Computer-assisted legislative drafting in the Netherlands: the LEDA-system

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1. DRAFTING ASSISTANCE AND COMPUTERS: LEGIMATICS

Using informatics to further the drafting of legislation, i.e. the field of legimatics, is a discipline which - though very young - already can claim a modest tradition. In legimatics basically two approaches towards the development of legal IT systems currently exist: the information-oriented approach and the Artificial Intelligence (AI) approach. In the information-oriented approach, legal and legislative problem solving processes are considered to be information problems. IT systems built according to the information-oriented approach assist system-users by processing and providing accurate information to solve the information problems which arise in solving a certain problem. Information-oriented IT systems supply the information need. For the development of IT systems like these, an accurate insight into the information needs of a problem-solving process is needed. In the AI-based approach, legal and legislative problem-solving are considered to be reasoning processes which require knowledge. In systems built according to the AI-oriented approach, attempts are made to represent the knowledge needed to solve a certain legal or legislative problem and model it in a way which allows a computer system to 'reason' with it. Legal AI systems therefore can (partly) solve legal problems by 'machine processed' legal reasoning. Building AI-based systems requires accurate insight into how specific legal problems are solved and what kinds of specific knowledge are used during the problem solving. In the recent past some authors like myself have argued that, given the characteristics and open ended nature of a lot of legal problem solving processes, like the legislative process or the policy processes leading to decision in public administration, the AI-based approach is as of yet not productive for the building of automated IT drafting system assisting legislators for the duration of their decision processes. Legislative drafting involves far too much different and too complex sorts of reasoning and knowledge to be representable for a computer system. This does however not mean that the AI-based approach cannot be productive to build IT tools for specific parts of legislative drafting or decision support systems for the application of legislation.

In this contribution I will discuss the development, motivation and functionalities of one drafting-support information system in particular: the so-called LEDA-system. This system was built to support Dutch legislative draftsmen during the drafting process. LEDA is a Legislative Design and Advisory System designed to offer easy access to the Dutch Directives for Regulations (Aanwijzingen voor de regelgeving). It guides users through an interactive drafting checklist and

it checks legislative drafts to see wether or not important drafting requirements are met.[1] The LEDA-system is currently being used within Dutch ministerial departments. The Belgian federal government is considering a similar system to support legislative drafting, called Solon[2]

2. LEGISLATIVE DRAFTING AND LEGAL PROBLEM SOLVING

The Dutch LEDA- project started out with a theoretical survey of the legislative process in the Netherlands. In order to be able to assess the possibilities of computer supported legislative drafting an in-depth insight in the nature of legislative processes is fundamental. Considered closely legislative drafting appears as a complex and open-ended decision process which differs quite substantially from a lot of strictly 'legal' decision processes. Legislative drafting for instance involves far more sorts of knowledge than mere legal knowledge. Furthermore legislative processes and legislative problem solving are only partly determined by legal rules.

If we examine the legislative decision making process more closely, we see for instance that legislative draftsmen do not merely use legislative methods and legal rules to tackle legislative problems. During this process they constantly make all kinds of legislative decisions. These decisions can never claim to be perfect, of legally valid decisions. Legislative decisions or solutions can only claim to be 'relatively appropriate' solutions[3] in view of all the (factual, societal, political, legal, and socio-economical) circumstances involved. Legislative decision making is therefore not a process of application of fixed legal standards, but an open process in which a legislative draftsman weighs different possible solutions in view of their relative appropriateness). The relatively best solution is the solution which is substantiated with the most convincing arguments. The most convincing arguments will be the arguments which rate very high in the *legislative discourse* in which legislative draftsmen find themselves together with their departmental superiors, politicians, members of parliament, interested parties, lobby groups, etc. Very convincing arguments, or *authoritative arguments*, in this discourse will be the arguments upon which almost everyone agrees. In this sense legal (e.g. constitutional) arguments or generally accepted legislative methods and techniques constitute strong authoritative arguments to back up a solution, while mere personal or political opinions or beliefs have a much lower ranking status. The appropriateness of a draft is largely dependant on the quality and the status of arguments which sustain the solutions held in it. In the legislative decision process legislative draftsmen will always try to find and use the most strong argument possible to substantiate a solution and in choosing between equivalent solutions he or she will choose the solution which is backed up by the most convincing arguments within the legislative discourse. This searching for and weighing of) especially) authoritative arguments is a process which can be conceptualized, modelled and formalized.[4] The LEDA system harbours a modelization of this 'argumentative strategy'.

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1 See W. Voermans, *Sturen in de mist ... maar dan met radar; de mogelijkheden van de toegepaste informatica bij het ontwerpen van regelgeving.* PhD-thesis, Tilburg University (W.E.J. Tjeenk Willink, Zwolle 1995), p. 183 ff.

2 See R. Van Kuyck, S. Debaene en B. Van Buggenhout, B. Solon - A computer aided statutory drafting system for the Flemish government, in *Conference Proceedings of the Fifth International Conference on The Law in the Information Society* (Istituto per la documentazione giuridica del CNR, Florence 1998 CD-Rom).

3 R. Hotz, Strukturierung des Vorverfahrens der Gesetzgebung - Erste Schritte zu einem allfälligen Einsatz von Computern bei der Schweizerischen Gesetzgebung, in Theo Öhlinger (Hrsg.), *Gesetzgebung und Computer*, (München 1984), p. 164 ff.

4 See S. Toulmin, *The Uses of Argument* (Cambridge University Press, Cambridge 1958) and the application of Toulmin's argumentation theory in a general architecture for knowledge-based IT-systems L.J. Matthijssen, *Interfacing between Lawyers and Computers*, PhD-thesis, Tilburg University (Kluwer Law International, The Hague 1999), p. 77 ff.

3. LEGISLATIVE QUALITY STANDARDS AS A MOTIVATION FOR THE DEVELOPMENT OF LEDA

3.1 Legislative quality standards

Legislative drafting is - as I pointed out in the former paragraph - not primarily aimed at achieving legal validity but rather on reaching the highest possible quality standard of legislative decisions. Legislative quality, in its turn, is largely dependant on the span of the considerations underlying the decisions in a bill. But, what do we mean when we want to discuss legislative quality? There is no general definition, but legislative quality will always concern questions related to the way in which legislation meets general accepted legislative quality standards. These standards are not universal. They vary in nature and content according to the legal system they belong to. They may involve constitutional, legal, political, societal and administrative standards, alike. The Dutch Directives for Regulations are an example of a heterogenous collection of legislative quality standards.

During the1980s the Dutch government became increasingly concerned with the quality of legislation due to serious problems regarding the quality and effectiveness of legislation. To improve the overall legislative quality, different policies were pursued and enacted.[5] One of the main results of these governmental efforts and policies was the adoption of a general legislative policy, which consists of a set of measures aimed at the lasting improvement of legislative quality by setting quality criteria. A substantial part of these measures concerns the fundamental drafting stage.

3.2 The Directives for Regulations

In The Netherlands, the increasing complexity of this assignment has resulted in a crisis in the legislative quality of bills in the latter part of the 1980s. As a reaction, legislative quality policies were adopted and laid down in the Directives for Regulations.[6] These Dutch Directives are quite elaborate. They are a comprehensive legislative-technique handbook, but also contain substantial legal and policy-related legislative issues. As a result the Directives are a voluminous set of drafting guidelines, accompanied by a lot of secondary information (examples, explanations, illustrations, model clauses, *etc.*) which are to be observed by all government officials and public servants when drafting bills. Deviation from the Directives is allowed only if application of the Directives would lead to 'unacceptable results' (Directive no. 5). The Directives constitute a voluminous 'Draftsman's handbook' dealing with every important activity within the drafting process. They concern methodological and substantive legislative issues e.g. how to prepare a draft, how to adopt elements of public policy into proposed legislation, how to implement European legislation, what kind of legislative instruments to use, how to delegate legislative powers, how to attribute administrative authority, what kind of quality considerations are to be made, etc., etc. Directive 7 offers a good example of these 'methodological' Directives. It states:

> **Directive 7**
> Before deciding to introduce a regulation, the following steps shall be taken:
> a. knowledge of the relevant facts and circumstances shall be acquired;
> b. the objectives being aimed at shall be defined in the most specific, accurate terms possible;
> c. it shall be investigated whether the objectives selected can be achieved using the capacity for

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5 *Legislation in perspective*; a policy plan for the further development of the general legislative policy, aimed at improving the constitutional and administrative quality of government policy, policy memorandum by the Dutch Ministry of Justice (The Hague 1999).

6 *Aanwijzingen voor de regelgeving* (Directives for regulations), regulations for legislative drafting issued by the prime-minister november 26, 1992, *Stcrt.* 1992, 230

self-regulation in the sector or sectors concerned or whether government intervention is required;
d. if government intervention is necessary, it shall be investigated whether the objectives in view could be achieved by amending or making better use of existing instruments, or, if this proves to be impossible, what other options are available.
e. the various options shall be compared and considered with care.

Other Directives concern the more technical aspects of drafting, like the structural design of a draft (arrangement of the elements in the draft). See for instance Direction 97 which states:

Directive 97
1. If this is important for the accessibility of regulation, this is systematically divided into sections numbered with Arabic numerals.
2. With a division into one level, the sections *"part" or "paragraph"* are stated.
3. With a division into two levels, the sections of the first level *"part"* and the sections of the second level are called "*paragraph*"
4. With a division into more than two levels, the sections are called *"section", "part", "Title", "chapter" and "paragraph"* in order of size in the understanding that in any case the indications *"part"* and *"paragraph*" will be used.

Another group of Directives is even more strictly legislative technique oriented Directives concerning the phrasing and terminology of a draft (including the use of model clauses, model presentation-letters etc.). Directive 133 gives an example:

Directive 133
For the regulation of the Instruction of supervisors the following models are used:
a. Instruction of supervisors by law:
(Indication of civil servants or other individuals) are charged with supervision of compliance with ..... (indication of prescriptions involved).
b. Instruction of supervisors pursuant to the law:
1. (Indication of civil servants or other individuals) are charged with supervision of compliance with (indication of prescriptions involved).
2. A decision as referred to in the first paragraph is published in the Netherlands Government Gazette.

Finally there is a group of Directives that concern all kinds of drafting-related (legislative) procedures. In this section a lot of model letters and style-requirements are incorporated. An example of this last group of Directives is offered by Directive 209.

Directive 209
1. A memorandum prompted by the report to the Lower House and a memorandum of reply and a memorandum prompted by the final report of the Upper House is preferably only signed by the minister with primary responsibility.
2. The co-involvement of one or more other ministers is in this case expressed in the memorandum.

3.3 Handling the Directives

The Dutch Directives are voluminous. There are 391 Directives, but their total number has increased due to different amendments that have taken the form of sublettered 'a-z' Directives. The total number of the Directives exceeds 410 on this moment. On top of that nearly every Directive has a separate explanatory memorandum at the bottom of the Directive which contains an explanation, and - in a lot of cases - some illustrations. The bare text of the Directives covers

more than 200 pages. The sheer size of the Directives limits the accessibility and constitutes a serious inhibition for the users. This circumstance makes it quite difficult for legislators (even experienced ones) to find their way through the new Directives during the drafting stage. An information system, it was felt, could be the way out of these problems. This meant the start of the LEDA-project.

3.4 The goals of the LEDA-project

The main goal in the LEDA-project was to make the information of the Directives themselves accessible in concordance with the information-need during the different stages of the drafting process. A secondary goal was to make the information, referred to in the Directives (secondary information), available to the users. Many Directives, as it happens, do not prescribe what the solution should be in a certain factual situation - as is often the case with ordinary legal rules - but rather prescribe which activity should be undertaken at a certain moment, and what kind of information is needed to be able to perform the prescribed activity. The third goal of the LEDA-project was to offer knowledge-based drafting-support on the basis of the legislative knowledge within the Directives, pursuant to the knowledge-based access of the information from the Directives.

To be able to do this an analysis of the drafting process itself was made, and an analysis of how the different Directives should be used during the different drafting stages (a so-called activity and information analysis). The model of the drafting process as the result was subsequently represented to the system. The modelization of the drafting process constitutes the back bone of the LEDA-system. All functionalities and attributes of the system are connected to it.

4. THE LEDA-SYSTEM: HOW DOES IT WORK?

4.1 The LEDA-system's functionalities: general features

The LEDA system offers three major functionalities: methodological support, document-drafting and document-assembly support, and knowledge-based information retrieval. The combined functionalities make LEDA an integrated authoring system, *i.e.* an IT system which assists users in solving legislative problems on the basis of legislative information and, moreover, the system supports its users in authoring a legislative document which meets with the requirements of the Directives. Technically, the LEDA system is a hypertext network which allows for different kinds of navigation and working patterns within the system.

The support offered by the LEDA-system is, though practical, very modest in nature. LEDA assists in the prestructuring of a draft by offering a drafting method to the user which consists of a set of drafting levels. These drafting levels - which act as transgressable layers in an edit-field - contain important information - mostly derived from the Directives for Regulations - about legislative quality requirements to be considered within a particular drafting level. The information levels correspond with different possible substantial and structural elements within a draft. For instance LEDA harbors levels like 'definitional clause', 'attribution of administrative authority', 'Prohibition-permit systems', 'supervision (model) clauses', 'sanction systems', 'transitory regime', etc. etc. LEDA in its present form consists of 54 of these levels for the drafting module alone. Users do not need to use all of these levels: they are invited to make choices which alter the number and order of the LEDA-information levels. By tailoring the information environment LEDA tries to address the particular information need within a particular drafting project.

Combined, the drafting levels constitute a semantic network which can be navigated at random. By progressing through the network of levels a LEDA-users is confronted with

documentary information and active checklists, which when used or filled out, procure the main building blocks for a draft. These building blocks can be edited at will while working with LEDA: the system is designed as a plug-in in MSWord 97.

The LEDA system is mainly an informational skeleton, which guides its users through drafting new legislation. The system functions predominantly as an elaborate legislative guide, for it contains a lot of Directives that should be observed during the different stages of the drafting of a bill. In addition LEDA possess a functionality which makes it possible to analyse a draft text dynamically in order to see which Directives are relevant. To be able to do this LEDA is able to recognize drafting-concepts in the draft text (*e.g.*, formulations used to delegate or sub-delegate powers). Once these concepts are recognized by LEDA, the systems connects (by means of hypertext) the analysed text fragment to information leaflets corresponding to the drafting-concept in question.

LEDA's functionalities are integrated throughout the system and organized in two major modular components. LEDA consists of two major modules called the Preparatory (policy) Module (Pmodule) and the Basic Design Screen (BDS)

4.2 The Preparatory Module

The preparatory module in LEDA offers knowledge-based access to the Directives concerning substantive, methodological and structural design issues, in a way consistent with the chronology of events in the drafting stage. The Preparatory module of LEDA permits the user not only to draft a preparatory document (e.g. a policy memorandum), but also supports the creation of a skeletal form of a draft, which can be used as the basis for the actual structural design and formulation of a draft for which the BDS-module is the dedicated platform. To this end the Preparatory Module guides the user through a hypertext network of semantic hierarchical and referential links. To offer guidance, the hypertext network of the PM is divided into different levels, corresponding with the different methodological steps of the design-step-model derived from the Directives. The levels in their turn serve as a checklist, expressing important points of attention regarding methodological and substantial aspects and the structural design of a draft. Figure 1 shows how the P-module and the BDS-module are interconnected.

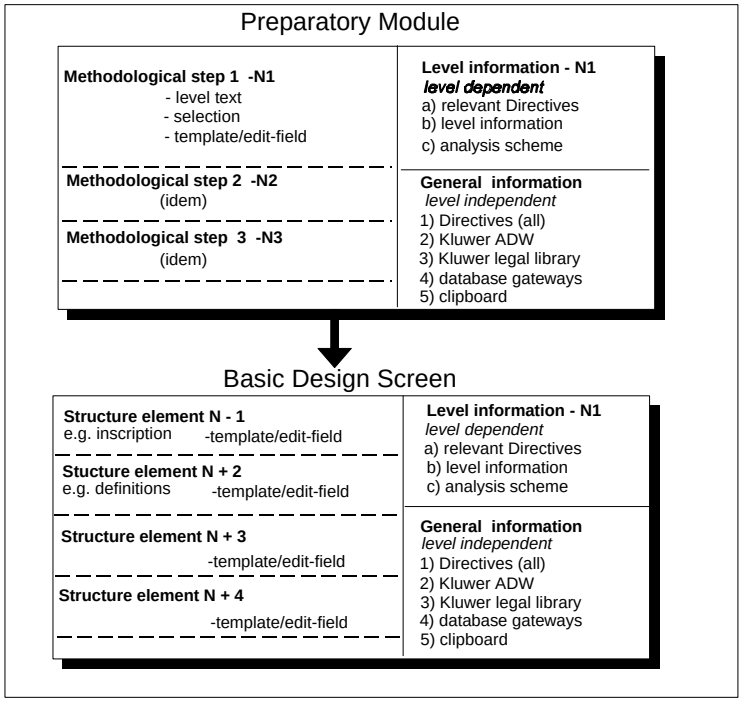

Figure 1: Interconnection between Pmodule and BDS

The Preparatory Model consists of various methodological and consecutive levels (dotted lines on the left hand side in figure 1). These methodological levels are referentially linked with level information (box at the upper right hand side). The level information component consists of (access to) the relevant Directives, access to relevant secondary information (as referred to by the relevant Directives), and a graphic template-scheme for user-analysis of certain options. Level information changes according to the level which is active (i.e. the level in which the user is working).

The methodological levels themselves consist of fields containing information (about what is to be done within a certain level) and knowledge-based templates. The level-template-documents which mainly serve to insert (or draft) text, also support the identification of important sub-items, and the choice between options. Both on the basis of the choice of the user and automatic analysis of text-input in the template, the system makes inferences regarding the arrangement of levels further down the network's path (e.g. the arrangement of the levels in the Basic Design Screen). From the point of view of the user, the levels form an interactive word-processor which provides methodological guidance and provides relevant (semantically interlinked) information, in the form of authoritative arguments.

The user may progress randomly through the level-structured hypertext network. This fundamental openness of the system is necessary as the user-legislator is always free) when drafting a legislative text without the use of the system) to deviate from the Directives themselves whenever there is a good reason.[7] To accommodate reluctant users, there is even a possibility of to shut down the levels altogether. What remains is a word-processor linked to

7 See directive 5 of the *Directives for regulations*.

information in a single default-information level explaining the methodological approach of the Directives, and providing (links to) the relevant Directives and secondary information. To prevent getting lost in the hypertext network, user-guidance is provided by the levels themselves, together with easy backtracking procedures and a step tracer, which consist of a major and minor active compass which visibly records the path hitherto followed in the network. On top of this the Pmodule is provided with a General Information-component to offer non-hypertextual access to various internal or external databases. Users can retrieve text from these databases while working in the different levels. The text in the internal databases, however, is hypertextually linked.

4.3 The Basic Design Screen

The Basic Design Screen Module (BDS) is developed and structured in a way very similar to the Preparatory Module. Like the Pmodule it consists of a level structure, linked with level information. The levels (see the dotted line in the BDS-module of figure 1) contain templates mainly consisting of free-text fields, which allow system supported insertions (e.g. of model clauses or examples). The templates within the levels of the BDS however do not express points of attention with regard to the preparation and structural design, but important phrasing, terminology and terminology-related (substantive) issues regarding the structural elements of a draft. The arrangement of the levels in the BDS is both based on knowledge (gained from the Directives) and knowledge-based inferences made by the Pmodule. The BDS itself can be regarded as one large knowledge-based template which is shaped and directed by the Pmodule. The BDS represents the preferred structure of a draft, modelled to the needs of the user.

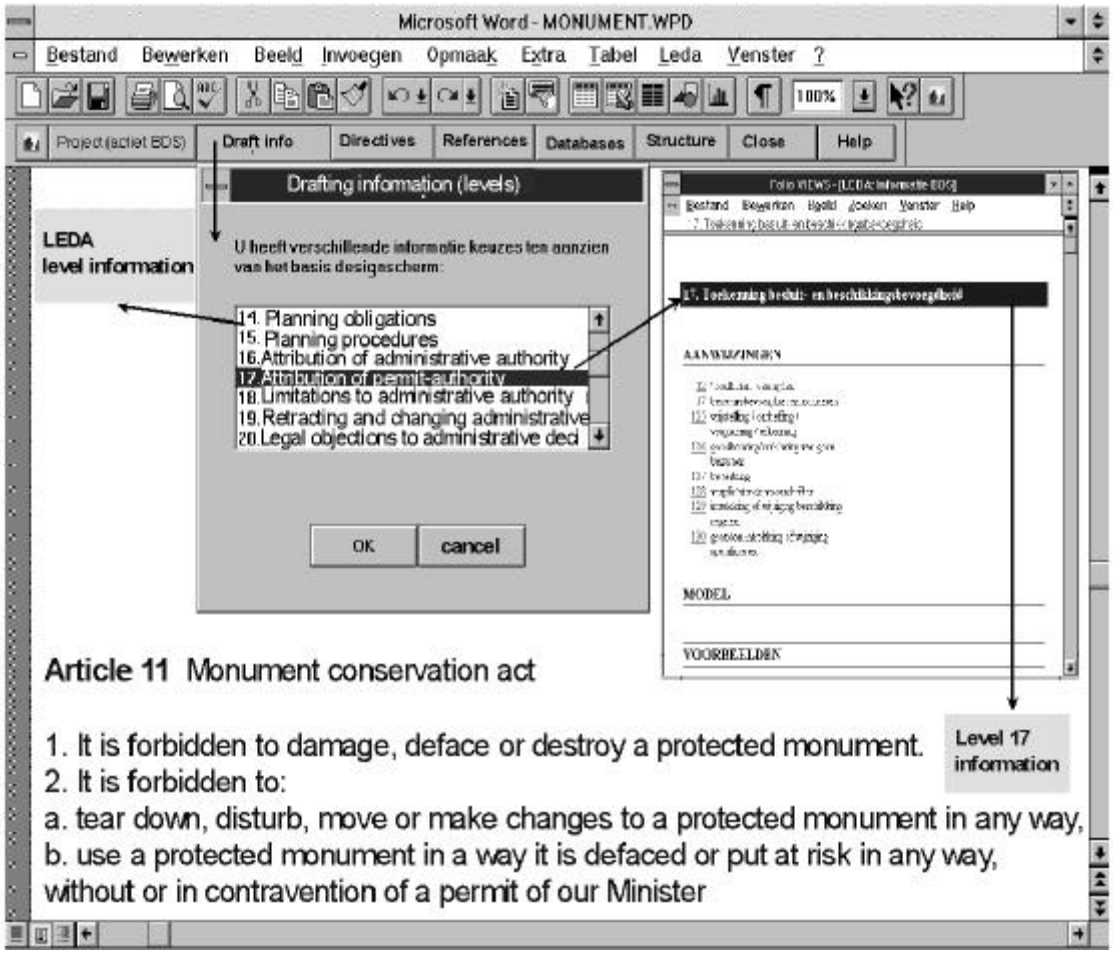

Figure 2: The BDS-module at work in its MS-Word environment

Like the Pmodule the BDS has a very open structure: the user may progress randomly, do away with the levels altogether and receive default-information, and delete or add certain levels. The user-guidance function is similar to the one in the Pmodule. The BDS has, however, one distinctly different feature compared to the Pmodule. It possesses a conceptual dependency parser.

4.4 The CD parser

When a user has finished the drafting of a text (within a certain level of the BDS), he may be interested to know whether he has overlooked a relevant Directive. In other words did he/she overlook a high an authoritative or high ranking argument? To accommodate this interest LEDA possesses a conceptual dependency parser (CDP). This CDP automatically analyzes (parses) the user-inserted text in a BDS level and dynamically creates links to a particular concept in the database or a the text of a Directive if the text-analysis indicates the relevance. To be able to do this the CDP not only detects key-words and key-word-combinations and matches them with patterns in the database (string matching), but also analyzes concepts in text sentences (by using the linguistic conceptual dependency method and matches them with concepts in the database (so called: automated conceptual information retrieval). The CD-parsers functions as a sophisticated legislative spell-check. However, instead of finding miss-spelled words, marking them and offering alternative, correctly spelled words, the CD-parser of LEDA only marks points of attention in a draft bill and offers Directives and other information that can be of use to the user. This form of conceptual dependency parsing combined with automated conceptual information retrieval is very powerful because both the concepts in the level-related text and the concepts in the database can be quite accurately defined. In combination these functionalities offer a dedicated and semi-intelligent legislative proof-reader.

5. CONCLUSION

The information-oriented approach to the development of practical legimatic systems seems to pay off. LEDA is being used in the actual departmental drafting process in the Netherlands. LEDA recently has been evaluated with good results and a commercial version was made available for all Dutch ministerial departements with legislative drafting responsability this year (2000). The LEDA approach is being adopted in similar projects in Australia (Enact),[8] Italy (Lexedit)[9] and Belgium (Solon)[10].

By pre-structuring the draft-process and offering knowledge-based access to relevant (authoritative) information systems like LEDA are first steps on the way to really intelligent drafting support systems that will mimic legislative reasoning in it's full complexity by using AI-techniques. AI-based tools will, in the near future, dramatically improve the functionality and the quality of existing legimatic information systems like LEDA. The AI-approach bears a lot of promise when it is combined with the results of the information-oriented approach. Legimatic AI-tools, suitable for consistency checking and considering the deontological consequences of a draft,

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8 See T. Arnold-Moore, *Information Systems for Legislation*, PhD-thesis, Royal Melbourne Institute of Technology (Melbourne 1998).

9 See Carlo Biagioli, Pietro Mercatali, Giovanni Sartor, Legimatica: dal drafting al processo di produzione legislativa, in: Carlo Biagioli, Pietro Mercatali, Giovanni Sartor (eds.), *Legimatica: informatica per legiferare* (Napels 1995).

10 See R. Van Kuyck, S. Debaene en B. Van Buggenhout, B. Solon - A computer aided statutory drafting system for the Flemish government, *Conference Proceedings of the Fifth International Conference on The Law in the Information Society* (Istituto per la documentazione giuridica del CNR, Florence 1998 CDROM)

will not only be able to improve the quality of drafting support systems, they can also initiate a new way of thinking about legislative quality and kick off new approaches to legislative drafting.[11]

This combination of drafting support and purely AI-based legislative analysis and review systems is, however, for the moment, blocked by the necessity of - user unfriendly - complex knowledge representation and formalization of natural (draft) language to accommodate analysis and review systems.

Systems like the LEDA-system in their turn may affect the drafting process in numerous ways. First of all, through its functionalities, the system accelerates the pace of legislative drafting and may indirectly contribute to the improvement of the quality of legislative drafts by way of forcing attention to the requirements the Directives for Regulations. Furthermore, systems like LEDA can contribute to the emancipation of legislative expertise for members of Parliament or legislative laymen by making legislative drafting, hitherto the realm of professional legislative draftsmen within ministries, transparent and easily accessible. Legislative knowledge itself will benefit from this. The drafting knowledge in LEDA will more and more become a mutual point of reference for those concerned with legislation. Using LEDA as a platform for the how and what of legislative drafting, legislative actors will feed and extend the body of legislative knowledge by their inevitable discussions on legislative topics. New experiences and insights in legislative drafting can very easily be added to the 'knowledge-base' of the system.

Working with IT drafting systems like may in the long run even give cause to re-think and re-model the legislative process itself. Legislative processes are until now very paper-oriented and sometimes cumbersome due to the need for communication in writing between the legislative partners involved. The introduction of IT systems may well alter the paper-based rationale of the legislative process and replace it by a much faster digital process. In any case the rationality of legislation may improve by using IT-drafting systems, but whether this will be the case is - now like before - totally dependant on the legislative operator sitting at the other end of the keyboard.

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11 See R.W. van Kralingen, W. Voermans, Bringing IT-support for legislative drafting one step further: from drafting support to design assistance, in: M. Gawler (ed.), *Artificial Intelligence & the Law ICAIL-97*, June 30 -July 3, p. 49-53.