A Role for Legal Expert Systems

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1. A Definition

When originally conceptualised in the 1970s, expert systems were thought of as an alternative to the human expert. Overwhelmed by the huge potential which the knowledge representation within computers gave them, scientists believed that as technology advanced it would become possible to replace the human expert with an electronic one. Developments in the field of Artificial Intelligence (AI) though, show that even more modest targets cannot be achieved and that the kind of expertise provided by an expert system can only be used as some kind of secondary support to the human one.

The definition of legal expert systems relies on the fulfilment of a number of criteria. According to Oskamp [Oskamp 1990,1992] a system has to contain the same knowledge of a particular legal domain as a human expert has. Thus, according to the classification of legal knowledge, there can be various categories of expert systems i.e. labour law, maritime law, etc. The pieces of knowledge have to be connected to each other so that the system can reason like a human expert. Simulation of the expertise humans possess can be achieved with the use of AI techniques. That results to better resources management. It also makes it possible for the system to reason on a particular conclusion by referring to legal sources it used [Reed 1990].

Early expert systems promised to cover large areas of various disciplines where the expertise could be represented in a computer executable program. Such programs could be copied and related applications could be widely distributed. The incentive was great and even non-computing disciplines – such as law – felt the shock wave of this new idea and much enthusiasm for legal expert systems was generated [Leith 1991]. The idea that law was of a rule based nature just like expert systems created the false impression that «it is just a matter of getting a group of lawyers off for a weekend together» (Leith [Leith 1991] quoting a senior figure of the UK government).
Many believed that a legal expert system could indeed become reality. On the way though some realised that:

[expert systems]...are not as intellectually powerful as they were first thought; it began to be seen that they cannot really deal with «common-sense» reasoning at all. Further there seemed to be a real problem in moving the systems from laboratory over to the real application world when the umbilical cord between the laboratory and the system in the real world is cut, these systems often fail, and lie unused [Leith 1991].

2. Drawbacks of the Application of Expert Systems

A typical example of a legal expert system is the «Latent Damage System» which was launched in the UK market in 1988 [Capper et al. 1988]. The system provides expertise on a part of construction law. Although it is called an expert system, it does not succeed in replacing a human expert completely. The system is more suitable for lawyers or users with a legal background than for use by non-experts. The Latent Damage System relies on the interpretation of the Latent Damage Act as given by its two authors. The developers of the Latent Damage System refer to it as an intelligent assistant for already knowledgeable users [Susskind et al. 1989].

Expert systems such as the Latent Damage System can cover a very small, not very demanding and quite confined field of law. They cannot interact with other related fields of law. Consequently, it is not possible to suggest that legal expert systems can be implemented in a way that is suitable to combine knowledge deriving from various sources, such as norms, procedure rules, empirical knowledge, etc. [Konstantinou et al. 1993]. Expert systems are not expected to be able to solve complicated cases and propose integrated solutions that involve the combination of knowledge from different legal fields.

Expert systems do not offer their users unprocessed legal material. In order to fulfil their purpose they contain legal information such as statutes and case law which have already been interpreted. Information provided by expert systems has been subjected to the human expert process which means that the impartiality of the raw legal information has been lost. Even when strictly controlled, the processed legal information cannot be quite accurate over a period of time or when conditions change. Consequently, legal expert systems need constant attention in order to be kept up-to-date and distributed to their users.

Legal expert systems cannot be used in full scale real-life applications because they lack a reliable knowledge acquisition mechanism which would
permit them to be enriched with new data received from interaction with users. Although lawyers’ work is based to a great extent on knowledge that they have already acquired they are always in a position to obtain new knowledge if conditions become more demanding [Morison et al. 1992]. In the case of legal expert systems, however, the knowledge base is the only source of information about the real world. Anything that falls outside of it cannot be processed. It has been estimated [Reed 1990] that about 90% of cases could be successfully resolved by an expert system. These are cases which can be clearly accommodated within the limits of the application of clear legal rules. However, this still leaves 10% unresolved, a higher failure level than that of a human expert. As long as such a knowledge acquisition mechanism cannot be implemented successfully, any new data has to be funnelled in by the developer of the system. In practice, many problems are related to the updating of the system and the lag in the distribution of new versions brings the widespread use of these systems into question. The impact of the delay can be more serious in common law systems where case law plays a more important role. The delay in updating of old versions of a system may lead a human expert, who relies on one, to draw wrong conclusions about a given case.

One objection to the possibility of using expert systems, able to cover large areas of law, lies in the tremendous volume of legal material, particularly court decisions. In relation to the current state of development of expert systems in the US, Maggs [Maggs 1994] notes:

The basic source material in one area of the law, such as tax, environmental law, or securities regulation, run into hundreds of volumes of text. Each of these areas grows at the rate of dozens or more volumes a year. There are not enough skilled specialists to code new material as it appears, let alone to deal with the backlog, nor is there any workable method of turning the unstructured information in court decisions into completely formalised rules.

He suggests that only in small confined sub-sections of law, which are highly structured and widely applied, could an expert system eventually be of some practical use. As an example of such a subsection he points out income tax law. Tax laws have the advantage that they are more precisely defined, they concern a narrow domain and they are relatively carefully drafted [Konstandinou et al. 1993].

A more general drawback which is related to the use of computers is the language of communication. A user is obliged to use a combination of yes/no answers. Such an interaction limits the user friendliness of a system and it confines its use within the circle of legal experts, who are already familiar with the use of computers.
Legal information stored and formalised in a knowledge base seems quite manageable but to what extent can it cover the factual element of a case? How well can an expert system developer foresee possible scenarios in order to incorporate them in his/her system? Are we aware of all the parameters of a legal action? Do we fully understand all the apparently unimportant side issues of a legal action? Is it possible to formalise this unstructured side of legal practice in order to give it a computer readable form? Our low level of understanding makes it necessary to study such parameters before putting expert systems into practice. De Mulder [Mulder et al. 1992] argues that:

For a long time in the field of legal science there was practically no knowledge available that was based on and had been tested against empirical data. The study of law could scarcely be called scientific education, it was a proficiency training which taught future Lawyers how to behave in legal practice.

It seems an impossible task for one expert or a small team to foresee all the possible cases which can come up after a statute is implemented. If they could do so they would be faced with the reality of incorporating the facts of each case for which an expert system could be expected to answer. Developers of expert systems must take into account the nature of law which is based on social reality.

Law falls like a fine tissue on the social surface and it follows all its changes. As long as statutes and case law are subject to continuous change, it is impractical to talk about replacing a human expert with an electronic one who will be unable to interact directly with the social reality. It would be a contradiction to produce a system advanced in terms of computing techniques but outdated in terms of social update. It was probably such considerations which led the developers of the Latent Damage System to tone down the description of their product. It has finally received the title «Latent Damage Advisor» and according to a description it is:

a system that is not constructed for robotic use, but it requires legal judgement at each stage, and therefore it is a decision support system rather than a decision making one [Paliwala 1991].

3. Future Use of Expert Systems

Controversy about the use of expert systems in law should not lead to the premature conclusion that AI techniques cannot be used anywhere in
the legal domain. There are indeed ways which can help us to improve our understanding of the law and perhaps allow us to formalise this knowledge in a computer readable form. De Mulder [Mulder et al. 1992] suggests that the use of empirical methods in law can give us a better insight into how law works. It is the scientific analysis of the legal field described by Loevinger as jurimetrics in an article in 1949 that can provide us in the long-term with the empirical knowledge necessary for building legal expert systems closer to the social reality. Jurimetrics according to De Mulder [Mulder 1984] is:

the empirical science which concerns itself with the study of syntax, semantics and pragmatics (and the relationships between them) of demands and authorisations issuing from state organisations.

Morison [Morison et al. 1992] makes a point about the issue of the study of law with the use of scientific methods claiming that we know very little about the way lawyers work or law works. When attempting to build an expert system there are usually two factors taken into consideration, legal norms and facts. However, before accomplishing a legal action a lawyer has to take several steps. While a law suit is in process, there are numerous factors which have to be taken into consideration in order to safeguard the integrity of a legal action. Most of them have very little or nothing to do with the facts or the application of clear legal rules. They all influence a legal process not always in a straightforward manner like the one which is described in a textbook. Morison [Morison et al. 1992] notes that there are social as well as personal factors which have an impact on a legal process. The following are only a few of the often underestimated parameters of a legal process. The cost of an action is sometimes forgotten. If resources are plentiful one may carry on with an action although the counsel’s advice would be to pull out. The adequate description of the case by the client (or the solicitor if there is one), the evidence that can be provided and the quality of a witness, instinct and experience in handling a particular kind of case, merits and their relationship to legal elements, the behaviour of a judge and possible personal acquaintances, or the personal ambitions of a lawyer are all factors which can have quite a strong influence on a process. This kind of influence has not been measured and studied in order to become formalised and used in a computer readable form. If it is actually possible to study and measure the influence of factors such as the above mentioned, there is a chance that in the future legal expert systems could become adequate for resolving cases more
accurately. Empirical research in law can come up with interesting results which can help us understand in depth the function of law as a social phenomenon.

As long as full scale applications of expert system cannot be implemented it is better to look for other uses of expert system related techniques. There are a number of law related activities in which such techniques have a role to play and where research has come up with some interesting results. As such we can point to the use of AI related techniques by para-legal services, by experts who seek a decision support system and by law makers for drafting legislation.

3.1. Legal Advice Systems

A more realistic approach for computer applications in law is the legal advice systems. They promise to maintain a closer and more direct relationship between the system and the users. Legal advice systems are designed to:

advise legal users about a specific legal subject on the basis of day to day legal proficiency. An important starting point for this kind of system is that it is a means for legal authors to convey their opinions to the users. The term «opinion» is used deliberately. This is to emphasise the difference between empirical knowledge (that can be tested and falsified) and the kind of practical knowledge lawyers have, that cannot be tested and falsified. [De Mulder et al. 1989]

JURICAS (Juridical Computer Advice System) is an example of a legal advice system. It has been developed at the Centre for Computers & Law of the Erasmus University, Rotterdam. A number of programs prepared by lawyers in specific areas of law have already found their way to the market. Additionally a user can get the «empty» shell if he/she is interested in constructing his/her own program. Legal advice systems based on JURICAS and covering parts of inheritance law, dismissal law, military conscription and so on have been used by lawyers and para-legal services in the Netherlands for the last few years. What JURICAS systems do so successfully is that they offer advice based on small and very carefully selected sections of the law. Usually the issues they deal with are of a technical and complex nature. The JURICAS packages are not built to offer a decision making tool but rather a decision support one. The information provided by the system is always subject to the evaluation of the user who can accept it or not. In
relation to the task of the developer of a JURICAS package van der Wees [Wees 1993] notes that:

In an advice system it has to be clear to whom the advice is directed; a judge, a public prosecutor, a defending council or another interested party... A lot of efforts is necessary to explain what exactly is meant by certain words and expressions.

The producers of JURICAS by no means claim that their system can be a panacea to all legal problems which can fit in it. However, it has proved to be quite a useful tool for the routine work involved in several professions such as drafting letters, text, contractual conditions and such. JURICAS systems are useful in classifying knowledge in new fields of law where no information has been published.

3.2. Legislation Drafting

In the past years there has been an increasing demand for improvement in drafted legislation. AI techniques can help the rationalisation of drafting legislation which would result in reducing the number of conflicting rules in it. As a result one could expect a higher level of administrative efficiency and a fall in the number of cases which end up in court. Eijlander [Eijlander 1993] suggests that knowledge based system techniques can help in drafting legislation in several ways such as the following:

a. Computer technology can make it easier to access and apply established knowledge and scholarship in the legislative field. This in turn can make it easier to apply tried-and-tested working methods...
b. Computer technology – possibly in the form of custom-built systems – can make a major contribution to improving communication and information exchange in the legislative process, thereby making the drafting process more transparent and easier to monitor...
c. Computer technology can make relevant data and information more easily accessible...
d. Task oriented computer technology – especially in the form of knowledge-based systems – can make it possible to check for consistency, both in and between individual pieces of legislation...

Voermans [Voermans et al. 1993] takes the view that unlike other kinds of legal applications, expert system techniques could be of some assistance in the process of drafting legislation. He claims that what is required is
mainly widely accepted facts, political, economic and social science reasoning. Due to the complexity of the process it is usually not certain that a particular bill will be appropriate to regulate a case. The application of legal requirements does not automatically procure appropriate bills. Here is a place for the application of AI techniques, which can be useful in a few carefully selected law drafting activities.

One such application is Leda (Legislative Design and Advisory System) which has been developed at Tilburg University for the Dutch Ministry of Justice. For the past few years legislation drafting in the Netherlands has been based on a set of recommendations which can guarantee the quality of the draft. The «recommendations for regulations» consist of 346 directives and guidelines on issues related to legislation drafting. Although they are not strictly binding they contain an assortment of legal rules, best practices and criteria for quality drafting. The Leda project was set up in order to make the recommendations as well as other information accessible in the course of the legislative process. What Leda offers is methodological support, document drafting and assembly support, information retrieval and legislative advice.

4. Conclusion

The apparently rule-based nature of the law led some to assume that legal expert systems would have enormous potential in the legal world. Since the development of these systems, many of the myths about how law works have been reviewed, reconsidered and many of them rejected. However, it is the legal rules and their interaction with the social reality which have to be methodically analysed in order to understand law better. Law is a social phenomenon of a complex nature. Its role is so important that it is unfair and inaccurate to reduce it to the rule and fact model. Research and analysis of the legal reality are necessary in order to acquire a clear insight into law and how it works and corresponds to social phenomena. Until then, AI techniques cannot be implemented in the production of real-life expert systems. Their role has to be scaled down to the methodical construction of legal applications for a practical purpose which can increase efficiency, such as support tools for drafting legislation, advisory systems.

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REFERENCES


