Documentation in Legal Informatics and the «International Bibliography on Computers and Law»

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I. DOCUMENTATION IN LEGAL INFORMATICS AND COMPUTER LAW

1. Delimitation of the Discipline and Subject Matter Identification: Problems of Definition and Methodology

1.1. Objective Problems

Since its beginnings, over thirty years ago, legal informatics has developed at an astonishing speed, involving aspects and fields of law where, only a few years ago, the spread of the new technology would have been inconceivable. These two factors — the rapid and continuous progress in the discipline and its ever widening and deepening influence — are however at the basis of the disorientation and uncertainty which, if on the one hand even today hinder a thorough and consistent framework of the subject matter, on the other are witness to the provisional and incomplete state, in which many research projects find themselves.

Above all, in the emergence of legal informatics as an autonomous discipline, the solution of concrete legal problems represented the principle objective of research. Individual researchers (or groups of researchers) engaged in the carrying out of particular projects, frequently connected with the needs of categories of legal operators or sectors of the Public Administr-
ration. The lack of coordination between the various undertakings and the considerable fragmentation in their practical application, at least in certain aspects, can be considered both the symptom and the cause of insufficient documentation, with useless duplication of expensive efforts as an inevitable consequence and with the serious risk of an involution in research 1.

If this situation could have gradually been remedied, above all by the creation of specialized study centres and by starting national and international co-ordination programmes, the total dependence of research in and applications of legal informatics on developments in technology, understood both in the narrow sense and with reference to the use of different and interacting methodologies, must be increasingly acknowledged. Developments in this direction today are no longer happening within spans of time which would allow for a gradual and total assimilation of new knowledge and its implications. On the contrary, the quantity and specificity of notions to apprehend and evaluate during the life span of a technological innovation are so great that the legal informatics expert (while intent on advancing scientific achievements and their applicative potential) often remains disoriented, when not actually constrained to assert views which are already outdated.

The highly accelerated rhythm of the technological revolution produces, in turn, a chain reaction by creating new specializations in which knowledge is «parcellled» in an exasperating way, reintroducing the need for a harmonious and productive synthesis. In this respect legal informatics has – not only in the eyes of the layman but also for the expert himself – the appearance of a field of knowledge in rapid evolution and increasing specialization, but for that reason with problems in defining its limits which, for the most part, have still to be confronted. In this context it is, on the one hand, sufficient to refer to the rapid succession of computer ‘generations’ and the significant development in software and, on the other hand, to the deepening of knowledge in the most varied fields, which applications of the new technology made possible, to the point where true autonomous disciplines arise which, in turn, are connected through an intercepting and interacting network certainly far from easy to control (as it has happened, for example, in robotics, artificial intelligence and automatics).

Besides this, another phenomenon is to be found, which in some way is even more apparent and serious in its consequences. This is the multiple and often not clearly defined relationships between legal informatics and various other disciplines, such as the more recent ones – cybernetics and information science – and numerous others, going back over time, consolidated by centuries of cultural tradition – such as philosophy and logic.

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1. For analogous considerations on this phase in the evolution of legal informatics and, at the same time, of the bibliographies on the subject, see M. G. Losano, Gisicibernetica. Macchine e modelli cibernetici nel diritto, Turin, Einaudi, 1969, p. 27-31.
With regard to the former, there are no texts collecting together, clearly and concisely, the fundamental principles which characterize them. This means that it is almost impossible to have an exact idea of the criteria which govern their development in the various applied fields. With regard to the latter, the technological revolution in progress – in particular, the influence of the computer as a catalyst for large interdisciplinary research – has, in part, used their systems of analysis and methodology and has, in part, upset their schemes and structures. The new disciplines which general informatics has originated have already given tangible and important results in the widest range of applications, but, as soon as the general developed methodologies are considered as well as the mentality with which their problems are posed and solved, it is easy to realize that they will exercise an increasingly wide influence not only over other not strictly technical disciplines, but, even more generally, on the cognitive processes and activities of mankind. Concerning the complex interrelationship between informatics and traditional disciplines, it is only possible to mention here the multitude and variety of levels at which they become intertwined, in an exchange of achievements, techniques and methods where the contribution of informatics cannot be reduced to a merely instrumental role.

The evolution and expansion of legal informatics, the fragmentation and lack of coordination in research, the substantial dependence of theoretical formulations and practical implementation on technological progress, the progressive and rapid specialization within general informatics to the point that some of its sectors have turned into autonomous disciplines, the variety and complexity of interrelationships between legal informatics, on the one hand, and the humanities and technological disciplines on the other are only some of the reasons why the creation of a current bibliography on legal informatics is still an extremely delicate and difficult undertaking.

1.2. Subjective Problems

If what has been illustrated so far is able to explain many uncertainties in the manifest heterogeneity of the documentation proposed and in some apparent contradictions in selection, an undoubted importance must also be given to a variety of subjective factors, resulting from both the personality and education of the editors and user needs and expectations.

Generally speaking and at the level of approximation to which the previous comments refer, a specialized bibliography on legal informatics inevitably shows traces of its editors' education and cultural experience both in its general formulation and in the development of its various sections. In particular, the possibility of interdisciplinary contacts, which are not just superficial, and a regular and efficient cooperation network, which is both geographically extended and scientifically representative, serve to minimize the risk of an incoherent bibliographical selection, attentive only to de-
velopments in fields where electronic data processing has traditionally been applied.

In this sense the fundamental debate on the definition itself of legal informatics (and, more generally, of informatics) in the forms conceived by the various experts in the field and, consequently, by the editors of bibliographies relating to it, can therefore still be considered current or at least certainly not out of date. As it is obvious, in fact, the conception the editors have on the limits of the subject matter directly influences the type of information they consider opportune to provide.

The necessity—and at the same time the difficulty—of adopting a clear and precise definition of the discipline as a reference point in a bibliographical activity increases considerably when dealing not with a definitive but with a periodical bibliography and, still further, when dealing not with a thematic but a general bibliography. In the first instance, in fact, the novel and provisional character marking the systematization of the various bibliographical contributions must be taken into account when viewing legal informatics in both its historical aspect and as a discipline exposed to the unpredictability of technological progress. In the second instance, dealing with a new discipline in rapid and continuous evolution, the definition of its limits must be regularly revised and updated. However, if the systematization proposed must take into account the vast number and incidence of concrete applications and the complexity and richness of theories, it must also sacrifice the unity of its composition to developments and contingent conditions of specific research areas.

These complex problems—which on their own could constitute the subject for further study—are reflected in the terms selected for depicting the discipline as a whole or in its principle sectors. It is not so very long ago that authoritative texts dealing systematically with the subject made direct reference to computers and their applications in the legal field, explicitly refusing to use expressions and concepts which had still to gain general consensus in scientific discussion.2

2. On problems of definition and methodology in legal informatics and on the uncertainty surrounding even the name of the discipline, it is possible to have a sufficiently clear idea by consulting the following general reference works on the subject matter.

From the vast amount of literature published, for Italian studies see: M. G. LOSANO, Gia


For the documentalist working on an international bibliography which must be continually updated – without going into the matter here – remains the big problem of choosing and collecting scientific papers labelled in different ways by their authors, not only because of their geographical and cultural areas, but sometimes merely in homage to a passing scientific fancy. From ‘legal cybernetics’ to ‘jurimetrics’, from ‘juscybernetics’ to ‘legal in-


formatics’ and ‘juritechnics’ 3 – not to speak of the particular subdivisions within the discipline understood as a whole (‘metadocumentary legal informatics’, ‘justcybernetic modelling’, ‘deontic systems’, ‘legal automata’, ‘artificial intelligence in law’, etc.) – the papers present to the experts in the field as well as the documentalists who try to record them a vast and articulate scientific panorama, often not definable in a clear and unequivocal manner. The now numerous terminological choices – sometimes one following the other in time and sometimes coexistent – and the conceptual definitions which justify them have succeeded in highlighting different issues not only in legal informatics but also in its methodology. Nevertheless, although usage within the legal, political and technical worlds has ended with an at least partial selection of the terms proposed, even from the bibliographical point of view it must be admitted that a generally accepted definition of legal informatics still does not exist. In fact, legal informatics shares in the achievements and technology of numerous disciplines, without it actually being possible to establish how far the new methodologies deriving from it are completely autonomous with respect to the sciences from which they originate.

A few brief comments on user needs and expectations must be added to the influence which the subjective factors described have on the formulation and organization of an international bibliography on computers and law. Here it is advisable to distinguish not only between laymen and experts, between theoreticians and practitioners, between legal informatics experts, politicians interested in informatics and specialists in computer law, but generally also between those who are interested in any way in the applications of currently existing legal informatics technology and those instead who are engaged in putting these techniques into practice. It is clear that the taking into account of this aspect – although it comes within the limits indicated by the legal order for the application of informatics techniques to the law – widens the selection criteria for documentary material, with the danger of an indiscriminate extension to strictly technical disciplines, even falling outside the theoretical interests of legal operators. The bibliography risks becoming confused, heterogeneous, disordered and, in the end, even random. It certainly increases in size but its usefulness diminishes proportionately.

Cybernetics, philosophy, logic, mathematics, electronics, information and documentation sciences and also various other sciences certainly related to

informatics have their own bibliographical tools. Moreover, also within informatics itself—as has already been mentioned—entire sectors and even single theories have developed so much that they require and justify the compilation of separate bibliographies. Similar comments could be made about the applications of computer technologies not just to law but also to other fields, from biology to medicine, from the humanities to social and political sciences, from the productive and commercial sector to that of banking and insurance.

Even these extensions of the bibliography pose delicate and complex problems for the documentalist. If, in the first place, a rigid restriction of the consolidated themes in legal informatics gives a static image of a discipline which is, instead, in continual evolution, in the second place, the age-old difficulty of defining the law by marking its boundaries—along with the added complication of having to take into account publications produced in countries characterized by different or even opposite cultures, ideologies and legal orders—may often be said to favour the enriching of the documentation.

However, the possibility remains for both hypotheses of identifying valid points of reference, even if they need periodical testing.

For the disciplines traditionally outside informatics or those arising out of informatics, the documentalist engaged in defining his field for investigation may decide, when dealing specifically with the law, to accept only those contributions which are linked non-implicitly or non-potentially to the theoretical and practical aspects of legal informatics taking into consideration its particular interdisciplinary nature. In each case the document selected should fall into the intersecting zone between sets which can be quantitatively and qualitatively different each time, but which must nevertheless include informatics (or one of the independent disciplines derived from it) and law (understood, however, in its widest and most comprehensive sense). It is clear that in time these intersecting zones between different disciplines (that is, between themselves and between them and legal informatics) are destined to multiply and spread. Nevertheless a not improper division of specialization requires scholars or researchers often to venture into uncertain and unexplored territory, only recently opened up to human knowledge, but still unknown to legal operators. It comes, instead, within the documentalist’s tasks merely to record at the right moment the stages of this journey, without uselessly seeking to venture into it or to mark its trails.

With regard to applications of computer technology to non legal sectors, user needs and expectations of a specialized documentation service ought to be specified, above all, in relation to considerations of a practical and functional nature. From this point of view, it can be said that unequivocal limits to the bibliographical selection arise out of the utility in comparing actual applications in different scientific spheres but in similar situations (a
significant and well-known example which comes to mind is the problem of medical diagnosis compared with that of judicial decision-making).

From another point of view, the documentalist’s choice will be confined to those computer applications which appear to be the natural and necessary extension of specific legal applications (as for example, the use of computers in linguistics or in education, with respect to legal linguistics and legal education). Finally, the relevance of several other fields of application derive directly from the position which they occupy in relation to the law, with reference to the particular nature of the subject (political parties, trade unions, pressure groups, etc.) or of the activity (banking, credit, accounting, insurance, management, etc.). As to the latter, even if there are substantial differences between the various legal orders, some have, at least in part, been taken over by the modern State (transports, territorial planning, environmental protection, etc.).

1.3. Subject Matter Identification

From the survey of the difficulties, both of an objective and subjective kind, which may be encountered in defining the field of interest for an international bibliography on legal informatics, the impression emerges however that the brilliant results achieved in numerous sectors of this discipline do not correspond with an adequate reflection on the general direction of the research itself. The vertiginous rhythm of scientific and technological progress over the last few years propels the legal operator’s efforts to understand and assimilate, sometimes forcing him to reject established mental conceptions and, very often, to review attitudes and principles for a long time considered unchangeable.

Organic investigation into the subject matter, in this context, is rapidly outdated not only in relation to the basic information but also, in part, with regard to the general theoretical framework. Hence, in following technological advances which are becoming more and more sophisticated, the need to confer a satisfactory order on the research as a whole is lost sight of, while terms and concepts on which no general consensus has been reached in scientific discussion continue to be used.

Deferring the assessment of this problem and those most closely associated with it (such as the analytical examination of research methods in a field which is so highly interdisciplinary) to a separate investigation, the specific identification of the subject matter in the setting up of an international bibliography on legal informatics is understood to be indicative and, of necessity, open to periodical revision. On a general and preliminary level, the numerous applications of computer technology to law, on the one hand, and, on the other, the new problems of a legal, political, sociological, economical or educational nature which resort to the same technologies has caused, will be enucleated.

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Arising out of this fundamental division the following may be seen: 1) as having epistemological introductory functions – the theoretical, systematic and terminological questions and questions about the boundaries of the discipline which are laid down in relation to legal informatics understood as a whole; 2) as having selective-integrative functions – those applications of computer technology within organizations, activities and sciences which, while not included within the central nucleus mentioned, are related or relevant to it; 3) as having functions preparatory to future research – those new advances in informatics, documentation and information sciences which are of interest to the legal operator specialized in legal informatics.

More specifically, applications of computer technology to the law can then, in turn, be organized systematically around an ordering criterion which takes into account the interested party (public or private), the activities carried out (differing from subject to subject) and the kind of application which has been introduced into that activity (documentary, managerial and decision-making).

Legal problems arising out of informatics come within the traditional branches of the law (international, constitutional, administrative, etc.), while an analytical provision of specific headings must instead be reserved for more important issues which are emerging, such as data security and protection. Finally, legal problems will be placed alongside problems of a sociological, political, economical and educational nature, connected not only with legal informatics but also with automation in general.

2. Leading European and American Bibliographies on Computers and Law

In the analysis of theoretical problems of definition and methodology illustrated in the preceding paragraph, it is appropriate to list here – for a useful and direct comparison – a brief but indicative survey of the leading bibliographies on computers and law being published currently in Europe and USA.

2.1. Periodical Bibliographies

a) Informatique et sciences juridiques

This is a journal published twice annually, since 1978, by the Centre de Documentation de Sciences Humaines of the French CNRS. Besides the bibliographical section, the journal includes two columns. News of conferences and of study meetings on legal informatics are given in the first, called Actualités, while in the second, Chronique, studies and discussions are published. The themes covered deal, in general, with the impact of informatics on society and therefore include the legal, political and sociological
issues raised by new technologies, as well as informatics studies and applications relating to the law.

The bibliographical section is processed electronically, enabling it to provide lists of various kinds, which render document retrieval easier. Information may therefore be chosen according to numerous criteria:

— typology of documents: periodicals, books, university papers, reports, proceedings, laws and court decisions;
— authors (meaning physical persons);
— organizations: as producers of documents, or as objects of specific studies;
— concepts: alphabetic list of keywords used to identify the contents of documents;
— countries: geographical entities or international political and economic groups.

The information in each of these lists is identified by a number which refers back to the section called Analyse, where all data specifying the document (author, title, bibliographical details and abstract) is reproduced.

The bibliographical material is organized into eight major classes:

1) Generalités;
2) Logique et jurimétrie;
3) Problèmes juridiques;
4) Recherche documentaire;
5) Expérience;
6) Enseignement;
7) Problèmes politiques et sociologiques;
8) Aspects économiques.

The sources are indicated at the beginning of each issue and, as far as journals are concerned, include about 40 titles.

The data collected for the publication of the bibliography is regularly fed into a data base and therefore the Centre de Documentation des Sciences Humaines is able to supply documentation relating to specific topics in three different forms, according to the needs and the type of questions put by users. In fact, it is possible to make a retrospective search going back to 1974 or a periodical bibliographical search (the data base is searched twice a year and permits the user to have information regularly) or yet again a conversational query with the help of a researcher in the group managing the data base.

b) Rutgers Journal of Computers, Technology and the Law

Rutgers Journal of Computers, Technology and the Law has since 1969 included the publication of a specialized bibliography on legal informatics, appearing as a regular column in each issue of the journal, which is pub-
lished once every six months. The bibliography is arranged in a systematic form, but does not supply diversified lists, so that data can only be searched by subject matter. On the other hand, it must be stressed that the classification table is properly organized. Each heading is specified up to the third level, permitting profitable research and a satisfactory selection.

The author, title and bibliographical details are indicated for each bibliographical unit. No abstract is given.

The classification table contains the following headings:
1) Computer Usage in Law Practice;
2) Computer and the Government: Use and Regulation;
3) Legal Issues of Computer Sales, Usage and Services;
4) Computer and Business;
5) The Computer in Selected Areas and Industries;
6) Computer and Legal Reasoning;
7) General Articles, Surveys, Bibliographies and Computer Law, Developments in Foreign Countries;
8) Computer Sciences and Selected Technological Developments of Potential Significance to the Legal Community.

c) Karlsruher Juristische Bibliographie

A special section on legal informatics appears regularly (quarterly since 1982) in the Karlsruher Juristische Bibliographie, published monthly in the German Federal Republic and concerned with material in the field of law and sociology.

The main topics of the bibliography are distributed in 18 separate sections and correspond to the matters which come under the jurisdiction of two Courts (the Constitutional Court and the Federal Court of Justice) where the editors work as librarians. At present there are about 650 publications, among journals and series, which are selected and made available immediately after they appear, irrespective of their country of origin. This also applies for single issues, miscellaneous works and proceedings of conferences. A list of the journals cited is annexed at the conclusion of every volume.

The bibliography is structured systematically and contains the bibliographical details of the documents, but no abstract. Lacking a typological index, books are indicated by underlining the reference number and by inserting a «+» sign before the title. Only the author index appears. A general author index and an index of the subjects dealt with are published at the end of each volume.

The section referring to legal informatics is identified by No. 17 and is organized according to a classification table containing the following headings:
Legal Informatics and Legal Information Science:

1) In General;
2) Documentation in General in Law and Public Administration;
3) Automation in Law and Public Administration;
4) Other Applications of ADP and other Information Technologies;
5) Data Protection, Privacy, Data Security, Social Implications;
6) Information Law;

d) Computer/Law Journal

So far only bibliographies of a general nature covering the various fields generally understood to be contained within the expression «legal informatics», even though in very different forms, as to quality and quantity, have been cited. However, monothematic bibliographies relating to specific issues within the discipline also exist.


The cited bibliographies are presented in different forms and are not organized under specific classification tables.

The bibliography edited by M. D. Scott was published for the first time in 1979, in the third issue of Volume I (1979) of Computer/Law Journal and later reprinted, unaltered, in an independent form. The material was grouped in the 19 classes indicated below:

1) Overview of Computers and Computer Law;
2) System Design;
3) System Procurement;
4) Government Regulations;
5) Tort Law;
6) Privacy;
7) Criminal Law;
8) Constitutional Law;
9) Evidence;
10) Procedure and Discovery;
11) Corporate Law;
12) Labour Law;
13) Computer Use in the Legal Profession;
14) Computer Use in Government;
15) Computer Use in Industry;
16) Taxation;
17) EDP Audits;
18) Jurimetrics;
19) International Law.

Because of the rapid development in computer and telecommunication law, the second edition of the Computer Law Bibliography under the new title of Computer Law Reading List – once again edited by Scott – was published shortly after (in 1982). This second edition was updated, while entries which had ceased to be of interest, were deleted.

2.2. Retrospective Bibliographies

a) Applications of Computer Technology to Law (1969-1978), A Selected Bibliography

In the sphere of non-periodical bibliographies, an important work is that of the Canadian Law Information Council. Published in 1980 and edited by E. Kozak, M. A. Foster and S. A. Louder, it appeared as a special number of the Law/Technology journal. It covers the period from 1968 until 1978 and contains entries without abstracts.

The Canadian Law Information Council has promoted many projects relating to the application of computer technologies to the law and has recently established a special Documentation and Research Centre. This Centre is, among other things, engaged in regularly updating the bibliography, whose contents correspond to what is available in the library of the Centre.

The bibliography – according to what the editors say in their introduction – is made up of entries relating to the use of computers in the law with particular reference to legal research, judicial administration, property registration and to the simulation of legal reasoning. The editors were not, however, interested in documenting fields relating to computer law, criminal law information systems, technologies and scientific methodologies applicable to the law. Traditional legal research manuals and guides for users of particular legal information systems were also excluded.

The Classification Table adopted is divided into the following sections:
1) General Works Related to Computer Applications in Law;
2) Computer Assisted Legal Research/Information Retrieval;
3) Litigation Support;
4) Law Office Management;
5) Court Administration;
6) Legislative System (Procedures);
7) Land and Property Registration,
8) Other Applications (Artificial Intelligence, Legal Reasoning, Estate Planning, Tax Research, Historical Research);
9) Lawyer/Computer Interface.

Data search within the bibliography can be made either by subject matter or by author. Another two lists are also included, one containing descriptions of legal informatics projects and operating systems and the other relating to the geographic names recurring in the documents collected.


This is a retrospective bibliography aimed essentially at the English reader, whether he be a law practitioner, a legal scholar or a documentalist. The Society for Computers and Law, the editor of this bibliography, gives, as a motivation for the work, the need to cite studies above all by English authors in order to challenge the considerable dependence on North American literature which has undoubtedly occurred during the last few years in the field of legal informatics. The bibliography, according to its introduction, contains entries without abstracts, relating to the applications of computer technology to law from 1969 to 1981. It does not, however, document computer law, notwithstanding the marked developments in this field.

The material is organized into general classes with their related subclasses, specified to the fourth level. The entries are in chronological order and appear alphabetically by authors. There is only an author index. The sections into which the bibliography is divided are indicated here as follows:

1) General Works Relating to Computer Applications to Law;
2) Computer Assisted Legal Research (CARL) / Information Retrieval;
3) Artificial Intelligence and Legal Reasoning;
4) Legal Education and Training;
5) Court and Legislative Systems;
6) Land and Property Registration;
7) Computers in Litigation and the Judicial Process;
8) Law Office Management.

Among the appendices which complete the bibliography, the one citing online data bases containing data important to the law is of particular interest.
II. The «International Bibliography on Computers and Law»

1. General

The International Bibliography on Computers and Law includes works belonging to a specific discipline; therefore it is a specialized bibliography in the traditional sense of the word, with the distinction, however, arising from the special problems of documenting new sciences, in which the proliferation of research works has not met with any definitive clarity in their overall structurization.

The documents included are carefully selected on the basis of their relevance to the subject matter covered by the International Bibliography, but no distinction is made between contributions of a strictly scientific nature, articles of an informative kind or commentaries which are obviously directed towards a wider category of readers. The International Bibliography is therefore selective with regard to the content of the documents but not to the kind of treatment or the form of presentation given to it.

Right from the beginning, furthermore, its scope has been not only to draw attention to publications but also to give information about their content. Besides the bibliographical details of each document, in fact, a brief summary in English of its content and several descriptors are given. It is therefore analytical as well as a descriptive bibliography.

As far as the general lay-out is concerned, the International Bibliography has been given a systematic order. The bibliographical units are ordered logically, according to their subject matter, using particular codes, assigned manually, applying the universal decimal classification system, suitably adapted. A keyword index and an author index referring to the main index have been added as improvements and integrations.

With reference to its intended purposes, the International Bibliography is oriented towards a user group which may broadly be termed as scientific and, as far as possible, international. The international character of the Bibliography is connected with at least three types of considerations: firstly, sources cover various geographical areas; secondly, foreign documentation centres assist in the collection and analysis of data; and, finally, the selection of the material itself is made taking into account scientific and practical interests which extend beyond the local level. As a consequence, on the one hand, all details relating to the graphic and editorial presentation — which would have been important for a different user group — are omitted in the description of the documents and, on the other, English has been chosen as

4. Only recently the editors of the Bibliography have introduced the distinction between printed publications and grey literature by adding the letter «G», corresponding to «grey literature», to the codes referring to the typology of the documents. See R. NANNUCCI (ed.), BID Rules, Florence, Istituto per la documentazione giuridica del CNR, 1983, 4th ed.
the main documentary language in the translation of the title, the compilation of the abstract and the selection of descriptors. In the same way, English cataloguing rules have been used in the transcription of the documents' bibliographical details.

The International Bibliography edited by the Istituto per la documentazione giuridica di CNR (Florence) began appearing in 1975 as a periodical bibliographical list, published at close intervals. Since it aims to give notice of scientific advances as soon as they occur in pertaining fields, the International Bibliography can be considered current as well as periodical.

While deferring a description of the methods and techniques employed in the collection, analysis, processing, organization and dissemination of the data included in the International Bibliography until later, another of its fundamental formal characteristics will be concentrated on here. This is the use of electronic data processing and automated phototypesetting of the text. These modern techniques which scientific and technological progress has made available, if, on the one hand, impose a significant modification of the procedures used in preparing the data, on the other, they allow for a considerable widening of possibilities for retrieval and consultation of stored material.

The role the computer plays in the preparation of the International Bibliography differs for each of its three lists, from the Keyword Index (which is a KWOC index with keywords printed in alphabetical order as headings) to the systematic Bibliography (in which the documentary material is automatically organized according to a specially-designed decimal classification table) and to the Author Index (where the names of the authors are set out in alphabetical order, with the titles of their respective works).

With regard to the International Bibliography in printed form, the integration between electronic processing and phototypesetting allows to produce printed matter with all the graphic and editorial qualifications necessary for an easy and profitable reading. In practice, it makes available all the symbols used in the writing of the most important languages (special signs, accents, etc.), the various styles of typographical type faces (Roman, italic, light, boldface, etc.) and a great variety of paginations.

As is well-known, the importance of the computer in developing, managing and querying the International Bibliography's on-line data base comes within the sphere of information retrieval.

To summarize what has already been explained, the International Bibliography on Computers and Law can be defined as a bibliography specialized, selective, signalling, analytical, systematic, scientific, international, periodical, current, processed and phototypeset by computer, retrievable on-line.

At this point, it may be specified that, right from beginning, the idea of developing a new bibliographical instrument was related to that of setting up and increasing a specialized section on informatics and its applications
to the law within the library of the Istituto per la documentazione giuridica. At present, this section contains 3,000 books and 200 scientific periodicals, numerous photocopies of documents, besides various general and specialized bibliographies, library and publishers' catalogues, single and non-written documents. Editing of the International Bibliography is in fact closely connected with the management and increase of the library. So, through this interrelationship and with the accessibility to data permitted by the simultaneous development of the correspondent on-line data base, the International Bibliography has increasingly become a fundamental element in the establishment of an articulate and complex Documentation Centre.

2. Scope

The scope of the International Bibliography on Computers and Law has become progressively more specific and specialized over the years, following a logical evolution in which both the developments of the disciplines involved and the trends of studies and research are adequately reflected.

In the Bollettino bibliografico d'informatica generale e applicata al diritto (whose ideas and experiences have, to a large extent, been picked up and developed by the present International Bibliography) contributions relating to applications of computer technology to law in the field of information processing were recorded, whether they were general or theoretical or concerned with actual or potential applications in fields other than law. An evaluation as to whether or not the citation of a document would be of some interest to legal operators was made almost exclusively on the basis of the nature of the data subjected to electronic processing – data which, of necessity, must be not numerical. On the other hand, literature relating to political, sociological and legal issues in informatics, being scarcely developed as yet, were excluded from the Bollettino.

In comparison with the Bollettino, the scope of the International Bibliography is in one way narrower and, in another, wider. In fact, it specifically records all those documents relating to the application or applicability of

5. The «Bollettino bibliografico d'informatica generale e applicata al diritto» was published quarterly by the Istituto per la documentazione giuridica of Florence, in 1971, '72 and '73. Since 1975 the same Institute has edited the journal «Informatica e diritto», of which the International Bibliography is a part.
6. For a comparative evaluation of the subject matter and the systematic organization of bibliographical material collected in the issues of the «Bollettino» and the International Bibliography, respectively compare the Schema di classificazione, published in no. 1/2 (1973) of the «Bollettino», and the two versions of the Classification Table, published in nos. 3/4 (1975 and 1977) of the Bibliography. The Classification Table used at present for the International Bibliography is published in «Informatica e diritto», VIII (1982), p. 385-394, while the Italian version of the same Classification is in C. CIAMPI, E. FAMELI, G. TRIVISONNO, THES/J/BID. Tesaurus d'informatica e diritto, Milan, Giuffrè, 1984, 709 p., «Informatica e ordinamento giuridico, 2». 
computer technology to law and to the organization of the State, as well as to the problems of a legal, sociological, political, economical or educational nature, caused by the impact of that modern technology. Consideration of the various uses of informatics extends from documentation to management and decision-making. The fields in which it is possible to apply computer technology in these three ways are, in turn, defined, by referring to the traditional tripartition between making, application and enforcement of the law («Automation in Parliament», «Automation in the Public Administration», «Automation in Judicial Administration»).

On the general level of the matters described here, only a brief note needs to be added on legal documentation, to which a particular historical importance in studies on legal informatics now has to be attached. Law as the subject of documentation must be considered in a very wide meaning, including, not only legislation, case law, legal literature and customs, but also the many kinds of data directly relevant to the law (such as data collected by the registry office, fiscal data, legal certificates, notarial acts, standard contracts, etc.).

3. Evolution of the Bibliography. A Retrospective View

The idea of developing, at the Istituto per la documentazione giuridica of the Consiglio Nazionale delle Ricerche, a bibliography on informatics and its applications to the law goes back over many years. The first issue of the Bollettino bibliografico d'informatica generale e applicata al diritto was published, in fact, in a provisional edition, in December 1971. It was followed six months later by a second issue (in its definitive edition), in which the bibliography – having gone beyond of mere disseminating of information taken from the regular analysis of the material collected in the section of the Institute's library specialized in the subject – also began citing data acquired through collaboration with organizations and scholars from outside the Institute. It had, already by 1972, become a periodical publication which, directing itself essentially to an Italian reading public, added to the description of the bibliographical details a number of annotations, including, in particular, the translations into Italian of foreign titles and an indication of the main arguments dealt with in the documents through the use of appropriately selected keywords.

Whilst not wishing to give here a detailed history of the evolution of the Bibliography, it seems important, nevertheless, to draw attention to several substantive and structural aspects of its subsequent development. The most obvious point of reference was, without doubt, the transition from the original Bollettino bibliografico d'informatica generale e applicata al diritto (1971-’73) to the present International Bibliography on Computers and Law (1975- ), periodical publication which is complementary to the journal de-
voted to the same themes, even though it has a quite separate typographical format.

The new title adopted was intended to express the editorial decision to redefine the fields covered by the Bibliography, corresponding to the evolution which studies and research on the subject were undergoing and reflecting the user needs, which were becoming increasingly specific and actual. The analysis of the systematic framework in which the collected data is placed in the Bollettino and the International Bibliography, even before evaluating the contents of the two publications, demonstrates, on the one hand, the gradual process of clarification and demarcation in the boundaries of legal informatics and, on the other, a rapidly increasing multiplication within it of specialized sections regarding theoretical and methodological research as well as concrete and practical applications. The mention in the Bollettino of general informatics indicated that general or theoretical studies on information processing and contributions concerning applications which had been or could be carried out in fields other than law (with the single exception of problems relating to theoretical premises or actual implementations) were included in it. With the wideness of the field encompassed by general informatics clashed the still small nucleus of topics strictly belonging to legal informatics. These gravitated mostly towards problems of documentation, relating both directly to the law (legislation, case law, legal literature) and to data important for the law (certifications, registrations, transcriptions, etc.) Studies specifically coming within the framework of ‘jurimetries’ in its strict sense (that is, the science which purposes to develop theories and to verify hypothesis in law using statistical and mathematical techniques and methods), as well as those relating to computer law (understood as a set of legal problems arising out of computer applications and new communication techniques) were excluded from the Bollettino.

Deferring to a subsequent paragraph (4.4.) an analysis of the topics covered by the International Bibliography under the present Classification Table, it is sufficient here to observe that, while, on the one hand, not only legal but also political and social problems arising out of the application of new technologies (legal, political and sociological issues in informatics) have received adequate attention, on the other, the theoretical and technological aspects of information and data processing have been included only when they bear a direct relationship to the central themes of legal informatics.

7. See note 2.
8. See the Introduzione by C. Ciampi to the «Bollettino bibliografico d'informatica generale e applicata al diritto», I (1972), 2, p. ix.
10. See C. Ciampi, Introduzione, cit., p. ix.
11. See the table in four languages of the Fields Covered by the Bibliography, at the beginning of every issue of the International Bibliography, and the Presentazione by the Executive Committee in the first number of the journal «Informatica e diritto» (1973).
As already outlined above, the changes introduced in the definition of the areas of interest for the International Bibliography are reflected in the systematic organization of the material collected, which has moved gradually from a mere formal ordering of data (connected with the typological differentiation between the documentary units, divided into Abstracts, Documenti, Notizie and Recensioni in the issues of the Bollettino which appeared during 1972) to a precise arrangement according to subject matter, worked out on the basis of a specially-prepared and up-to-date classification table.

Similarly, the typology of the documents was modified and enriched. The four categories cited above and used in the Bollettino of 1972 were substituted in 1973 by a distinction between books («libri» - «L»), understood as works of over 100 pages published in autonomous form), miscellaneous («miscellanea» - «M»), volumes containing articles by different authors and proceedings of conferences), booklets («opuscoli» - «O»), separately printed or duplicated publications of up to 100 pages) and periodicals («periodici» - «P»), articles published in periodicals.

With time the description of data became more accurate and comprehensive. The cataloguing rules first used were those of the countries where the selected documents were published (in the issues of the second year of the Bollettino). They were then substituted by those commonly accepted in the English-speaking countries (beginning from 1975).

As far as the analysis of the bibliographical material is concerned, the description of the essential contents of the documents by specially selected keywords was substituted, beginning with the first issue in 1973, with a brief summary from two to ten lines in length, designed to indicate to the user whether or not he has better read the text in full. With the transition from the Bollettino to the International Bibliography, the international orientation given to the publication prompted the substitution of Italian with English as the main documentary language, both for the translation of titles and in the compilation of abstracts as well as in the selection of keywords.

Finally, the techniques and methods for organizing, processing and printing the data have constantly been refined, adapting to the progress made in recent years in electronic data processing and printing.

In both the volumes of the Bollettino and the International Bibliography the material is organized in three lists, interconnected by reference codes. They

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12 See note 6.
are the Keyword Index, the Bibliography and the Author Index. Correspondingly, the specially-prepared data is submitted to different kinds of processing, according to the organization set down for it.

Only the issues of the Bollettino published during its first year used, for the compilation of the Keyword Index, a standard program of the KWIC (Key Words In Context) type, which scanned and analyzed the titles of the bibliographical units, with their relative translations and subject words, building, on the basis of a contrast with the list of stop words, a series of printed lines arranged according to the alphabetical order of the significant words.

With the first issue of 1973, the KWIC indexing technique was substituted by the KWOC (Key Words Out Context). In this type of index the keywords no longer appear within the line of the text but are printed as head, in the left-hand margin of the page and above the complete titles of the documents to which it refers. Furthermore, the index is processed by referring to a preconstructed list of particularly significant words and expressions («Go Words»), instead of on the basis of «Stop Words».

With the transition from the Bollettino to the International Bibliography, the KWOC technique was retained but English terms were substituted for those in Italian 14. Finally, in 1982, a thesaurus of terms relating to legal informatics and computer law was completed. Organized in numerous lists, it is an attempt to standardize the specialized language developed in these fields, serving to orient the user to the conceptual organization of the individual descriptors 15.

An important innovation in the printing of the data was introduced in 1973 when, while continuing to produce copies of the computer printouts in offset, it was decided to use a print chain with a greater number of characters and, more importantly, capable of distinguishing capital and small letters. Of even greater importance still, in this sector, was the transition to experimentation with and then adoption of phototypesetting in the first issue of the International Bibliography (1975) 16.

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14. For more analytical information on the development of the bibliographical undertaking see, by C. Ciampi, the Introduzione in no. 2 (1972) and the Avvertenza in no. 1/2 (1973) of the «Bollettino», cit.
16. For information on the use of this technique in printing the International Bibliography, see infra § II, 4.5.
In the history of the evolution of the work, its international character merits separate consideration. In the first place, the Bibliography is international because it tends to document literature of world-wide importance to legal informatics and computer law. Furthermore, it is, along with the journal «Informatica e diritto» in which it is printed, directed towards scholars and experts in all the countries represented in it. And, finally, the bibliographical analysis is carried out with the cooperation of foreign Documentation Centres, qualified to cover the most important geographical areas 17. Evidence of the first contacts with other organizations already appeared in the title-page of the Bollettino in 1973, where the Norwegian Research Centre for Computers and Law of the University of Oslo and the Institut de Recherche d’Informatique Juridique of the University of South Paris were cited.

In 1975, the international organization became more comprehensive with new agreements for collaboration in the International Bibliography being concluded in the meantime. Besides the two foreign Documentation Centres already mentioned, the Dokumentationsstelle für Information und Recht (DOSIR) of the University of Regensburg 18. Colin F. Tapper of Magdalen College of Oxford and Héléne Bauer-Bernet, director of the Service Juridique de la Commission des Communautés Européennes de Bruxelles began collaborating with the International Bibliography. The DOSIR, directed by Wilhelm Steinmüller (University of Regensburg), having access to an extensive network of correspondents, documented publications from Eastern Europe as well as German-language literature. The CNRS took over from the Institute directed by Buffelan (see Table 1).

In a further reorganization carried out in 1982, the DOSIR was substituted by the Documentation Centre directed by Werner R. Svoboda (member of the «Computer and Law Society»), located in Vienna and responsible for the analysis of bibliographical material in German. Documentation for Eastern Europe is now carried out directly by Vladimir Vrećion (Charles University of Prague), while the Norwegian Centre continues its cooperation. Responsibility for documentation from the English-speaking countries has been entrusted to Deirdre Exell Pirro (European University of Florence), while agreements regarding French materials have not yet been concluded (see Table 2).

17. At present not all geographic areas are represented, in part because of the differences in dissemination of the new computer technologies and in part because of the difficulty in acquiring information. See infra § II, 3.
Table 1 — Organization of the International Bibliography on Computers and Law (BIU). Documentation Centres — 1975
Table 2 — Organization of the International Bibliography on Computers and Law (BID). Documentation Centres — 1982
4. Tools and Procedures for Data Acquisition and Preparation

The creation of a bibliography of the kind described here involves a series of complex operations and each of these, in order to carry out exactly its function, demands a precise definition of criteria and methods. The following paragraphs describe the various phases necessary in preparing the bibliography as a whole together with reference to the procedures and tools identified.

4.1. Data Acquisition: The Sources

The choice of the source material is an important moment in the dynamics of the organization of a bibliography. In fact, the more carefully the material for scanning is collected and selected, the more scientifically valid the bibliography will be. In order to achieve this aim, it is, first of all, necessary to have tools designed to assure a constant updating of the overall scientific literature published at an international level. Therefore, the first phase is to identify the most suitable means for achieving this result, taking into account that there are several difficulties due to the considerable development over the last few years in the literature on legal informatics.

4.1.1. Typology

Two main trends in periodical publications have become apparent: the increasingly frequent throw on the publishing market of new periodicals presented as specialized sources of legal informatics and, at the same time, the introduction of special columns in already established journals, as proof of the growing need to give adequate space to the studies and debate on legal informatics.

Although these publications may, even if to a different extent, be considered as specialized in the subject matter, there are also a considerable number of periodicals which, while giving priority to other aspects of informatics in general, sometimes deal with the applications of informatics to law or with legal problems raised by informatics.

Finally, other less numerous publications, classifiable as newsletters and published by various organizations (private associations, universities, industries, local public bodies, etc.), deal with many aspects of legal informatics even if in a more varied and concise way. These publications make an important contribution to the identification of the present state of research, whether completed or still being planned. At the same time, they highlight the multiplicity of problems deriving from different interdisciplinary approaches. A total of about 180 journals have been selected for the International Bibliography.
Apart from books, booklets 19, proceedings of conferences and congresses, collections of articles and essays, other types of documents included are research contributions of organizations, public bodies, institutes, universities, foundations, etc. and, in general, all material within the category of so-called grey literature. This last category of publications poses particular problems due to the enormous variety of contributions which can be classified as grey literature and to the difficulty in getting hold of them by using traditional bibliographical channels. Only some of them, such as reports presented at congresses but not published, reports containing scientific and technical information for the public and private sector, articles published in some journals which are out of the commercial circulation, official documents edited by government agencies and university theses, will be quoted here 20.

The means used to identify such documents can only be direct. However these means are often inadequate because of the spread of the practice of producing scientific and technical literature not destined for publication nor for a wide commercial circulation, but whose rapid circulation at a limited cost needs to be assured, even if, in this way, it is necessarily more limited. Certainly, the development and the dissemination of advanced and versatile technical means, such as offset presses, electrostatic photocopying machines, automatic typewriters and word processors, have contributed to this trend. Recently, the Commission of the European Economic Community has also dealt with this problem and has proposed the creation of a system called SIGLE (System for Information on Grey Literature in Europe) for information retrieval on grey literature in Europe. This project foresees the setting up of special national centres for information acquisition 21 which, being in contact with those bodies producing this type of literature, will constantly supply material for a data bank accessible on the DIANE/Euronet network 22.

Specialized series on legal informatics which some Italian and foreign publishers have begun publishing are among the documents included in the International Bibliography as well as specialized ‘progressive’ 23 publications.

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19. According to P. Bisogno, *Teoria della documentazione*, Milan, Argeli, 1980, p. 36-37, the term «opuscolo» (booklet) can be used for printed works held together because of their small number of pages with staples or similar devices, while reference to their content remains uncertain and ambiguous. Generally, however, «opuscolo» is used to indicate a publication of only a few pages, containing information, propaganda or advertising.


21. In Italy the work will be taken on by the Istituto di studi sulla ricerca e documentazione scientifica of the Consiglio Nazionale delle Ricerche.


23. In the *International Bibliography* those research contributions of a scientific nature, of organizations, public bodies, institutes, etc., which, programmed for continuing publication or
and series of general interest for legal informatics which the European Community and various international organizations, such as UNO and UNESCO, have founded and distribute. Once more, these initiatives confirm the growing interest in this topic from different cultural spheres and, therefore, at differentiated research levels.

Secondary sources must be added to publications belonging to the categories already described, which may be considered as primary sources. These include bibliographies, publishers' catalogues and on-line bibliographical data bases. Research carried out in order to identify sources for the International Bibliography lead to the selection of about thirty bibliographies and abstract journals, some one hundred publishers' catalogues and five on-line bibliographical data bases. Almost all of these are European and American, because there are still difficulties in acquiring information from other geographical areas.

In particular, the consultation of on-line data bases through the terminals linked to the Italgiure System of the Italian Corte di Cassazione and to the Automated Documentation Centre of the Italian Chamber of Deputies enriches the source material considerably, above all as far as newspapers, current affairs periodicals, as well as books and monographs are concerned. At present, the following data bases are regularly consulted for the International Bibliography: the «Bibliografia Nazionale Italiana - Italian National Bibliography (BNI/BIBL)» data base, managed by the National Library, Florence, including citations of all works published in Italy since 1975; the «Dottrina e Dibattito giuridico - Jurisprudence and Legal Debate» (DOTTR/DOCT) data base of the Istituto per la documentazione giuridica of the Consiglio Nazionale delle Ricerche, in which bibliographical units, containing the abstract of articles published in Italian legal journals since 1970, are stored; the «Reperitario Bibliografico Straniero - Foreign Bibliographical Catalogue» (REBIS) data base, comprising the bibliographical details of the books held at the Library of Congress, Washington, with particular reference to publications issued in English speaking countries.

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24. The data bases which have been used for the International Bibliography up until now are exclusively those of the Italgiure System and of the Italian Chamber of Deputies. With the development of the European network Euronet it will also be possible to search other legal and bibliographical data bases set up in other countries and, at present, not accessible to the Istituto per la documentazione giuridica. Ref. Atti del Convegno DIANE/Euronet: la rete comunitaria di informazione e documentazione in linea (Rome, April 10-11, 1980), Rome, Edizioni dell'Ateneo, 1981, 188 p.

25. The double abbreviation given for each of the two data bases cited in the text is due to the fact that they are available both on terminals linked to the Electronic Documentation Centre of the Italian Corte di Cassazione and on those of the Automated Documentation Centre of the Chamber of Deputies.
and to works of interest for a parliamentary bibliography; the «Riviste - Journals» (RIV) data base, including the bibliographical details of the Italian legal journals which publish the full texts of the «massime» (digests), comments about judgements and legal articles; finally, the data base of the periodicals held in the Library of the Italian Chamber of Deputies (RIVI), where bibliographical cards of all articles published in Italian and foreign journals available in the Library are stored.

On the basis of the typology described above, the sources have been organized in eight different lists: a) periodicals mainly containing articles on legal informatics; b) periodicals concerned, in general, with informatics as well as information and documentation sciences; c) newspapers and newsletters; d) series and ‘progressive’ publications edited by national and international bodies or institutes working in legal informatics; e) periodical bibliographies and abstract journals; f) publishers’ catalogues; g) on-line data bases; h) periodicals containing articles of interest to the International Bibliography which have been found by scanning other secondary sources.

4.1.2. Screening Procedures

The work necessary for identifying the bibliographical sources was divided into several stages. First of all, the lists of the sources already prepared for the Bollettino and for the International Bibliography were analyzed. A preliminary selection from these lists was made discarding all those periodicals which dealt mainly with general informatics and documentation without any reference to the law. In fact, these periodicals had previously been included in the list of sources as, at that time, the boundaries of the subject matter were extremely uncertain and the number of specific publications devoted to it throughout the world was very small.

The situation regarding current publications instead has changed radically. Now further research and practical experience in this field have permitted a clearer identification of the limits of the discipline, even if some uncertainties still remain because of its strongly interdisciplinary nature. The evolution of the specialized literature has represented the different directions taken by research. Thus the list of the source material itself is a demonstration of the scientific progress achieved. In fact, it includes about thirty new periodicals which deal specifically with legal informatics.

The choice of new periodicals for scanning required the use of different tools, such as international inventories of periodicals and publishers’ and

specialized library catalogues. In this way, the real extent of the literature developed over the last few years has become evident. However, this constant progress makes a transitory selection phase necessary because it is impossible to analyze satisfactorily those new publications which are often available only in a few copies even to an organized documentation centre. For these reasons, it seemed appropriate to adopt a particular selection criterion: the most recent publications which could, on good grounds, be considered important both on the basis of the publishers' advertising and on the analysis of the first issues have been included in the list, but they are submitted to a careful evaluation of their contents for at least one year, in order to check if they are relevant and important enough to be included in the final list of sources for the *International Bibliography*.

As far as secondary sources are concerned, their selection required lengthy preparatory work which was carried out in two stages. First of all, the most important international periodicals containing bibliographical details about new informatics technologies and about their use in the various applicative sectors were singled out. After a detailed analysis of the relevant classification tables, the quantity and quality of documents produced relating to subjects of specific interest were then evaluated. The introduction of this kind of publications, allowing the retrieval of data of various types coming from different sources, proved to be extremely useful. Among other things, it was possible to cite important documents published in legal journals not directly scanned because of their considerable number and because they only occasionally include contributions relevant to legal informatics or computer law.

Obviously, the source lists prepared under these procedures can be considered neither complete nor definitive. They will be constantly changed because of the many and various events in the life of a journal, a publishing house, an institute or a public body, due not only to internal reorganization, but also to the ripening of different interests among those responsible for a publication, as well as among experts in the discipline.

4.2. *Data Selection*

The analysis of sources and the selection of documents represent one of the most delicate and decisive moments in the entire preparation of a bibliography. In fact, the choices made during this phase by the editors, considered as a whole, determine not only the consistency of the information reproduced, but also its relevance and actuality. Therefore, it seemed appropriate to give the task of selecting data to those who are not only documentation experts, but who also possess a fundamental knowledge of legal informatics in general. This is so also because, even if in this field it is possible to formulate abstract rules to which one must conform, their right
interpretation is connected with the experience and sensitivity of those who actually carry out the bibliographical analysis.

Naturally, the decision on the selection of a document depends on the document content and, therefore, on an evaluation of its relevance to the topics set out in the Classification Table. As for the technical language recurring in the specialized literature on the subject matter, the specially-prepared Thesaurus is not only an attempt at standardization, but also at systematic organization; therefore, it can be considered, even if only indirectly, as another useful aid for the documentalist engaged in analyzing the relevance of the data to be collected.

Selection difficulties are, on the one hand, connected with the fundamental problems concerning the definition and organization of legal informatics (considered both as a single theoretic discipline and as a heterogeneous set of many concrete technological applications), while, on the other hand, they arise out of (or they are, at least, definitely accentuated by) the inevitable subjectivity of the evaluations expressed by the numerous collaborators involved in such a complex bibliography.

The main criterion formulated as a guide for the selection of the material to be included is based on the detailed comparison between the contents of the documentary unit analyzed each time and the single analytic or general headings of the Classification Table. However, this criterion is specified, even if approximately, in the identification of a double level of relevance in the data to be selected regarding the central themes covered by the International Bibliography. The first level refers to theoretical and applicative aspects of legal informatics, as well as to the legal, sociological, political, educational and economical problems arising out of legal informatics and automation in general; whereas the second level considers practical applications and scientific developments in fields and disciplines significant to the legal community.

The use of this selection rule, as it is functional to the gradual concentration of bibliographical material on the matters which are certainly relevant to legal informatics and of significance to its scholars, has also led to the application of a different level of documentary analysis. For documents judged more relevant (coming within sections from 0. to 4. of the Classification Table)

27. Under the present organization of the International Bibliography, the data selection is done personally by the directors of the external Documentation Centres and by the coordinators of the Editorial Board.
28. In order to select the data, THES/BID places at the documentalist’s disposition the Class list in which the terms in the Thesaurus, belonging to each heading of the Classification Table, are listed alphabetically, followed by reference to other classification codes under which they are grouped in the same way. With the publication of editions of the Thesaurus in Italian, French, German and Spanish, the use the documentalist will be able to make of this instrument even in the preliminary phase of selecting relevant bibliographical material will be considerably widened.
29. See infra § 1. 11.
tion Table used for the systematic organization of data), the citation is completed with a brief summary (or abstract) of their contents 30, without taking into account the typology of the source scanned.

Only for newspapers and newsletters (which, even if they usually do not include strictly scientific articles, have an essential function in updating and circulating information) the complete analysis of the data was appropriately subordinated to the requisites of its more central relevance to the subject matter and of the presence of other secondary features, such as currency and the fact that the news reported is not of exclusively local importance. Documents dealing with matters not directly concerning legal informatics and computer law (classifiable under the headings from 5. to 8. of the Classification Table) are submitted to different rules according to the various types of sources taken into consideration, even for only their citation in the International Bibliography. They must be not highly-technical, but of general interest and easily comprehensible to legal operators. Data included in newspapers and newsletters is an exception, as it is not even cited unless it comes within the category of data considered of particular interest for users 31.

4.3. Data Description and Analysis

The description and analysis of the data selected from the bibliographical sources take on particular features in a bibliography which is not only computer-based as printed publication, but is also periodically transferred onto magnetic tape and can therefore be consulted as an on-line data base.

Numerous operations regarding the phase of preparing the collected material become more difficult in comparison with traditional bibliographical work simply because, right from the very beginning, the use of the computer requires scrupulous and constant adaptation to precise criteria of order and uniformity. In particular, it is necessary, on one hand, to program all the work on the numerous results which may be obtained by using the most recent techniques and, on the other hand, to base the activity on an effective and constant collaboration between the bibliography’s editors and the data processing technicians.

For this reason, the rules for the description and the analysis of data prepared for the International Bibliography reflect not only the specificity of the subject matter documented, but also the needs of the computer itself.

Beginning with the description of the various elements relating to each document, one can identify the necessity of a specially-prepared medium

30. See infra § II, 4.3.
for simplifying data acquisition and reproduction, as well as its ordered input into the computer storage. The pre-printed form which has been created is the result of long experience in this field. In fact, a type of form has gradually been prepared, which allows data to be transcribed employing a normal electric typewriter with the corresponding interlineations in current use. A pre-established section on the form corresponds to each element in the description of the document. A different code was also given to each section, thus allowing for, in the further processing of the data, a wider development in selection and extraction on a numeric basis (systematic order connected with the classification codes) or an alphabetical basis (Author or Keyword Index).

In general, there are three types of information written on the form: the material description of the document (type of document indicated with a letter, bibliographical details) \(^{32}\); the description of the document content (author, title and subtitle, indication of the source language) and the analysis of the document (classification code, abstract, keywords).

Other secondary information does not directly regard the form or content of the documents, but is useful for the various processing procedures to which they are submitted, as far as both the printed publication and the possible methods for consulting the on-line data base are concerned. The same is true for the identification number of the single bibliographical units and for the code of the Documentation Centre from which they come. The former is assigned taking into account the suitability of giving an order to the material, even within its particular systematic organization, by referring to obvious criteria for its grouping together (according to the journal title, year, issue, progressive number of the pages within a journal or a miscellaneous work, etc.). The latter does not appear in the printed publication, but allows for the formulation of statistical tables, such as those published in the bibliographical issues since 1977 (Table of Documentation Units Produced by Each Documentation Centre and List of Periodicals Reviewed).

Regarding more specifically the three types of information identified, it is sufficient here to draw attention to some particular choices which the general structure and the scientific orientation of the International Bibliography have determined.

Thus, in the material description of the documents – as already mentioned above – it seemed neither opportune nor necessary to give detailed information of interest only to particular users (for example: format, binding, price, presence of tables, diagrams, graphs, appendices, etc.); on the contrary, it was considered essential to point out, in a sufficiently formal and exact manner, where each document belonged according to a pre-established typology. This is because, within a rapidly and constantly evolving

discipline which is far from being systematically consolidated, researchers and experts have reason to be most interested in non-traditional kinds of literature, ranging from the study of an unknown researcher to the official report of a well-known scholar.

Similar comments are valid for data included in the bibliographical references. The citation of the publisher and of the place of publication is directed towards the document's retrievability, as well as (even if indirectly and approximately) to the weight of its contents, while the year of publication points out the up-to-dateness of the work in relation to the scientific development and technological progress of the period to which it refers. These evaluations are generally valid, but it has to be specified that each differs in importance when it is expressed within a discipline whose literature is, even now, extremely scattered, without basic reference works and, to a large degree, subject to a very rapid aging process, due to progress in knowledge and increase in implementation. The number itself of the pages, even if obviously it cannot be considered indicative of the scientific value of an article, will often be sufficient to show the level of the contents, as well as of the complexity of the topic discussed.

Among the bibliographical details of non-independent documents, the most important thing to point out is the title of the journal containing the article described. Even in this field, legal informatics has its own particular problems, as it often happens that ordinary journals with a wide circulation publish articles of scientific value or even devote monographic issues to current and complex matters, above all about computer law and informatics policy.

The citations of the author, editor, title and subtitle in the description of the document content present many and varied problems, but usually the solutions adopted follow current rules of librarianship.

Some particular choices are justifiable, here also, because of the features of the discipline being dealt with. The names of the authors (who are not yet numerous, but are often little known even among experts, due to the multiplicity of their possible geographical and cultural origins) are written in full, whilst particular care is given to searching for the most up-to-date techniques in copying the spelling of different languages correctly (Czech, Danish, Esperanto, French, English, Italian, Dutch, Norwegian, Polish, Romanian, Russian, Spanish, Swedish, German and Hungarian). All diacritics are reproduced exactly (from the various types of accents to the diaeresis, the tilde and the cedilla), whereas possible prefixes or suffixes follow surnames and names respectively.

Above all, however, it was necessary to establish precise rules in cases - happening very frequently within these documents - when the author or the editor is a public body, an institute, an institution, a university, a research group and the like, or legislative, administrative or judicial bodies.
As far as the title and subtitle, as elements of the document description, are concerned, the comments already made largely apply, from the importance given to their exact transcription in their original language to the necessity of citing even non-conventional documents, such as information reported in newspapers and newsletters (which often has no real title). The correct English translation, which it was considered appropriate to add after the different language titles, is a consequence of the international character of the Bibliography.

The analysis of the documents is basically expressed in the abstract, which is a brief description, always given in English, of the content of the bibliographical unit; it is only added to citations which are strictly relevant to legal informatics and computer law, since, with regard to these matters, the International Bibliography should be not only as exhaustive as possible, but should also give a clear idea of whether the original document is worth reading. Experience suggested making the abstract conform to precise criteria concerning both formal expression and the information contained in it.

As regards the former, rather than telegraphic expressions devoid of syntactic structure, the use of natural language was preferred, expressed in simple but completed periods, where possible formulated in an impersonal way, carefully avoiding "empty" words or words with little significance, useless adjectives and redundances. Brevity (essential for adapting the richness of the material to be documented to the need of creating tools which may be easily and effectively consulted) must go together with clarity but without sacrificing the information content. For this reason, the documentalist's aim is towards reaching (within a limited, pre-established number of words) a balance between the length of the original document and the incisiveness of its summary. Particular attention should also be paid to the technical terminology recurring throughout the vast and heterogeneous literature on legal informatics and computer law. The fluidity of this terminology, the many uncertainties and significant linguistic problems involved are already being studied and certainly need further specialized research. THES/BID is an indispensable reference work for the documentalist engaged in the analysis of the pertinent technical and scientific literature; nevertheless, even though binding for the indexer, it is only considered as a useful guide when writing the abstract 33. A strict limitation of the terminology employed in it does not correspond to the strongly evolutionary phase characterizing the fields of research involved and producing ter-

33. In order to index the bibliographical material, the documentalists collaborating on the International Bibliography are required to use only permitted descriptors. However, they may also submit proposals for new words or expressions, used in English-language documents and referring to concepts which do not appear in the Thesaurus. In the abstract, on the contrary, the same terminology used in the original document may be used more liberally. On this point see R. NANNucci (ed.), BID Rules, cit., p. C26 ff., C35 ff.
minological phenomena not easily adaptable to the rules of specialized lexi-
cons. Moreover, any form of a priori crystallization of the terminology
developed within distant geographic and scientific environments would
surely be risky, particularly with regard to the general theoretical aspects
and the spread of interdisciplinary integrations in the carrying out of re-
search. Finally, because of the dual function which the International Bib-
liography on Computers and Law has taken on (for promoting data dissemi-
nation not only through the traditional means as a printed publication, but
also by using the most modern computer techniques), the possibility of en-
riching the potentiality for the retrieval of information using keywords in
the on-line data base without limiting the choice to those included in the
special thesaurus cannot be disregarded.

The abstract is considered so capable of providing information that it may
actually be qualified as a self-sufficient secondary document. It seems
reasonable that the contents of the abstract comply with criteria which
reflect the summary distinction between theoretical and speculative con-
tributions on one hand (where, above all, the abstract has to stress prob-
lems, solutions and methods) and articles concerning experiments and ap-
plications on the other (where the main information which should be found
in the abstract concerns the subjects involved – creators, organizers, us-
ers, etc. –, the disciplinary fields covered, the tools, techniques and
methods used, the motivations and aims expressed, the time and place of
implementation or development).

As far as compiling the abstract is concerned, it is sufficient here to draw
attention to the fact that evaluations valid for documentation in general be-
come even more valid within the specific context of the International Bib-
liography's subject matter. This is true mainly because of the incidence of
certain factors, such as the time at the documentalist's disposal for analysis
and his competence in the fields where, each time, he is called upon to act.
In fact, it is clear that these elements become more important in a context,
such as that of legal informatics and computer law, which is strongly
characterized by the constant and rapid increase in information, as well as
by its essentially interdisciplinary nature.

34. For an example of a lexicographical analysis in legal informatics, see C. Ciampi, Note sul
tessico dell'informatica, cit.
35. In the BID data base, in fact, the key TAK (Title, Abstract, Keywords) operates not only
in the section of the descriptors, but also within the title and the abstract.
36. There is a great deal of literature on the features and functions of the abstract; see,
among others, C. I. Bernier, Abstract and Abstracting, in «Encyclopedia of Library and In-
formation Science», Vol. 1, p. 16-38; H. Borok, S. Chatman, Criteria for Acceptable
Abstracts: A Survey of Abstractors Instructions, in «American Documentation», 1963, April,
p. 149-160. For a comparison with criteria formulated for compiling an abstract in legal
documents, see I. D'Elia Ciampi, B. Inghirami Jannucci, M. Ragona (eds.), Norme per la
compilazione del modulo, Florence, Istituto per la documentazione giuridica of the CNR, 1979;
S. Stoppoloni, P. Mercatali, M. Romagnoli, M. Falorni, Informazione giuridica e
4.4. Data Classification and Indexing

With regard to the systematic organization of the discipline and the lexical standardization of data, reference is made to what has already been explained and to specific articles on the matter. As far as data classification and indexing (which may even be considered phases or elements of the analysis) are concerned, only some general comments will be made here.

First of all, it is important to note that the decision to place both a systematic index (Bibliography) and an index of keywords (Keyword Index) together in the International Bibliography corresponds to the conviction (by now widespread among experts in bibliography and librarianship) that it is essential for the two tools to complete and integrate each other.

In fact, the former index organizes the bibliographical material under the headings of the Classification Table, worked out to meet the need for a systematical model which is both permitted and required by the present state of research. Therefore, it offers the reader a general theoretical framework for the data, giving, in a certain way, an overall vision of the contents of each issue and of prevailing trends in the specialized literature. In this respect the classification given can only be seen as provisional, as it requires constant updating because of continuous scientific evolution and of the new reordering undergone by the discipline. On the contrary, consultation of this type of index proves useful only when the user is interested in general (or, at least, not too specific) topics, or when he wants, after carrying out his research using the Keyword Index, to complete it by analyzing the literature under the broader headings where his particular topic is placed. However, the special classification table was built on the Universal Decimal Classification (UDC) model and therefore allows the objective of

37. See § I, 1, for comments on the problem of organizing systematically legal informatics and computer law; the Introduction by C. Ciampi, E. Famel E. and G. Trivisonno to THES/BID: A Computer-based Thesaurus of Terminology in Computers and the Law, cit., for the connection between the specific bibliographical work carried out by the authors and the need for standardizing the lexicon used in the disciplines documented.
38. It may be useful, in this regard, to reexamine the premises of the debate going on for some time in a related field – librarianship – in which the supporters of systematic catalogues conflicted with the supporters of subject catalogues. By analogy, these catalogues can be compared respectively to the systematic index and the keyword index. On the history of the debate cited see, in particular, C. Revelli, Il catalogo per soggetti, Rome, Bizzarri, 1970, p. 54-63.
39. It is well-known that the UDC is a scheme designed to classify all knowledge and, thanks to its characteristic modular extensibility, can be applied both to publications which collect information (books, miscellaneous works, periodicals, etc.) and to reference works referring to them (annuals, catalogues, indices, etc.). Diffused throughout the world by the International Federation of Documentation (IFD) in Brussels, it is utilized for cataloguing by subject, for classifying and for ordering index cards and volumes in libraries and documentation centres. It is also being applied, with increasing frequency, to periodicals for classifying articles and reviews and in bibliographies for the ordering of data. On this topic see E. Famel E., Classificazione eperimento dei dati bibliografici nel «Bollettino», cit., p. xxviii-xxx, and, for comparing the Schema di classificazione used in the «Bollettino» with the Classification Table used more recently in the Bibliography, infra, § 3, p. 200 ff. As already mentioned in note 6, the Classification Table used at present for the International Bibliography is published in «Informatica e diritto», VIII (1982), 1, p. 385-394.
the research to be shifted only vertically, going from the general to the particular (up to the fourth level of specification) and vice versa. The Keyword Index, in contrast with the systematic Bibliography, provides the alphabetic list of the descriptors used by the documentalist in analyzing the source material and connects each descriptor with the titles of the bibliographical units for which those descriptors seemed most appropriate. Therefore, information about similar matters are spread throughout the alphabetic system. Direct consultation of this index implies that the user can identify each time not only the specific matter of interest to him, but also its major aspects by relating to the descriptors which it seems reasonable to believe the documentalist has chosen to represent them. Information retrieval occurs here through further approximations, based on a general knowledge of the specialized language of legal informatics and above all of the terminology contained in the Thesaurus. 40. Only the correct additional use of the Thesaurus permits all possible logical and systematic connections to be made both vertically (from the broader to the narrower term and vice versa) and horizontally (among terms which express similar or related concepts). But, since all headings used in the Classification Table have been included in THES/BID among conceptually structured descriptors, the possibility of a completely articulated search (as described above) is extended to the consultation of the systematic index also. Therefore, through the Thesaurus, both classification and indexing maintain the different functional connotations characterizing and distinguishing them with regard to the needs and methodologies of information retrieval (respectively: general information retrieval only vertically extensible by classification; specific information retrieval neither vertically nor horizontally extensible by indexing), but, at the same time, they lose those limits which are inherent to them.

After these synthetic remarks on the relationship between the two techniques and the particular solution adopted in the International Bibliography, some problems relating to the general interpretation of the headings of the Classification Table and the criteria followed by BID’s documentalists in classifying and indexing the source material selected for publication will now be discussed.

As regards the former, a detailed examination of the interpretation of individual headings will be postponed for a future analysis; it will be noted here that only the first five classes of the Classification Table used to systematically organize data in the International Bibliography deal directly with theoretical (class 0.) and practical aspects (classes 1. and 2.) of legal informatics, as well as legal (class 3.), sociological, political, educational and

40. The characteristics of the various lists of THES/BID and the procedure for consulting it are described in the Introduction, cit., p. vii-xiii, and now also in C. Ciampi, E. Famelì, S. Ricci, G. Trivisonno, THES/BID: un thesaurus di descrittori per l'informatica giuridica e il diritto dell'informatica, cit.
economical problems connected with the introduction of informatics into the various fields of human activity (class 4.). The notion of informatics implicitly referred to is that based on a rational processing of information, carried out mainly by computers and in which numerous techniques and disciplines converge and are functional. Instead, classes 5., 6. and 7. identify matters not included in the main nucleus of the International Bibliography, but which, at present, represent, for other reasons, a necessary addition to it. Generally speaking, the above-mentioned groups of classes can be considered as meeting the documentation needs of two different types of users or of two distinct phases in the approach to legal informatics and computer law. In fact, classes 0. to 4. furnish a theoretical apparatus and a particular analysis of applications and problems in areas which have already become part of these disciplines, whereas classes 5. to 7. are limited to indicating border areas or to identifying advances and conquests achieved in sciences connected or related to legal informatics but reasonably extensible to it.

Finally, the subclass 0.4. and class 8. have a distinctive connotation with regard to all the other classes, because they label types of documents (reference works) and not their content.

In order to carry out a search within the systematic Bibliography, the user wishing to consult this index directly must, first of all, ascertain whether he has placed the topic of interest to him exactly within the proper general class, keeping in mind that specific headings of a lower level have to be read and interpreted in a systematic way, that is to say by making reference to the hierarchically superior headings under which they are classified. Reference to this interpretation criterion explains the recurrence in the Classification Table of headings which are the same from a literal point of view, but which represent different concepts on the basis of these different hierarchic relations. Contrarily, the general rule requiring the single headings of the Classification Table to be interpreted in a systematic way implies that, sometimes, headings which are different from a literal point of view define similar concepts.

41. For this definition see the comments made in § I, 1. and the citations quoted in the notes.
42. For example: Legal information retrieval systems are considered from a general theoretical aspect under heading 0.2.2. and from a practical aspect connected with judicial administration under heading 1.2.3.; Linguistics is viewed in its relation to legal informatics under heading 0.3.5. and as a field of application for computer technology under heading 5.1.3.; the subject of transport and traffic regulation is considered as a sector of the economic activities of the State under I.3.1.6. and as a sphere of technological innovation under 5.1.6.
43. Hence, while numerous applications of computers are explicitly indicated by the expression «computer in...» or the like, reference to applications under some headings can only be found by going back up to a superior level in the Classification Table (these cases could be indicated as «elliptical headings»); see, for example, headings 1.1.5. and 1.3.1.1., 2., 3., 4.
Regarding, in particular, the criteria followed for data classification by the International Bibliography’s documentalists, it is sufficient here to mention only the most important. First of all, attention is directed towards the specificity of the user groups to which the Bibliography is addressed. This implies that when giving the classification code, although the evaluation of the document must not be «twisted», the documentalist must simultaneously take into account the aspects of interest to the law which the document contains.

Documents selected for the International Bibliography deal mainly with both specific theoretical and applicative matters. Therefore, in organizing the documents systematically attention must be paid not only to identify the subject matter exactly, but, above all, to proportion, as far as possible, the hierarchic level of the code to the level of the analysis carried out. Moreover, in order to keep the printed Bibliography within acceptable limits, only one classification code is given to each bibliographical unit; therefore, various solutions have been worked out to cover the variety of possible cases of documents dealing with more than one topic at the same time. Should all these topics have the same weight and importance, it seems better to use the more general code covering them all together. Preference, instead, is given to the heading which is as near as possible to the main theme and the prevailing approach when various topics are dealt with from one particular point of view, or when a dominant thesis is put forward, or when one of the topics can be identified as that of major importance. Different problems occur when the document deals with a specific topic to which no suitable heading of the Classification Table corresponds as far as that concept and its hierarchic level are concerned. In this case the residual heading «Others» under the relevant general heading is used. Finally, bibliographical units of a general or introductory character are classified with the code «General» of the relevant class 44.

With regard to the considerable number of documents relating to an applicative field, it is important to draw attention not only to the fact that the documentalist always tries to stress the relationship with the law (through the abstract, the descriptors and the classification code), but also to the different aspects (and therefore to the different systematical connections) which implementations assume according to whether they are carried out in the private or public sector 45.

In order to conclude these brief remarks on the criteria for classifying the bibliographical material on computers and law, it is pointed out that only

44. Headings 0. and 3., for which there is no «General» heading on the second level, are exceptions to this rule.
45. Consider, for example, the different emphasis which may be given to legal information systems created by professionals in the private sector in order to satisfy, above all, organizational requirements and the need for efficiency in comparison with large data bases managed by public bodies in the administrative field (codes 2.1.1. and 1.2.3.).
classes 0.4. and 8. have a double reference: one is substantial and refers to the topic dealt with in the bibliographical unit under consideration and the other is formal and refers to the typology of the document, which is specified, in these cases, because of its particular importance.  

The indexing of BID’s material is the object of autonomous analysis where both the aspect of lexical standardization and the conceptual organization of descriptors are discussed. Here, it is important to keep in mind only some of the general principles followed by the documentalists not only in harmonizing data, but also in providing users with not only concise, but also highly informative and easily retrievable bibliographical analysis. The first requisite is of the same importance for both the printed version of BID (necessity of keeping the number of pages and of the issues within acceptable limits) and for the on-line database (quickness in querying the data base, reduction of noise during the answer, practicality in printing of requested data, etc.). The second requisite expresses clearly the quality of the bibliographical analysis carried out on the individually selected documentary units and is the result of a co-ordination of the information included mainly in the title and in the abstract, as well as in the descriptors. In this respect, the indexing is a fundamental moment in the analysis and implies delicate although not unconditionally discretionary choices in integration. Finally, the third requisite has different aspects (and therefore imposes different solutions and leads to different results), depending on the channel used for dissemination (the printed publication or the on-line data base).

Concrete rules for functional and co-ordinated indexing may be drawn from the comments made above, concerning the characteristics which documentary analysis should have in general, and in the evaluation of influences deriving from the combined use of traditional and automated means for data dissemination.

Most of these rules tend to limit the choice of descriptors (because of the need for conciseness). Therefore, apart from the compulsory use of words included in the Thesaurus, a maximum number of descriptors was decided upon. The length of the analyzed document is to be taken into account within this maximum number. Secondly, once the most specific descriptor relating to the topic discussed is identified, the document should not, in addition, be indexed with more general terms, belonging to the same conceptual hierarchic structure. And, furthermore, when the suitable descriptor for defining a complex fact or concept exists in the Thesaurus, only this

46. A code in 0.4. is used for consultation and reference works in legal informatics in its narrow sense, while the codes in class 8. are used for documents with the same typological form, but relating to general informatics.
48. Eight is the maximum number of descriptors which may be used in indexing.
descriptor is to be used and not two or more other keywords which, put together, would represent it 49.

Finally, some other criteria depend directly on the informative level of the documentary analysis and therefore tend to recuperate, through the descriptors, data or information not found elsewhere. This is the case for those descriptors which (aimed at making documents retrievable in the printed Bibliography) point out the secondary or functional aspects of the contents of a bibliographical unit whose classification code expresses only the most important argument. The same is valid for the details referring to the document’s typology, when they are considered important over and above the generic indication given by the letter of the identification code. But, beside the data expressed in the codes, descriptors may also integrate the information contained in the title and in the abstract, identifying the public body or the organization promoting a theoretical research project or carrying out a concrete experiment, providing more detailed geographical locations, giving the exact name of systems or instruments used or even stressing similar themes or logically related matters 50.

4.5. Data Processing, Reproduction and Printing

The International Bibliography contains three different lists: the index of keywords (Keyword Index), the systematic and analytic bibliography (Bibliography) and the index of authors (Author Index).

The first index is a KWOC index in which the descriptors (keywords or phrases) are printed as headings on the left-hand side of the page, above the titles of the documentary units to which they refer. Titles are given in full in their original language (followed by their English translation in the case of titles in other languages), alphabetically ordered under each descriptor and completed with their relevant alphanumeric code (including, apart from the classification code, the progressive number and also the letter identifying the document’s type). Consultation of this index, which is useful for those users who have already identified the topics of interest to them, must be integrated with the analysis of the conceptual structure described in THES/BID for each descriptor. By using the alphanumeric reference code the user can easily move from the Keyword Index back to the systematic Bibliography, where a complete description and analysis are provided for each documentary unit according to the above-mentioned criteria.

49. Hence, a document on automation in the Public Administration is indexed with one descriptor («Automation in the Public Administration») and not with the two separate keywords («Automation» and «Public Administration»).

50. Real synonyms are not permitted in indexing, but descriptors which are quasi-synonyms or have a general association with those representative of the main content of the document may be added.
and rules. According to the systematic organization of the material all relevant bibliographical information is listed in a progressive numerical order under each heading of the different hierarchical levels of the Classification Table; it allows for a different type of approach suitable for satisfying wider but not detailed search needs, which are complementary to the simple identification of data regarding the specific topic being searched.

Finally, the third index contains the alphabetic list of the authors of the documents. The titles of the respective works are given in full, under each name, followed here too, if needed, by the English translation. When an author has written more than one book or paper, the titles are alphabetically ordered according to the first letters of the title, while reference to the complete bibliographical information is, as always, given by the alphanumeric code recorded on the right hand side of the page, on the last line of each title.

Consultation of the Author Index allows the user not only to have more complete details about a document when only its author is known, but also to be informed about all the works written by that particular author.

In order to allow the computer to organize the data in these lists, suitable initial preparation, as well complex data processing are necessary. This data processing obviously differs according to the result desired. Thus, as far as the systematic Bibliography is concerned, the aid of the computer is limited to the organization of documentary units according to the Classification Table (on the basis of the code given and, within it, on the basis of the alphabetical and numerical succession, respectively, of the identification letters for the type of document and of the numbers used to label it). Instead, the role of the computer becomes vital for the other lists, because they may be considered as being directly extracted from the contents of the main list. Besides, the data processing carried out for the various parts of the International Bibliography, which is aimed at achieving a publication complete with all the graphic and editorial requisites for its simple consultation, has been linked to electronic phototypesetting techniques.

Considering the various phases in this procedure, it should be noted that they are all based on the constant collaboration and exchange of ideas between the International Bibliography's editors, data processing technicians and experts in electronic publishing. For example, the work on the form prepared for data acquisition, carried out by various experts, permitted the introduction of special identification codes which are important both for the processing of the single lists included in the International Bibliography and for the phototypesetting of the text with the types, the spacing and all the required printing modalities in general. In the same way, the solution was adopted, during the phase of data registration, of including typefaces acting as codes, suitable for indicating to the computer (according to the symbol used or to its position) all the graphic peculiarities desired in the final version of the text (differences in the size and in the series of
typefaces, distinction between capital and small letters, indication of accents and special graphic symbols, various graphic orders).

At this point text control is carried out. This phase is divided in two different stages: the checking of the graphic presentation (pagination, margining, division of the parts making up a page, etc.) and the checking of the correctness of data by comparing the text with the original. For the former, the necessary corrections are carried out within the phototypesetting system and are, in practice, new programming instructions, operating each time with regard to the margining, pagination, etc. Checks of the latter kind relating to the right transcription of data are a task of the editor-publishers of the International Bibliography and are carried out on the printout, which is now easier to read, because of the introduction of small letters, accents and numerous special graphic symbols. Corrections made to the printout are then transferred to the data stored in the computer, while a special control program ensures their introduction in the right position, reducing to a minimum the burden of further checking. The programs for text management and processing can be divided into two groups according to whether they carry out operating functions or whether they aim directly at the realization of the Bibliography as a published work, having the specific organization and presentation of data described above. Programs for the control, correction and printing of the data base belong to the first group, whereas programs for ordering and extracting the lists belong to the second group. In particular, with regard to organization, the sequences taken into consideration are both the numerical (classification codes, progressive numbers of the documents) and alphabetical (first letter of the descriptors, of the authors' surnames, of the titles, abbreviations in relation to the typology of the documents), while the extraction of the lists requires a link-up to the titles to be grouped together in order to put them in the desired position. Finally, the phototypesetting, which precedes the final printing, is completely automated. In fact, the phototypesetter which performs all the necessary operations for obtaining the text in its final graphic form is «driven» by a specially programmed computer able to give all the necessary instructions. The functions performed by the general programs used for the phototypesetting of the International Bibliography are numerous and important. These functions are concerned with not only the automated margining and pagination, but also the progressive numbering of pages, the defining and the placing of the running and fixed titles and the automated insertion of the rules. 51. The use of such highly sophisticated techniques results in the

51. For a more analytical description of the various steps in the electronic processing and automated phototypesetting of texts, see A. GALLO, Esperienze di gestione con calcolatore e fotocomposizioni bibliografiche, Turin, ILTE, s.d., 12 p.; specific reference to the evolution of the computers and systems employed in phototypesetting at ILTE (which is responsible for the processing and phototypesetting of the International Bibliography published by the Istituto per la documentazione giuridica) can be found in R. MAZZONI, Alla ILTE si fotocompone COSY, in «Data Report», 12 (1982), 1, p. 31-33.
obtaining of high graphic quality as well as a remarkable saving of time in
the printing operations. In fact, once data is reproduced on photosensitive
film, the publisher has only to photograph the final text.

5. Data Dissemination and Retrieval: The BID Data Base

Automatic data processing procedures lead to many problems of the re-
lationship between traditional methods of information dissemination, based
exclusively on paper documents, and new technologies, fundamentally con-
ected with the use of computers and therefore with the creation of mod-
ern information systems. From this point of view, the use of the most re-
cent techniques offers wide possibilities for influencing the cost/
benefit relationship positively. However, as the problems and the objective
difficulties which some categories of users face (above all in some geog-
ographic areas) in consulting information systems cannot be neglected, it is
necessary to consider the possibility of using the traditional channels for
information dissemination which print offers. At present, the wisest choice
seems to be in aiming at not losing any of the advantages offered by both
these two techniques.

5.1. Prospects in the European On-line Information Network

The International Bibliography on Computers and Law, although created as
a printed publication, can also be consulted on-line, on the basis of the ag-
reement signed in 1976 between the Istituto per la documentazione
giuridica on the one hand and the Electronic Documentation Centre of the
Italian Corte di Cassazione and the Automatic Documentation Centre of
the Italian Chamber of Deputies on the other hand. Lower courts, courts of
appeal and numerous public bodies are linked to the system of the Corte di
Cassazione. Moreover, a regulation has recently been passed allowing even
private citizens, on the payment of a yearly subscription, to consult the data
base. Instead, numerous local administrations are connected to the system
of the Chamber of Deputies.

The choice made in this sense by the editors of the International Bibliog-
raphy is in accordance with the trend to use more and more extensively
advanced technologies for the dissemination of documentary data. In fact,
access to on-line information is immediate and permits an actual dialogue
between user and system through terminals directly linked to a computer or
rather to those telecommunication networks which are becoming increas-
ingly specialized and complex, at both a national and international level.

52. Information dissemination on these networks is made possible by the organizations which
acquire the data on punched cards from the producers and then see to the storage, processing
and inquiry, building up in this way the appropriate system for on-line retrieval. These ser-
ices, defined as «host computers», represent, along with user terminals, the basic elements of
Information, once it has been organized in machine readable form, is managed in a completely automated manner to the great advantage of the user, who is then able to interact with the computer.

The general issue of access to electronic data banks lies outside the topic of this paper. However, because of the great practical importance and the large number of problems connected with the so-called information market, it must be stressed here that a real risk of monopoly exists. Thus, there is urgent necessity for enlarging the number of national and international bodies able to produce information and to intervene so that information dissemination networks are organized efficiently, in order to guarantee the widest possible access for users. An adequate exchange among different cultures can, in fact, only occur in this way, with a view to ever-increasing international collaboration and integration 53. It should be noted that the American presence in the field of on-line data bases has, without doubt, represented an inevitable point of reference for activities of this kind within European countries and in particular in Italy. The risk has, furthermore, become more and more apparent that overseas data bases, which are easily accessible and widely consulted in Europe also, will end up by indirectly influencing its culture so much that they will compromise its particular characteristics 54. The European Economic Community project DIANE/ Euronet fits into this prospect and, in the same way, the European network at present being studied meets the need for Europe to gain its own particular image within the on-line information market 55.

5.2. Data Base Management and Updating

Data analysed for the International Bibliography on Computers and Law is regularly entered into an electronic data base called BID, an acronym for the words making up the Bibliography’s Italian title. At present, this data base contains more than 10,000 documents, with an annual average increase of 2,500 bibliographical units.

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55. For details on the development predicted for the DIANE/Euronet network, see the Proceedings of the DIANE/Euronet Conference, cit.
Twice yearly, the Istituto per la documentazione giuridica provides the Electronic Documentation Centre of the Corte di Cassazione and the Automated Documentation Centre of the Chamber of Deputies with a copy of the magnetic tape containing the data already published in the printed bibliography. However, the material which periodically increases the data base is not completely homogeneous because of the modifications which, little by little, have been introduced over the last few years, both in relation to data classification and indexing and to its description and presentation. The editors of BID were, therefore, presented with two possibilities for working on the data base, that is of either preparing the current updating on the basis of the new innovations (without any revising of the material already recorded) or of harmonizing the entire data base working on all the stored material, in order to give the data base a uniform aspect.

Intervention of the former kind would have given rise to the necessity of making all those instruments (keyword index, classification tables and so on), which had been used for the preparation of the recorded bibliographical material in the past, available on-line. Otherwise, most of the data base would have in fact remained practically inaccessible. In the latter hypothesis, however, document retrieval would have been easier, but, on the other hand, a great deal of work on the harmonization of the whole documentary base would have been necessary.

In spite of the considerable work load, this latter alternative was chosen. Thus, at present, the data base is undergoing an in-depth revision of all recorded documentary material, using the most recent Classification Table, the new criteria for data description, keyword selection and normalization by applying the special Thesaurus. At the same time, the input of material contained in the first issues of the Bollettino bibliografico d'informatica generale e applicata al diritto is progressing. This data is carefully selected and completed before being stored.

Moreover, work on the documents contained in the data base is carried out taking into account the need for making the greatest effort to maintain their historical character. For this reason, it was considered right to differentiate, even if only slightly, between the selection criteria used for the recovery of older material and those followed for current updating, so that the development occurring, over a period at time, in the definition of the boundaries of the discipline and therefore in the corresponding research in this field could be taken into account. This choice leads to the result that, while in the data base there is still much information among the data taken from the early bibliographical issues (published since 1972) relating to information and documentation science in general, then gradually an increasing specificity in topics more strictly relevant to legal informatics and computer law is to be found.
5.3. Data Indexing, Research and Retrieval

It is well-known that information may be stored using different indexing systems. In fact, the possibilities are: indexing by artificial language (based on keyword used to identify the document content and furnished during the preparatory phase of input) and indexing by natural language (called full text indexing, in which every word contained in the text plays the role of an independent access key). However, each system has some disadvantages and, in order to remedy these, intermediate systems, using mixed languages, have been formulated 56.

In the BID data base documents have been stored by using a mixed language indexing technique permitting retrieval by using both the natural language of the abstract and the artificial language of the descriptors assigned to the single bibliographical units.

Data is managed with the automated storage and retrieval systems FIND 1 and FIND 2 in the network linked to the Electronic Centre of the Corte di Cassazione 57 and with the STAIRS/AQUARIUS system in that of the Chamber of Deputies 58.

The FIND system provides seven retrieval channels for BID: 1) the TD (Type of Document) channel, which selects documents on the basis of their type, identified with the letters B (Books and Booklets), M (Miscellaneous works), P (Periodicals) and G (Grey literature); 2) the CD (Decimal Classification) channel, which has a standard made up of numbers with a maximum of six figures corresponding to the headings of the Classification Table, allowing documents to be retrieved by their classification code; 3) the AUT channel, which permits a search based on the indication of the author’s or editor’s name and surname; 4) the TAK (Title, Abstract, Keywords) channel which operates within the data contained in the original title, its English translation, the abstract and the keywords; 5) the IBT channel, which identifies the requested documents by its bibliographical and publication details (for books and booklets: publisher, place of publication, year of publication, series and so on; for miscellaneous works: editor, title of miscellaneous work, publisher, place of publication, year of publication and so on; for individual articles in journals: journal title, volume, issue, year of publication, page numbers, etc.; for grey literature, all


58. See the Note sull’uso dello STAIRS, published by the Automated Documentation Centre of the Italian Chamber of Deputies, Rome, 1979.
available information that may be of help in identifying the document; 6) finally, the NP channel, which permits a search on the basis of the progressive number of bibliographical units.

The channels described are of type 1 or type 2. If the channel is of type 1, the computer selects all documents having an alphanumeric character string identical to the word or to the series of figures given by the user as a search key (channels relating to the type of document and its progressive number belong to type 1). For channels of type 2, instead, the computer selects both documents having, as a search key, a character string identical to the word or to the series of figures given by the user and documents having longer search keys, provided that the first part corresponds exactly. Retrieval channels of type 2 (CD, AUT, TAK, IBT) permit the implicit masking of data and therefore word searching through roots.

Apart from those described above, other channels are planned and, although not yet activated, they will be able to identify documents through the code of their source language (CL), the Documentation Centre (CT) or the year of publication (AN). Proper reference tables will also be prepared along with the list of source materials scanned and of abbreviations for the titles of the journals.

5.4. Data Output

In the BID data base both the complete printout of the requested documents (with the order PRINT), and the printout of partial sections may be obtained by indicating the symbol, using the assigned codes (11: abbreviation for the Istituto per la documentazione giuridica and progressive number of the document; 1A: author or editor; 1T: title and similar information; 1B: bibliographical and printing details; 1C: decimal classification).

The following information for each document is supplied on terminals linked to the network of the Corte di Cassazione:

1 abbreviation of the Istituto per la documentazione giuridica of the CNR which provides the Corte di Cassazione with the documents for the data base in question;
2 progressive number of the document;
3 author’s or editor’s name and surname;
4 title in the original language followed by its English translation;
5 code of the Documentation Centre which has produced the document and the bibliographical references;
6 classification code given to the document;
7 abstract (in English) and indication of the original language;
8 keywords used to identify the contents of the document completing the information given in the abstract.
Here is an example of a document in the form in which it is presented to users of the Italgiure System.

Research on the terminals linked to the Automatic Documentation Centre of the Italian Chamber of Deputies requires the use of the STAIRS/AQUARIUS System. The document in this system is organized in several information units, or «paragraphs», including one or more words in one or more «fixed fields» (formatted), which are in a preset position in the record and are of a fixed length. Each «paragraph» is made up of «sentences» (corresponding to speech periods in natural language).

Documents are selected from the BID data base by using the search function, whereas printout is obtained with the command browse. The document structure may be displayed by using the explain of the browse function and includes eight «paragraphs», each of them identified by its own code, as the example on page 232 shows.

In DOC there are details relating to the issue of the International Bibliography in which the document was published, to the progressive number of the document and to the Istituto per la documentazione giuridica of the CNR as data supplier; AUT contains the author's or editor's name; TIT, the document title in the original language, followed by its English translation; RIF, the number of the Documentation Centre and bibliographical and typographical references; RIA, the abstract of the article and the indication of its original language; CLA, the number of the classification code;
A new database called THES/BID, related directly to the BID database, will soon be organized. It may be consulted during a search for information in BID, without interrupting the search itself. THES/BID will contain the entire thesaurus of keywords permitted for document indexing. The retrieval channels provided for it derive directly from the structuralization in lists of the printed work, with some rearrangements, due to the peculiarities of on-line retrieval. Besides the Classification Table, the following lists will be stored: the KWOC Index, the Structured Alphabetic List, the Hierarchy List with the relative Index to the Hierarchy, the Geographic List and the two Acronym Lists.

Some examples of consultation of the BID database are given in the following pages. In the ItaliGiure System of the Corte di Cassazione the questions asked by the user are distinguished from the answers given by the computer by the dollar sign ($), while in the STAIRS/AQUARIUS System of the Chamber of Deputies both the questions and answers are printed in small letters in contrast to the system notices which are in capitals.
Searches carried out with FIND 1 of Italgiure System.

**Question 1**

A. Select documents classified with code 3.8.3. (*data security measures*)
B. which were published in 1977 and
C. have English as their original language.
D. Print the documents.

<table>
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<tr>
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<td>✦ TAK. SOFTWARE*PROTECTION; MK = X R 1</td>
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<td>B</td>
<td>✦ IBT. 1978, MK = X R 2</td>
<td>8 DOCUMENTI</td>
</tr>
<tr>
<td>C</td>
<td>✦ TAK. ITALIAN, MK = X R 3</td>
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FALCETTI CARLO

*LA PROTEZIONE GIURIDICA DEL SOFTWARE (SOFTWARE LEGAL PROTECTION),
CLASS. DEC. 3521

THE AUTHOR TACKLES THE ISSUE OF SOFTWARE LEGAL PROTECTION WITH A VAST ANALYSIS OF LEGAL IMPLICATIONS, NATIONAL AND INTERNATIONAL LAWS ON THE MATTER, POSSIBILITY OF ENFORCING SOFTWARE PROTECTION AND COMPARISON WITH OTHER TYPES OF INTELLECTUAL PROPERTY. HIS CONCLUSIONS ARE THAT SOFTWARE OWNERSHIP CAN BE PROTECTED UNDER A NUMBER OF PROVISIONS, PATENTS, LAW COPYRIGHT LAW, AND FAIR COMPETITION REGULATIONS. HE ANALYZES ARGUMENTS TO THE CONTRARY AND COMPARES ITALIAN LEGISLATION WITH OTHER NATIONAL AND INTERNATIONAL LEGISLATION. THOUGH NOT ALL OF THEM AGREE, HE CONCLUDES THAT GENERALLY—SPEAKING SOFTWARE IS CONSIDERED AS A PRODUCT OF HUMAN INTELLIGENT AND AS SUCH IT MUST BE PROTECTED. SOURCE LANGUAGE ITALIAN.

SOFTWARE LEGAL PROTECTION COPYRIGHT PROTECTION PATENT PROTECTION
FINE DELLA STAMPA DEI DOCUMENTI.
Question 2

A Select documents on legal protection of software
B which were published in 1978 and
C have Italian as their original language.
D Print the document.

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<td>13 DOCUMENTI</td>
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<td>C</td>
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<td>3 DOCUMENTI</td>
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<td>D</td>
<td>📐 PRINT, IST. DOC. GIUR / CNR − FIRENZE</td>
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MEREDITH GUY,
ICI CASE HIGHLIGHTS A SECURITY DILEMMA.
CLASS. DEC. 383
A DISCUSSION ON SECURITY ARRANGEMENTS AND PRECAUTIONS,
AFTER A SIMPLE THEFT OF COMPUTER TAPES AND DISKS. SOURCE
LANGUAGE: ENGLISH.
DATA PROTECTION

CHOULES ROGER,
COMPANIES MUST NOW LEARN FROM ICI'S EXPERIENCE
CLASS. DEC. 383
AFTER SUCH A GLAMOROUS THEFT OF ICI'S COMPUTER TAPES, THE
AUTHOR GIVES TO OTHER COMPANIES SOME USEFUL GUIDELINES ON
THE COMPUTER SECURITY. SOURCE LANGUAGE: ENGLISH.
SECURITY OF INFORMATION COMPUTER SECURITY.

PRITCHARD JOHN,
NETWORKS. A GUIDE TO THE RISKS AND HOW TO BEAT THEM.
CLASS. DEC. 383
THE AUTHOR DISCUSSES NETWORK SECURITY PROBLEMS, INCLUD-
ing SYSTEM AVAILABILITY, INTEGRITY AND CONFIDENTIALITY,
STAND-BY AND RECOVERY PLANS, REGULAR MONITORING (SECURITY
AUDITING). SOURCE LANGUAGE. ENGLISH.
TELECOMMUNICATION SECURITY MEASURE SECURITY AUDITING
FINE DELLA STAMPA DEI DOCUMENTI.
Searches carried out with STAIRS/AQUARIUS of the Chamber of Deputies.

**Question 1**

A Select documents on economic, politic and legal aspects of informatics
B which were published in 1978, with English as their original language and
C which relate to the USA.
D Print the documents.

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<td><strong>LIVELLO</strong></td>
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BID0000000336 DOCUMENT = 1 OF 1 PAGE = 1 OF 1
DOC | 78 4 0109 1 — ist. doc. giur. / cnr — firenze.
AUT | tapper colin.
TIT | computer law.
RIF | 60 london, longman, 1978, 190 p.
RIA | the book deals with several areas of law as they relate to computer technology, including intellectual property, contract, tort, crime, evidence and privacy. the book compares different common law approaches to all of these problems, but most particularly the law of england and of the united states. source language: english.
CLA | 3.
ESP | legal issues of informatics (edp law and information law).
PK | intellectual property, tort. contract. crime. evidence. privacy. united kingdom. usa.
R0601 = ULTIMA UNITÀ DOCUMENTO, BATTERE INVIO O UN ALTRO COMANDO
** RICERCA ** INIZIARE A BATTERE LA DOMANDA DOPO IL NUMERO DI LIVELLO 00001 office adj automation and Italy

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<td>the olivetti is developing distributed informatics for the office automation by the production of easier languages, cheap magnetic medium, modular architecture system. source language: Italian.</td>
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FINE DELL'UNITÀ DOCUMENTO

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<td>RIF</td>
<td>10 informatica 70, 1979, January/February, no. 64, p. 39-41.</td>
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<tr>
<td>RIA</td>
<td>automation of the office is a field still almost unexplored by manufacturers of electronic equipment for processing information. the a. systematically analyses the problems of office automation and describes a computer called ulisse 7601. this was designed and developed in Italy (pisa) as a first attempt of organic design of a system oriented in this direction. source language: Italian.</td>
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<td>CLA</td>
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<td>ESP</td>
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R0601 * ULTIMA UNITÀ DOCUMENTO. BATTERE INVIO O UN ALTRO COMANDO

236
CONCLUSION

To conclude this analysis – in an articulate but, in many respects, certainly not exhaustive fashion – it is opportune to outline some general problems which have still to be investigated.

In the first place, legal informatics documentation, even though it is instrumental to and dependent on the discipline constituting its object, must acquire the status and therefore receive the attention required for its real advancement. The importance of documentation, in general, is by now too well known and widely recognized to need discussing here. This is even more evident when dealing with a recently established discipline 59. Therefore, it seems opportune to emphasize how essential it is, especially during this phase, that the documentalist has qualifications not superficially related to the discipline with which he is concerned eventually becoming both a scholar and an expert 60. In any case, there must be strict collaboration between documentalists and researchers so that the determining and orderly advancement required by the legal world may follow, avoiding employing efforts in the wrong direction and exploiting to the full the new potential offered by science and technology.

The panorama presented by the literature on legal informatics is extremely varied and heterogeneous, but – as is the rule for any new science – the proliferation of contributions on the subject does not correspond so much to the wealth of ideas and initiatives as to the desire to explore new territory whose limits are still not clearly perceived. The contrast, at least in appearance exasperating, between two cultures in many respects in antithesis must be added to the many difficulties encountered along the way. The need for stability and certainty in the law conflicts with the frenetic and relentless course of technological conquest. At the same moment in which the legal operator’s understanding finally reaches the point where he can perceive the new dimensions of the reality surrounding him, this changes once again, raising problems which immediately prove traditional conceptual structures inadequate.

Naturally, attention was first drawn to the concrete aspects of possible applications. For this reason, the substantial conditioning of earlier legal informatics publications by technicians and the fact that legal operators began reacting too late to this hyperspecialized, overwhelming technical world must be acknowledged. The detailed and enthusiastic descriptions of early applications – which were then rapidly multiplying in often disordered and chaotic ways – are still today the most significant and obvious expression of


60. On the importance of the documentalist’s role see M. PIANTONI, Il documentalista, in «Data Manager», 6 (1982), 15.
a phase in the research, when the abundance of projects was matched only by the uncertainty of their aims. The scientific thinking beginning to appear in the best literature, while still watchful and alert to the continuing parallel advances in available technology and instrumentation, does not seem, however, even yet to be engaged in finding general organic premises or comprehensive and systematic theories. The need to keep up to date with the evolution of informatics has probably forced the interruption of this necessary phase of critical reappraisal or, at least, has retarded it. This is also due to new methodological problems emerging in the sphere of traditional legal procedures.

The introduction of legal informatics into the teaching programmes of law faculties in Italian Universities, as has taken place over the years in various other countries (not only in America, but in England, France, Germany and Sweden), would certainly contribute to stimulating more profound studies and more solid, interdisciplinary research, enabling young lawyers to acquire a timely understanding of the fundamental role of informatics in various aspects of their daily work. Instead, at the present time, informatics only forms part of the curriculum in some technical faculties (Engineering and Information Science), while in the humanistic faculties only a few seminars are provided (in Milan, Florence and Rome).

As far as the International Bibliography on Computers and Law is concerned, some further developments and improvements, important for both its future and its contents, should be mentioned here. Firstly, the growth in specialized literature would involve a more precise and restricted identification of sources relevant to legal informatics and computer law. This may be brought about by collaborating with an increasing number of distinguished scholars and by a «weighted» statistical analysis (if necessary, carried out with the aid of the computer) of the documents produced by specialized journals in a predetermined period of time. The documentation on publications of countries not yet technologically advanced but now beginning to utilize informatics must not, however, be overlooked, while adequate channels for documentation retrieval must be found for those countries which, although highly advanced, are not yet taken into consideration (Japan, Australia, etc.). The pursual of these kinds of objectives must, however, be measured against the requirement of a very wide organizational structure modelled along managerial lines.

Finally, inserting the International Bibliography in international on-line networks would encourage a direct relationship with experts and would permit the more rapid and precise updating of information. On this basis a

wider range of users would be identified, for whom up-to-date bibliographies on specific issues could, on request, be produced.

In this way the International Bibliography is destined to become a powerful and versatile scientific instrument of interest not only to research institutes but also to documentation centres, university faculties and to both public and private organizations.