Wide Web. In 1993, Marc Andreessen released the first version of his web browser, Mosaic, which made the web more easily accessible, and the web pages rich in graphics. In 1995, Digital Equipment Corporation launched Alta Vista, the first search engine based on text retrieval principles. In the five years the EU was negotiating over the directive, the world in which the data protection principles should be implemented changed in a dramatic way – one may dare to talk about a new paradigm.

Therefore, we still have a situation in which there are numerous research issues and practical challenges to data protection – ensuring that this continues to be a rather lively field.

5 Copyright and information technology

One of the more curios early copyright cases is White-Smith Music Publishing Company *v* Apollo Company.[46] The case concerned the copyright to two "plantation lullabies" to which White Smith had the copyright. Apollo was a company manufacturing pianolas, mechanical devices which would play the piano from "musical rolls … of perforated sheets, which are passed over ducts connected with the operating parts of the mechanism in such manner that the same are kept sealed until, by means of perforations in the rolls, air pressure is admitted to the ducts which operate the pneumatic devices to sound the notes". The issue was whether these rolls were a "copy" of the musical work in the meaning of the US (1907) Law. The court held that it was not: "These musical tones are not a copy which appeals to the eye."[47] This case was subsequently eclipsed by Congress's intervention in the form of an amendment to the Copyright Act of 1909, introducing a compulsory license for the manufacture and distribution of such "mechanical" embodiments of musical works. This was not a solution of what Michael S. Keplinger referred to as "The Case of the invisible copies".[48] It is rather trivial to observe that if a sheet of perforated piano rolls were not "pleasing to the eye", the same would hold for punched cards or tape, not to mention the magnetic storage media which were introduced.[49] And the basic problem in the US copyright law had still not been solved – though it represented no problem within many other jurisdictions.

When jointly revising the copyright acts of the Nordic countries in the late 1950s, the definition of a copy was extended to include "any device on which the work is stored". Originally this was to include sound recordings on magnetic string, but computerised devices were easily absorbed.

In the 1960s, computer programs were considered as accessories to the very expensive computers. There were several reasons for this, one that programs simply could not be run on any other computer than for which it was written, high-level languages were still in the making[50] and compatibility was low. But IBM had considerable success with its 360-series, and decided in 1969 – perhaps somewhat stimulated by the anti-trust suit to which it was party – to unbundle hard- and software. As computer programs were separately priced, it became possible for third parties to offer competing programs. And in such a market arose the obvious issue of the protection of computer programs.

At this time, it was still unclear to what extent the US Copyright law applied to computer programs. There were several court decisions, the copyright and patent systems competing for becoming the legal framework for the intellectual property protection of computer programs. There were also strong advocates for a third possibility, a *sui generis* regime for computer programs, as it was pointed out that neither copyright nor patent was designed to accommodate the special features for protecting computer programs.

Anecdote The author will be permitted an anecdote by the way of illustration. At one of the meetings of experts[51] to the WIPO in Geneva[52], there had been an unusually heavy snowfall during the night. Struggling uphill to the WIPO building, one could see improvised tools being used to remove the snow in order for cars to escape from their parking lots. In the meeting, the head of the delegation of Soviet Union[53] made this into a metaphor pleading for a *sui generis* solution, "In Geneva, where the snow rarely falls, one may allow oneself to adapt the tools at hand for the removal of snow. If you live in Moscow, you will expect the snow to fall heavily every winter, and you will

[46] 109 US 1(1907).

[47] Justice Holmes remarks, "On principle anything that mechanically reproduces that collocation of sounds ought to be held a copy, or if the statute is too narrow ought to be made so by a further act, except so far as some extraneous consideration of policy may oppose." However, he did not formulate a dissident opinion, and his implied advice was followed only 70 years late.

[48] *Revue Internationale de Droit d'Auteur*, October 1970.

[49] Probably first used by Mauchly and Eckert 1946 in their first attempt to produce a computer, which eventually was named UNIVAC.

[50] The first version of COBOL was adopted 1968 by American National Standards Institute.

[51] Advisory Group of Governmental Experts on the Protection of Computer Programs.

[52] February 25 – March 1, 1985.

[53] Vitaly Troussov, Deputy Director of the Patent Examination Department, USSR State Committee for Inventions and Discoveries

have efficient and specialised tools. And I ask you, ladies and gentlemen, do you think computers are like the snow in Moscow or in Geneva?"[54]

In 1971–77, WIPO actually developed "Model provisions on the protection of computer software" with the assistance of Professor Peter Seipel (Sweden), but these were not adopted as national legislation in any country. The model provisions were inspired by copyright, but had some elements akin to patent protection of the content of programs. In practice the discussion of alternatives came to a halt when the US adopted the 1980 amendments to the 1976 Copyright Act, extending copyright protection to computer programs. A country was free under the conventions of qualifying programs as literary works, and this made it possible nearly overnight to establish an international scheme of protection, based on the Berne and Universal Copyright Convention.

The interest in copyright was nearly exclusively limited to computer programs. For these there was a market, and there were strong commercial interests in protecting programs. This interest also found different strategies for protection; one was to introduce various devices which had to be present for the program to be executed, like an extra element for the serial plug to the printer which then was called by the program, which failed to initiate printing if the element was not found. This was the beginning of technical protection measures, the discussion of which later has escalated. Another obvious measure was only to make the program available in object form, which in turn gave rise to the doctrine of and provisions on reverse engineering in order to make it possible to develop programs functionally interacting with another program. A characteristic of copyright is that the protection allows anyone to access the information in the protected work, and use this information in the creation of new and independent works. The practice of making programs available in object form only, barred the access to the information, and reverse engineering may be seen as a reaction to this for copyright somewhat alien aspect.

There was some interest in other aspects. A joint WIPO and UNESCO[55] of 1982 concerned the "problems arising from the use of computer systems for access to or creation of works". In the recommendation it is stated that for instance uploading of a protected work to a computerised systems represents a reproduction in the terms of the conventions. The use of computers to create work attracted some attention, at this time composers would use computer programs as tools, and the recommendation[56] also states that this is the perspective in which to consider such use.

However, there were considerable limitations in computerised systems at this time (1982) for a real concern about the use of literary, musical or audiovisual works to be considered for computerised systems. The IBM PC had been brought out the year before, the first model did not have a hard disk, but only 5 1/4 inch floppy disks (and they really were floppy). Storage was still expensive. Only with low storage costs the volumes of data involved for storing protected works could be considered. In the early 1980s, the emphasis was on programs and the special type of programs used for gaming in the first low cost specially designed consoles brought out for the lower end of the consumer market. Also, infrastructure had to develop for the establishment for a market for protected works. This did not happen until the early 1990 as summarised above. These developments shaped the Web, and at the same time created the potential for a market in protected works which legal policies still are unfolding, and which promise an interesting future for the law of intellectual property related to information technology.

6 Conclusion

This paper started with an apology, and should end with one. It is a collection of loose ends, and no coherent presentation of the emergence of computers and law as a field of academic research or legal practice. In fact, this still has to be decided – though it may be convenient to bundle legal issues related to information technology together, it is still for the author uncertain whether this is for pragmatic reasons or for an underlying coherence of methods, knowledge or problems. To explore that question, an investigation needs to be much more in depth and in width than this paper permits. However, it is hoped that such future investigations may find some morsels which are relevant in this collection of recollections, anecdotes and documentation.

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[54] One will find a reference to this intervention, though stripped of the images, in the report of the meeting paragraph 22, UNESCO/WIPO/GE/CSS/3 8 March 1985:4.

[55] UNESCO is the depositary to the Universal Copyright Convention.

[56] Art. 14.

year) 2002. Knight of the Order of St Olav First Rank (awarded by King Harald V 1999).

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