IPERINFLEX: A Hypertext for Legislative Drafting
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1. HYPERTEXTS AND LEGISLATIVE DRAFTING

Difficulties in consulting and understanding legislative texts are the major concerns of an extensive literature dealing with accurate analyses and widely rooted commonplaces. Highly qualified research has indicate that there are four main problems experienced with legislation resulting from statutes lacking simplicity and clarity¹.

- **Language.** The language of statutes is obscure and complex, its meaning elusive and its effect uncertain.
- **Over-elaboration.** Statutes are often over-elaborated in their quest for certainty in the expression of the legislative intention.
- **Structure.** The internal structure and sequencing of clauses within statutes is poorly arranged and often illogical.
- **Arrangement and Amendment.** Statutes are enacted and amended in a form that makes it frequently impossible to ascertain the current state of the law with respect to a given subject².

² By many authors this aspect is considered the most serious obstacle for law understanding and application. Gian Gualberto Archi writes: "A second series of useful remarks, in my opinion, is what I would call the myth of clarity and brevity. This myth can be qualified as the expression of a way to see law problems in a vulgar way, giving the adjective 'vulgar' the leaning which is today applied by part of law historians (and I am one of these ones), that is the fall in style of the juridical reflexion. In fact, the idea of simplifying the law by the clarity and the brevity of statutes is juridically poor: every case in point has its own aspects that are almost always unrepeatable. The statue is an abstract rule. What law laymen very often call obscurity and prolixities, reveal themselves in the very moment the concrete gets in contact with the abstract. And this is inevitable. It is not a case that the most refined collaborators of Justinian did not so much dwell upon weaving eulogy of the brevity and clarity of the statute itself, as a panacea for all evils. On the contrary, they were against the confused result of the historical development which, being as such – and their
This article concerns the description of IPERINFLEX, a computer-based tool aimed at reducing reading difficulties deriving from the bad structure of the text and especially from the complex integration amongst legislative texts. Paper (namely printed paper) is the most used support for divulging and consulting statutes. The paper support in an easy and user-friendly way for reading a text in a continuous and sequential form. If the law, also in consideration of how it is divulged, has assumed the form of a continuous and sequential text, the same cannot be always stated for its contents. The norm is a whole changes, integrations and interpretations intercross and where, normally (that being a rule with many exceptions), a new utterance does not replace (or does not completely replace) the previous, one but is added, integrating or modifying it.

So far computer-aided systems have reproduced and maintained the sequential structure of the paper support but unfortunately, have broken continuity. In fact displaying a spread sheet document on a computer screen implies a fragmentary consulting mode. Normally, in the case of an act, the screen shows only one article thus hindering both the comprehensive view and the possibility of moving from on point of the article to another like in a book.

Moreover, the printing quality of documents in computer files is poorer than in printed texts. Very often, only capital letters are utilized, the use of heavy and italic type is very uncommon, special printing signs are not available, text indenting is not accurate, etc. These deficiencies may be considered as nonessential aspects but our belief is that, due to this organizational and display approach of the computer-based document preference is still given to printed documents. Nobody would be particularly excited about reading a novel on a computer screen!

Informatics has now found two solutions for these reading and consulting drawbacks.

a. Improvement in input tools and word processing systems is positively affecting the print quality of stored documents. Thanks to text recognition programs, it is possible for a text to be quickly stored with all its printing features. Word processing and desk top publishing programs can manipulate the text structure by improving its formal quality and adjusting it to computer editing.

remark is sharp – produces ‘ignorantia legum’. A part judges, being practically impossible to know all the legislation in certain circumstances, they limit themselves to discuss law on those few texts available. The base conception of Justinian and his collaborators is that a legislative work has to bring order inside rules, always having a look both at the past (history) and at the present" [Archi 1987].
b. Hypertext-oriented systems allow links and navigation amongst the pieces of one document or different documents. Hypertext is a tool — or a whole of computer-based tools — that can interlink two or more texts according to a semantic network-like structure matching the human brain. Links can be activated by anchoring them to any data (a word, a sign, an image, an expression...) and this tool, starting from that datum, allows other information or documents to be retrieved. Therefore, this makes it possible to draft a virtual text based on a set of information linked together on a conceptual basis in an easy way.

This system makes consulting a non sequential legal text easier in that it is formed by subsequent clusters, linked by conceptual of formal recalls. We want to underline that the difficulty due to the sequential structure for both traditional computer-based and paper supports is overcome; the lack of physical continuity for the computerized text is overwhelmed by providing a conceptual continuity; the limited possibility of moving from one point to the other of a document is increased; the difficulty of moving inside a document and among documents (also difficult for paper) is easily ensured by browsing and navigating activities.

2. Legislative Drafting

Legislative drafting or legistik is a special legal discipline for drafting legislative texts and making them clearer and more easily applicable, thus overcoming the reading and understanding obstacles mentioned above.

In Italy, origins of the technique, or better, of the “modern” science of legislation, date back to the studies conducted by illuministic jurists, such as Muratori [Muratori 1780] and Filangieri [Filangieri 1742]. In the last century and the beginning of this century, under the influence of Empirism of the British School, “the ideale of a legislation science as it was conceived by Filangieri and supported by the other illuministic thinkers, was gradually replaced, in the contemporary legal culture, by a model of «legislative drafting», intended as an operational method for drafting and communicating “the legal message” [Frosini 1988].

In recent years, the work carried out by the Barettoni Committee [Barettoni, 1983] has given impulse to legislative drafting techniques. This layed the basis both for providing a series of rules for national and local

3 The term ‘legistik’ came from German language. For a definition and short outline of the legistik or legislative drafting see [Rescigno 1992].
law makers and for drawing deeper attention to legal authority through studies and seminars, university courses and specialized schools. In 1986 a Ministerial circular was issued that gathered and extended the suggestions indicated by the Barettoni Committee. This circular elaborated by the draftsmen of the Chamber of Deputies and, at the same time, issued by the Prime Minister and by the Speakers of the Chamber of Deputies and the Senate, thus becoming an integrated part of the internal regulations of the Chambers [Fusaro 1986].

Afterwards, the structure of Parliament and Government, entrusted with the activity of legislative drafting, was better defined and strengthened. A proper drafting office was set up at the Senate, while the Chamber of Deputies was assigned with new tasks and tools for assisting Parliament Commissions in drafting legislative texts [Manzella 1991]. The statute no. 400 of 1988 established that a central office for coordinating Government legislative activities and initiatives should be set up at the Premier’s Office. This statute requires to indicate any normative incongruities and antinomies in the annual reports to be presented to the Prime Minister and to the relevant Ministers and to be transmitted to the Speakers of the two Chambers.

This activity led about ten Regional Councils to adopt some rules and suggestions related to legislative drafting techniques and to enact regulations, circulars, recommendations.

Thanks to these instructions, the *Handbook of Rules and Suggestions for Drafting Legislation* was issued. In 1989, in Palermo, a work team promoted by the ‘Osservatorio Legislativo Interregionale’ under the direction of Prof. G.U. Rescigno, presented this new *Handbook*. Afterwards, it was reviewed by a proper Committee formed by Regional, Parliament and Government draftsmen and by experts in legislative techniques and in legal informatics. The *Handbook* is currently used by Regional legal drafters as an official and homogeneous Manual and is a reference point for Parliament and Government which should finally adopt it.

Thanks to these numerous initiatives affecting various fields of appli-

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4 For a survey of rules and indications concerning legal drafting techniques made by Italian and European law bodies see: [Pagano 1988]. For a wide bibliography on legal drafting techniques, refer to: [Pegoraro 1988] and [Ainis 1990].

5 Statute 400/1988, article 23, section 3.

6 The paper ‘Regole e suggerimenti per la redazione dei testi normativi’ is available at the ‘Osservatorio legislativo interregionale’ at the Consiglio Regionale della Toscana.

7 Four Regions (Valle d’Aosta, Liguria, Toscana, Trento) have officially adopted the Handbook while many other actually follow it.
cation, over a ten years' period, a series of normative, technical and cultural tools have been issued to offer a helpful support to the legislator\(^8\).

3. **Automated Legislative Drafting (Legimatics)**\(^9\)

Over the past years, legislative drafting has gained strength after being outshone by the supremacy of the interpretation theory.

Informatics provides legislative drafting with new algorithms, new tools and legislative drafting is discovering informatics as a suitable tool to manage the models it has produced. All the more so because, if these models are computer-compatible, they prove being technically valid; it can also be stated that the more these models are valid, the more they are computer-compatible. However, it is not advisable to rely on informatics for creating the models and structures of the legislative text or, better, for delegating the solutions connected with all the problems of vagueness uncertainty and non-coordination of norms. It is the 'legislative engineer' who has to face these tasks with legal, linguistic, logical and political expertise. Informatics will allow most users – even if they lack this knowledge compared with the expert in legislative drafting – to apply and manage adequate solutions in a more sure, quick, updated and homogeneous way.

Rescigno indicates the nature of the relationship between informatics and legislative drafting\(^10\): "from now on, those who discuss topics related to legislative drafting techniques should constantly be in contact with those who can provide computer-aided tools. This does not mean that we must

\(^8\) For an exhaustive and updated outline of these studies and initiatives in the legal domain within legislative bodies of Public Administration, of Universities and, in general, in the research and teaching field, see: [Rescigno 1995].

\(^9\) The word *legimatics* (mot-valise from *legislazione e informatica*) indicates the studies and activities that deal with designing and applying supporting computer-based tools and methods not only to legal drafting techniques, but also to the other legislative techniques, such as feasibility analysis, procedure analysis, application checking or management control [Biagioli Mercatali Sartor 1993].

\(^10\) Pioneers of legal informatics have realized that informatics is powerful tool for legislative production [Simitis S. 1977] and [Losano M.G. 1984]. The present evolution in informatics has opened possibilities of intervention unknown to the first research and application of legislative informatics that had only arrived at creating automatic documentation tools, even if other possibilities of interventions had been envisaged. Today tools have been designed and implemented to intervene in the law making phase from decision making to legal drafting and feasibility analysis; a new and wide research and application field has opened which has been called "Legimatics".
all become experts in legal knowledge based systems; it means that the law expert collaborates with the expert in legal knowledge based systems and vice versa...” [Rescigno 1990].

Over the past years, this resulted in a cooperation that has never stopped. From one side, lawyers with computer knowledge have helped issuing rules for drafting legislation which were contained in the final drawing of the Handbook. It has not been an easy task to conciliate computer needs with the draftsman and legislator demands. Obviously, where conciliation was not possible, the latter have prevailed. The right method is that of not imposing computer-aided schemes, but making the models processed by the jurist computer-compatible. Conversely, ‘legislative engineers’ have indicated their needs to computer experts. Since the very beginning of the meeting held by the Istituto per la Documentazione Giuridica (IDG) in 1989, it was clearly pointed out that drafting cannot be isolated and dealt with by informatics without taking all the other features of law making into consideration.

As a consequence of these remarks, made both by jurists and computer experts, cooperation activities have been set up that, based on these indications, have led to the first implementations. Initially all systems have concentrated on a text drafting aid base, yet improved by documentation, information and simulation functions.

Between 1989 and 1992, the first computer-based systems were designed for drafting legislative texts and the works were presented at a meeting held in Bologna [Biagioli Mercatali Sartor 1993] which put an end to the pioneer phase and started the implementation phase.

Today, legislative draftsmen are examining the possibility of implementing computer-aided tools for drafting statutes and administrative deeds as well as integrating them with information retrieval and office automation tools already in use. Noteworthy is the activity of the group “DRAFTING e analisi di fattibilità delle leggi”, carried out by the “Coordinamento permanente dei sistemi informativi statali e regionali”, which is designing a computer base drafting support model [Gioria 1994]. It should be underlined that the Valle d’Aosta Region is preparing an “Electronic Desk” for its draftsmen [Poletti 1995]. In Holland, the Ministry of Justice, has already been equipped with an Advisory System for its legislative draftsmen [Voermans, 1995].

4. Early Automated Legislative Drafting Systems

Lexedit, Lexeditor, Iri-AI and Leda can be considered as the first experimental semi-intelligent legislative drafting support systems especially designed to aid law making.
4.1. Lexedit

Lexedit, a prototype designed by the IDG and implemented with the cooperation of CSI Piemonte, represents the first tool aimed at helping legislative drafting. This project has introduced the idea of a special word processing program for legislative texts as well as of a law making environment, intended as workstation for the drafter. This system provides a linguistic aid and check, and legal technical functions, supporting functions for the generation of statutes, structuring and organizational functions for text drawing and simulation functions for the normative impact. Lexedit is aiming at:

a) providing various computerized functions to cover a wider range of drafters’ needs.

b) applying various techniques expressly processed by artificial intelligence and computational linguistics.

c) assembling tools with different purposes, going towards an increasing merge of computerized techniques, as it is worldwide [Biagioli Mercatali 1993].

4.2. Landexitor

The “Laboratorio Progetti Speciali” of the INSIEL, in Gorizia has designed Landexitor for the Friuli Venezia Giulia Region. Landexitor is a program which, in addition to the functions designed for Lexedit (which draws inspiration from), manages, simultaneously, both the modifying and modified text. Other complementary procedures (yet autonomous) are associated both for easy and effective access to data bank and evaluation of the impact of new statute over the area to be regulated [Marzano 1991].

4.3. IRI-AL

At the CIRFID (Centro Interdipartimentale di Ricerca in Informatica, Filosofia e Diritto) in Bologna, initiatives for automating legislation have been developed with particular attention to a system aiding legislative drafting (IRI-AL), with the cooperation of the Emilia Romagna Region experts. This system allows statutes to be drafted through a specialized word processing program, enabling to apply the instructions indicated in the Handbook of Regole e suggerimenti per la redazione dei testi normativi [Baldini, Capelli Sartor Tura 1995].
4.4. LEDA

Leda is a prototype Legislative Design and Advisory system developed by the University of Tilburg and experimented by the Dutch Ministry of Justice. It is designed to give access to the recommendations in a methodical way, and through this, offer knowledge-based support for the drafting activities of the legislator regulated in the Recommendations. Leda has four major functions, namely:

a. methodological support;
b. document drafting and assembly support;
c. knowledge-based information retrieval;
d. legislative advice.

These four systems have originated from the computer-aided law making environment” [Biagioli 1988]. Each of them proposes original solutions and investigates different features. Lexeditor has particularly developed the relationship between the law making environment and documentation systems, while IRI-AL has mainly given interesting answers to assist drafting (or “generation”) for particular statements of statutes. Lexedit has introduced the idea of a legislative drafting support system and represents a starting point towards the proposal of a «Law-making Environment» as a support for the whole legislative process.

This new field of legal informatics has not yet been fully brought to the attention of the international research community. Besides the LEDA system, only few other projects and systems have been designed. An example is the legislative drafting support system called Justus [Wilson 1989], designed in Great Britain, where other initiatives are being developed. In the Unites States, in addition to the well known works carried out by Allen [Allen, 1982] and Sprowl [Sprowl, 1989], only partially pertaining to automated legislative drafting, many systems aimed at helping legal drafting have been implemented[1].

5. Structure and Function of an Automated Legislative Drafting Tool

Since 1981 the Handbook of Regole e suggerimenti per la redazione dei testi normativi represents a useful reference point both for legal drafting

[1] On the use of software for document management and dealing with texts in American legal offices, see for example [Marks 1993].
techniques and automated legislative drafting ("Legimatics") [Biagioli et al. 1993].

The Handbook instructions can be read not only as statutes addressed to draftsmen, but also as "specifications" that define functions and objectives of tools aiding legislative drafting. Those who develop legislative drafting software should carefully consider these instructions as well as the practical, needs and organizational structure of legislative bodies.

The use of computer-based systems designed on the Handbook instructions can help in the complying with the instructions themselves. To this end, the legal drafter does not need to be imprisoned in a rigid computerized environment. On the contrary, the forms indicated by the Handbook should be transferred into computer-aided tools (schemes, models and formulas; files and databases; functions for processing and checking texts, etc.) so as to exercise a "promotional" function, and not a preventive or a repressive one. These tools should carry the Handbook instructions into effect (and, more in general, provide clearness, rigour, uniformity of legislative language) and, at the same time, make the drafter's work easier.

Some of the applications highlighted above require a well developed computer system where the legislative drafting software is linked with documentation systems. However, the availability of advanced tools for automated legislative documentation does not represent a necessary conditions for using informatics in legislative activities. Many computerized functions for assisting legislative drafting, especially drafting functions strictly pertaining the text 'packaging', can be developed even with an elementary computer-aided support (an isolated personal computer).

The strict compliance with the Handbook instructions increases the possibility of applying informatics in legal documentation and in law applications; however, this does not mean that the target of legislative drafting is that of laying out the conditions for computerization. Clearness, rigour and uniformity needs (based on the value the certainty of the law) must represent the main purposes of the draftsman. The more these purposes are pursued, the more informatics will be successfully extended in the legal domain.

The Handbook computerizing project contains five areas as follows:

1. Word Processing
   - Processing, standard and legal spelling checking;
   - Lexical, syntactical, and stylistic checking;
2. Drafting Library
   - Linguistic and legal supports;

3. Documentation
   - Telematic network;
   - Data bank and information systems;

4. Structure
   - Formal;
   - Hierarchical;
   - Functional;

5. Generation
   - Text assembling (first level);
   - Text construction (second level).

**Fig. 1. Framework of a Legimatics Tool**
Fig. 1 shows the framework of a tool where already existing software and software on progress can be inserted [Mercatali 1995]. This project is the result of the work carried out by the group “Drafting e analisi di fattibilità delle leggi” developed by the Coordinamento permanente dei sistemi informativi e di legislazione statale e regionale. Members of this group are local legislative executives and computer experts of Regions and Parliament, researchers of the Istituto per la documentazione giuridica and computer systems experts of the Public Administration. The group provides the “Conferenza dei Presidenti dell’Assemblea dei Consigli Regionali e delle Province autonome” with a complete law making environment project which will be a homogeneous tool for developing their own legislative drafting supporting programs. The group will also provide an outline of all the systems that can be used.

Hypertext is seen as a propaedeutical step towards the development of these tools for legal draftsmen with the aim of:

- gathering and linking drafting rules,
- helping avoiding repetition of reading and understanding obstacles in these “meta-rules”.

6. IPERINFLEX DESCRIPTION

Iperinflex is a hypertextual version of the Handbook of Regole e suggerimenti per la redazione dei testi normativi (Fig. 2).

Besides the Handbook text and its attachments, Iperinflex includes some more pages, connected with single articles or groups of articles with notes, examples and other information in addition to notes and examples already included in the official text. The user can add other examples of right sentences (and even wrong ones), recurring expressions, sections, articles. He can load useful information to be retrieved during drafting and can also link other texts of rules and indications useful to legislative drafting.

Iperinflex’s main feature is to provide the user with a well defined, homogeneous, easily comprehensible base structure that allows the construction and the extention of documentation in a hypertextual way. We can

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12 Iperinflex works in a MS Windows 3.1 graphic ambit. The hypertextual engine is designed on Asymetrix Toolbook 3.0. It was been developed by the Istituto per la documentazione giuridica with the cooperation of the Centro Toscano Informatica of Florence and Stefania Bellavia for data-input. For an experimental use, it can be requested to: P. Mercatali, Istituto per la documentazione giuridica, Via Panciatichi 56/16, Firenze.
say that Iperinflex is organized on “pages”, (‘page’ is not the proper word as it is taken from a paper book; it would be better to say ‘documentary unit’). Every documentary unit can contain texts, tables, graphics, images, photographs, etc. The program also allows jumping among documents and linking different pages, by simply pressing down the mouse button.

Some of the functions available are illustrated below.

**Indexing.** The main index is composed of the table of contents of the Handbook items (Fig. 3). By clicking on this table, the corresponding item is displayed. Starting from the table of contents or from any other document, Iperinflex can be browsed in a sequential way, as in traditional books, by pressing the right arrow button of the menu command.

**Text Searching.** One or more documents can be searched through any textual word, single or linked to others, by using the boolean operators (and or). The searching function is supported by a reference list of keywords that is a sort of analytical indexing\(^1\). It can also be used as a thesaurus by loading links of iponymyons, ipernoyms and synonyms, offering the user

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\(^1\) Reference has been made to Indice Analitici del Manuale, by Emilia Bini for the legislative service of the Consiglio Regionale della Puglia.
the terms useful for retrieving the most important rules, definitions; concepts and suggestions included int he Handbook. The keywords have been extracted exclusively from the Handbook text so as to form an essential lexicon of legislative drafting. This lexicon also allows the retrieval of the other documents contained in the hypertext, such as notes, examples, attachments, other rule texts.

Hotwords. Pages can contain hotwords. Hotwords are words or expressions which, during the hypertext projecting phase, have been associated to one or more documents. They are displayed on the screen with a different color and, by clicking the mouse button, they allow jumping to another page or opening a window with another document (article, example, attachment, etc.) (Fig. 4). The new document can contain another hotword for another link and so on.

Once the link chain is formed among pages thanks to hotwords and to other retrieval commands, backtracking is possible by using the proper command.

Linking Possibilities with other Programs. Iperinflex can be consulted while drafting a text by means of a word processing program in a Windows environment through a single command. Copying and pasting operations have been made easier "to import" text portions from Iperinflex to Word
Fig. 4. Opening a Window by Pushing the Hotword ‘Numero 30’

1. Per i numeri che servono a citare partizioni di atti normativi contrassegnati da cifre (articoli, commi numerati, numeri interni ai commi) si rinvia al numero 30 e relativi.

2. Per le citazioni di testi normativi italiani, comunitari, internazionali, attenersi formule ed ai criteri contenuti nell’allegato B1.

3. Per le citazioni di partizioni interne agli atti normativi attenersi alle formule e ai criteri contenuti nell’allegato B2.

Fig. 5. Iperinflex Text Export Tool
processing (Fig. 5). Iperinflex can also be linked to other types of programs i.e. a data base.

**Linking Possibilities with other Handbook.** Iperinflex allows constructing new hypertexts to manage other groups of rules for drafting purposes (i.e. those in force in foreign legislative bodies)\(^\text{14}\) and link them to the Handbook, through the mechanisms described above.

**Iperinflex Updating.** Iperinflex has two main menus (Fig. 6 and 7). The first menu is used in the consulting phase, the second one can be accessed for changing and updating the hypertext. In fact, the user can add other pages or other data to existing ones. From a computer standpoint, storing and linking new information is not difficult and even the unskilled user is able to carry out these operations after some hours training (by reading the on-line Handbook or attending a short training course).

Updating a normative text may raise some difficulties in organizing the document and cause some problems from the documentation standpoint which will be examined later on.

Just to give some examples, it is possible to:

- create a list of foreign words with legislative definitions of rules in force (i.e. purchases of "futures", "call and put options", "swaps"\(^\text{15}\)) to be linkes to article 17 of the Handbook, through a hotword (i.e. the expression "foreign term");
- create one or more pages with examples of compulsory or illustrative, cumulative or alternative numberings (right or wrong ones) and associate them to article 10 of the Handbook.
- create various documents linkes to one another, as a footnote to article 75, such as the article 15 of preliminary rules of the Italian Civil Code.

In short, Iperinflex, like other hypertexts, offers two main advantages for drafting and consulting normative texts:

\(a\) it provides textual linking among different information, according to logical-systematic, linguistic and other criteria the user may choose.

\(b\) allows the text to be continuously updated with subsequent and separate clusters without modifying its original structure.

\(^{14}\) Dutch rules for legislative drafting have been included in a hypertext and can be accessed through the LEDA system [Voermans 1995].

\(^{15}\) See article 37 of the Regolamento 2 Luglio 1991 of the Banca d'Italia on exchange risks.
Fig. 6. Iperinflex Consulting Menu

Fig. 7. Iperinflex Changing and Updating Menu
On the other hand, these are peculiar features of a non sequential text which is a suitable channel for legal information. The gloss, a textual form widely used by Roman and Middle Age jurists, conforms to these two features and has been congenial to legal communication for a long time. The same statement can be made for hypertexts today.

A brief outline of the genesis, structure and use, of glosses with particular reference to those belonging to the ‘bolognese school’ will follow. It may help focus on the similarities between the gloss-like system and hypertextual tools when dealing with a text, with the hope that it can also be helpful to solve some difficulties that may arise in the use of this new computer-based documentary support.

6. Glosses

Gloss comes from the Greek γλῶσσα used by the ancients with the meaning of a note – interlinear or marginal note – which was written on a manuscript as a comment to its content.

The word gloss, equivalent to the Italian chiosa, already appears in Aristotle (Rhet., III, 3, 2) and represents a form of teaching or study, dating back to remote antiquity.

One of the usual forms of Roman jurisprudence consisted in making comments on the works of former jurists, so that it is possible for us to separate what is the commented text from what is the comment upon the text.

In particular, juridical works seemed to need clarifications, observations, additions to make their use in schools and forums easier. The collections of ‘iura’ and ‘leges’, known under name of ‘Fragmenta Vaticana’ and belonging to this period, contains various glosses.

The teaching of Roman law in the universities underwent an evolution: a succession of “schools” appeared, each having its own emphasis and methods of commenting upon and explaining the Roman law texts. A first school, that of the glossators, endeavoured to fix the original meaning of the Roman laws.

From the fourth to the eighth century glossators flourished and ancient glossaries were used. Very famous is the ‘liber glossarum’ of Isidoro and well known were bilingual glossaries. Barbaric laws as well as the Rotari edict and the salic law included glosses in the Germanic dialects to explain

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16 For the use of hypertexts in the legal field, see: [Di Giorgi Nannucci 1994].
expressions and concepts to judges. However glosses themselves became obscure and incompreensible to those who did not know German, in other words, to most people.

A great law school was established at Bologna as the center of new learning, and interpretations and commentaries upon the precious Justinian text began to be written.

The most famous gloss is that of the Bolognese school. Tradition dates the beginning of the Bolognese school back to Pepo (end of the eleventh beginning of the twelfth century). The most famous names in this period were Irnerio, Bulgaro, Martino Gosia, Jacopo, Ugo di Porta Ravennate.

The bolognese gloss has gradually moved from a simple and brief to a longer and complicated form.

Like the oldest ones, the bolognese glosses were very varied. They went from the simple grammatical or lexical illustration of the meaning of a word or the diction of a text to the critical explanation of a law (followed by a collection of variants), from the indication of parallel meanings to the resolution of antinomies with other laws, to the exemplification of practical cases.

The school of the glossators reached its height in the middle of the thirteenth century with the work of Accursius (1182-1263).

The margins of the manuscripts of the various ‘Corpus Juris’ were soon filled with so many glosses that a work of reordering and drafting was needed. Accursius, in his Great Gloss, recast the efforts of this predecessors into a treatise comprising approximately 96,000 explanatory glosses.

Although the Accursius gloss had marked the work of the predecessors with symbols, it is difficult to identify and individualize them due to the doubtful interpretation of these symbols17.

In the course of ages the extensive use of the gloss technique has made it possible to update and complete juridical texts; by allowing linking and contemporary representation of the various elements the document is organized with. We can state that today hypertexts offers such an interpolation mechanism to make both connection and consulting of legislative texts easier.

However, as with the gloss-like system, two problems arise that will,
with all probability, resurface is using hypertext as a tool for legislative documents.

1. A technique that allows text linking and clustering may make it hard to reconstruct the original document or may disperse or pollute its meaning.

2. The possibility of comparing and inserting documents coming from different authors may make it difficult to go back to the production source of the document.

Paolo Mari, a scholar of the gloss technique, writes: «it is certain that as to the Longobard edict, the circulation and the reproduction of normative texts were regulated and pre-determined, being the conformity of the copy to the original document granted by penal sanctions too. Almost the same thing occurred for the Justinian works; in fact, if the scribe has used abbreviations, he would have been prosecuted for forgery and would been kept responsible “in duplum” towards the consignor. It is certain “a fortiori” that a similar, or ever more serious, responsibility would be ascribed in the case the legal text – to be brought up for trial – would be found different from the copy lodged at the law court, whose conformity to the original document was certified...”. On the other hand, neither authors nor the community consider the gloss as a final deed; therefore, in this respect its circulation is very similar to the one of the normative text, at least before universities define and regulate, through the “stationarii”, the principle of conformity of copies to original documents, even in the case of exegetical deeds.

Before the bolognese exegesis takes on a canonical and unchangeable feature, which is an attribute given to the Accursius gloss, the gloss circulates as a deed which, despite having an intrinsic and informal authority, can also be influenced by external elements, such as the teacher’s form, precedent and customary readings. In addition the fact of not considering the gloss a final deed, makes it likely for accidental events to affect its circulation so as to make the transmission rule quite open.

From the table of the transmission rule (Fig. 8), it can be noted that the existing gloss, owing to circulation, may remain as it is or may come in touch with a new data (B); the result of this improper contaminatio may be: the indistinct conversion of the two data, their distinction or the disappearance of one of the two data. In the end, the result may form a final moment of the transmission with the consequent conclusion of the rule or may be assumed as data (A) with the repetition of the process described [Mari 1982].

It is clear that modern legislative systems use highly tested mechanisms,
Fig. 8. Flowchart of Gloss Rule Transmission

I = rule start; F = rule stop; A = data; B = other data; C = circulation; R = outcome; R(A + B) = separate maintenance of both data; R(A.B) = mixed maintenance of both data; R(A)/R(B) = one data maintenance only.

formalized into meta-rules, to avoid contaminations of the glosses and the texts they glossed.

We do not intend to analyze or criticize the formal techniques of linking and validating the rules within a legislative system. We only want to provide some indications as to the correct use of the hypertextual documentary technique in the legislative field in an attempt to ensure compliance with
these mechanisms. It will probably be necessary to probe more closely into these indications. It might be useful to have the scholars of the gloss systems and the legal informatics experts debate these questions to define better both the organization and the features of hypertextual tools in helping legislative communication.

Generally speaking, we can state that the hypertext makes it possible to link the text and the gloss; it also allows underlining, classifying and excluding this combination, thus giving back, when needed, the integrity of the original text. This is already an aspect which may overcome the problem of contamination which brought about prohibitions and penalties for glossators. This is probably why glosses disappeared when they started being considered a dangerous tool for text manipulation.

To avoid confusion among subsequent clusters of information in preparing and updating the hypertext, two techniques can be applied: versioning and authoring.

**Versioning.** This system will never delete any text, not even when new versions are added. This permanent record of all versions makes it possible for other documents to link either with the current version of a document or with a specific version. Some systems also allow to display the versions of the text to be changed or the ones which have been added afterwards. Iperinf1ex will follow this criteria. The make reading easier, thanks to the versioning technique, it is possible to insert the new document on top of the old one by displaying the new versions and going back to read the two documents separately. This avoid the confusing of the original text with the new version.

**Authoring.** The hypertext system may keep the identity of the authors as attributes of nodes and links and use that information to determine authorizations to change or delete the information. It can also be possible for the user to ask the system to filter the hypertext with respect to the author IDs to see only nodes and links added by particular categories of users. In some cases the users can be divided into two or more categories with different access privileges. A typical example is the use for teaching where the professor would be authorizes to add or change the “canonic” hypertext structure whereas the students would be authorized only to add links and annotations18.

Iperinf1ex structure allows updating of more authors. If this technique is used, authoring will allow regulating access and changing “powers” for

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18 On the use of the authoring technique in hypertexts see for example: [Nielsen 1990] and [Maioli 1993].
the various users with the possibility of always going back to the production source of each document.

7. Iperinflex Prospects

Iperinflex has been designed as a tool for consulting the rules of legislative drafting but may be extendend to other applications in the field of law making.

a. Legislative Glossary. Hypertexts can contain expressions and formulas frequently used in legislative texts. For example, it will be possible to link the *Handbook* article dealing with abrogations with a series of documents having abrogative formulas. In this way, the draftsman will easily find the correct expression to be used for abrogating a rule. Then, by means of a copy/paste system (already available in Iperinflex), he will be able to import the formula into the text and include it into the article.

b. Educational Applications. There have been many hypertext systems produced specifically for educational use. As a matter of fact, many applications have an educational slant. Some hypertext enthusiasts claim that hypertext is the most natural way to organize human ideas. Hypertext is well suited for open learning applications where the student is allowed freedom of action and encouraged to take the initiative. In fact, hypertext allows the student to browse through a large set of information and see those parts that interest the student or make sense in the context of a current assignment 19.

Iperinflex will be a useful educational support in the courses of legislative drafting which are becoming more and more numerous in Italy.

Iperinflex proposes to organize a normative text (which can be defined as an anomalous text) which is composed of a system of expansive rules, yet actually almost complete.

It the use of hypertexts for legislative applications spreads, particular care to text restructuring will be needed to overcome the phenomena of contamination and confusion amongst the different clusters of the law underlined above. On the other hand, if what has been briefly stated above is properly applied, this tool will help:

- not to consider clustering and intercrossing as obscure elements of the legal text to offer the reader the possibility of recomposing the text according to its own needs;
- to make the legislative system clearer, allowing citizens to enter the society government apparatus whose rules are often uncertain, contradictory and entangled.
REFERENCES


Pietro Mercatali / IPERINFLEX: A Hypertext for Legislative Drafting