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An Expert System for Improving the Pretrial Release/Detention Decision

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Abstract: This paper raises the issue of whether computer technology can contribute to improving the quality of pretrial release decisions. Guided by a variety of legal expert system developments, the paper identifies and explores the special problems associated with constructing an expert system to guide the pre-trial release decision maker. Of particular interest is the question of whether the outcomes of prior release/detention decisions can be captured and used by the expert system to improve the accuracy of the risk (of flight or reoffending) assessments.

Special Legal Characteristics ot the Bail Decision Domain

The builder of a legal expert system needs to construct a knowledge base of the rules that inhabit the domain. If the decisions of the expert system are to be credible, the sources of the rules must be relevant, accessible, authoritative and citeable. In legal systems, the usual sources of choice are legislative and judicial materials.

However, the bail decision domain differs from many legal domains because it involves neither an intricate set of prescriptive legislative rules nor a well-established network of judicial rules. In addition, unlike some other legal domains, the bail decision domain includes a large component of discretion (which requires the decision maker to select one correct answer from a range of correct answers). Finally, because the bail domain involves a risk assessment, the correctness of the bail decision can be evaluated against the domain rules and against the factual outcomes.

As a result, the bail decision domain presents some special problems which warrant careful consideration.

Legislative Rules in the Bail Decision Domain.

The Bail Act provides the logical first source of rules for the bail decision expert system. Although common law legal systems are said to be cased-based legal systems, legislation has long since ceased to play a subordinate and incidental role in the development of legal policies and rules. As a result, legal expert system builders have been exploring legislation-based as well as case-based expert systems (Kowalski 1989; Kowalski 1987; Rissland 1989; Sherman 1989).

The mere existence of legislative rules does not, however, ensure that an effective expert system can be built. The legislative rules need to have a variety of specific qualities in addition to their existence in order to provide a hospitable environment for the construction of an expert system. The Bail Act has some, but may not have all, of the needed qualities.

Because an expert system has to be limited in its scope, a small domain is preferable to a larger one. The Bail Act which takes up just a few pages in the statute book creates a relatively small domain, at least in comparison to the British Nationality Act which takes up eighty pages and is the domain of another expert system (Kowalski 1987).

Also relevant is the extent to which the domain interlocks with other domains. Where problems in the domain can be solved only by reference to rules outside of the domain, one strategy is to enlarge the system to encompass the relevant rules in the interlocking domains; this solution can result in an unmanageably large system.

A second strategy is to treat such problems as unsolvable; this solution may be acceptable where the incidence of such cases is relatively small, but not where the incidence is large The use of the unsolvable problem strategy in interlocking domain cases is complicated by the difficulties involved in making sure that the system knows when a problem case has gone beyond its expertise.

The Bail Act provides an excellent domain with regard to this quality because its rules for making bail decisions are entirely self-contained and no forays into other domains are required.

Another important quality in a domain relates to the prescriptive character of the legislative rules. All rules contemplate that some human agency will implement them (Susskind 1987, p.175).

But the standards specified in the legislative rules do not always explicitly state all of the parameters of the relevant implementing action. Compare, for example, a traffic rule which says, "Do not drive faster than 60 miles an hour" with one that says, "Do not drive too fast."

The '60 miles an hour rule' is self sufficient in that it can be implemented without resort to other sources. The 'too fast' rule, on the other hand, requires the human agency to go outside the legislative rule for guidance in deciding what speeds are 'too fast' and what speeds are not 'too fast.'

The Bail Act has some provisions which are not self sufficient. For example, it provides that an accused has a right to release pending the disposition of the charges, unless "there are substantial grounds for believing" that the accused will flee, will commit another offense, or will interfere with witnesses.

The Act does not specify what constitutes relevant "grounds for believing"; nor does it specify the circumstances under which relevant grounds cross the line from being "insubstantial" grounds to being "substantial grounds".

In many cases, the unspecified parameters in the legislative rule are supplied by judicial rules. Sometimes the judicial rules are already in place when the legislation is enacted and the legislation in effect incorporates the judicial rules by reference. For example, the concepts of "proof beyond a reasonable doubt" and "proof by a preponderance of probabilities" have long judicial histories. So legislators can refer to one or the other of the burdens of proof without further explanation.

Some of the unspecified parameters in the Bail Act provisions are identified by language of a kind which, in some cases, is associated with existing elaborate networks of judicial rules. For example, the phrase 'substantial grounds to believe' is analogous in some respects to the phrase 'probable cause to believe'; but the latter phrase has been subjected to extensive judicial rule making and the former to almost none.

Nor do existing judicial rules offer much help in defining parameters such as the accused's character or prior record. While these parameters clearly identify the factor to be considered, neither tells the decision maker the point at which evidence about the factor (either alone or in combination with other factors) crosses the line from mere grounds to believe, to 'substantial grounds to believe.

In cases like the Bail Act where unspecified parameters do not incorporate preexisting judicial rule, the gaps in the legislative rule can be filled by subsequent judicial rules. In the case of the bail decision domain, however, subsequent judicial rules have not materialized.

So, the bail decision domain has some legislative rules to contribute to an expert system. As far as the legislative rules go, the domain has the desirable characteristics of being small enough to be manageable and of being quite discrete from other domains. On the other hand, some of the domain's legislative rules present the difficulty of having unspecified parameters.

The challenge of the domain will be finding an appropriate way to specify the parameters. The next section examines the role of judicial rules in the bail domain to see why judicial rules have not taken on the task of specifying the parameters.

Judicial Rules in the Bail Decision Domain.

Legal systems based on the common law tradition are stereotypically said to rely on 'case-based' reasoning. This means that the outcome in an individual case is generated by the interplay between the facts of this case and the rules generated in past cases.

The power of the past case rules (or precedents) over the present case comes from the common law doctrine of stare decisis. This doctrine promotes predictability and stability by providing that established case rules should govern new cases unless significant factors justify disregarding the established case rules.

The stereotype of case-based or precedential reasoning, while generally valid, does not apply with equal force to all legal domains. The bail decision domain is one in which case-based reasoning has a very limited impact because the usual mechanisms for accumulating and refining judicial rules do not operate in the case of the Bail Act. As a result, the number of case based rules is extraordinarily small.

Under stare decisis, earlier case rules should be given weight in the decision of the current case. However, the amount of weight to be given the earlier rule varies according the relationship between the court making the earlier rule and the court deciding the current case.

Courts are arranged in a hierarchy which gives some courts (called appellate courts) the power to overrule the decisions of lower courts (such as trial courts). Normally, as a matter of practicality as well as a matter of stare decisis, a court making a decision in the current case will carefully follow any earlier rules made by courts situated above it in the judicial hierarchy.

In the bail domain, the number of higher court rule making decisions 15 minute because trial court bail decisions are very rarely appealed to a higher court. In part, the low number of ball appeals is attributable to the fact that appellate courts require a very strong showing of lower court error before

they will overrule the lower court. In part, the low number reflects the defense lawyer's judgment that limited defense resources should be spent on the merits of the defense rather than on unlikely appeals.

In the absence of higher court rules, a court may elect to rely on earlier rules made by courts on the same level of the judicial hierarchy. Such reliance would be comparable to the reliance by arbitrators, who are not bound by stare decisis, on previous arbitral rulings which are well reasoned or issued by a respected arbitrator (Lambert 1989).

However, for such rules to be considered, they must be accessible. Accessibility turns, in the first place, on whether the rules which explain a bail decision are announced. The general practice in ball decision cases is for the decision to be announced without any identification of the rules and the reasoning which contributed to the decision. So, relatively few bail decisions contain the kind of information necessary for the rule formation process.

Accessibility turns, in the second place, on whether the announced rules are preserved in written form. The bail decision maker is usually faced with making multiple bail decisions in a limited amount of time at each court session, and so doesn't have the time or energy to write down the reasoning behind each decision. Observers sometimes record the announced rules in major cases, but such rules are rarely recorded in routine bail cases. So, very few bail decisions are in a form which facilitates their collection.

Accessibility turns, finally, on the publication of the recorded decisions in a form which enables them to be found and consulted. While some trial court rulings are available in print or electronic databases, most are not. Bail decisions are one category of trial court ruling that is almost never reported. In this respect, the bail domain is different from the employment arbitration domain which had few case rulings but sufficient numbers of arbitral opinions to provide an alternate source of domain rules (Lambert 1989).

Without earlier court rules to work with, case-based reasoning can not, and does not, have much influence in the bail decision. As a result, the expert system for the bail domain will encounter some problems not shared by other expert systems in legal domains.

Other Rule Sources in the Bail Decision Domain.

In addition to looking at judicial and legislative sources of knowledge, an expert system builder may have secondary sources available for consultation. Secondary sources may take the form of treatises (comprehensive expositions of the target domain) or of articles (usually containing expositions of a portion of the target domain).

The bail decision domain is one which is very well populated with treatises and articles. However, the contribution of secondary sources to the rule base of the expert system will be modest. The limited supply of judicial and legislative source materials has the effect of limiting the scope of the secondary source exposition of judicial and legislative rules. Although the rules derived from experiential knowledge (Susskind 1987) are more extensively treated in the bail domain secondary sources than in secondary sources in many other domains, the total contribution of such rules to the exposition is relatively small because of the special role of discretion in bail decisions.

The Special Role ot Discretion

As indicated above, the bail decision domain is one which has relatively few rules (even when all judicial, legislative and experiential sources are consulted). In addition, it is a domain in which many

of the rules have imprecise parameters (deny bail when there are 'substantial grounds') or no parameters (consider the accused's character). The combined impact of these characteristics is that the decision maker is free to select any decision that is within a range of acceptable decisions.

The process of selecting one acceptable decision from among a range of acceptable decisions is called 'exercising discretion.' Discretion is introduced into a decision making process in order to prevent the mechanical application of rules. The provision for discretion is particularly appropriate where the range of possible decisions is wide, or where the differences between individual decisions are graduated. So discretion is useful when the amount of a bond needs to be set (between, say, £1 and £1,000,000) or when the length of an adjournment needs to be set (between, say, 1 day and 180 days).

Unlike the bond and adjournment examples, bail decisions normally involve a relatively small range of possible decisions: release, release with conditions, detention. Of course, the variety of conditions that can be imposed increases the number of discrete options available to the decision maker. So, discretion is still useful, particularly in selecting the more appropriate of two adjacent options (such as, for example, release with a daily reporting-in condition versus release with a weekly reporting-in condition).

The flexibility which comes with discretion is supposed to increase the quality of the decision by permitting the decision maker to make adjustments in outcomes in response to factual differences which are too subtle, too varied, or too unexpected to be captured in a statute (or in a judicial rule).

The rules which govern the exercise of discretion include the rule that the decision maker must use a rational process to make the selection. So, decision makers are not allowed to use random selection processes (such as flipping coins) or arbitrary selection processes (such as selecting the same option every time).

In theory, the bail decision makers' selections are rational because they are based upon an acquired expertise about criminal types and their characteristics (Ervin 1971). The difficulty with the theory is that it has not been substantiated by studies of bail decisions (Stone 1988; Alschuler 1986; Ervin 1971). In some risk of flight studies, similarly situated accuseds have received significantly different bail decisions. In some risk of re-offending studies, the bail decision makers have accurately identified potential re-offending accuseds in as few as 5% to 30% of the cases.

Where, as in the bail decision case, the exercise of discretion results in substantial inequality of treatment for similarly situated persons, or in decisions which experience demonstrates are highly unreliable, the appropriate course is to provide rules which act as guidelines for the exercise of the discretion.

Using Experience to Construct Guidelines for Bail Decisions

One way to formulate guidelines which will constrain the exercise of discretion is to evaluate past experience. In many human endeavors, past experience of particular events is used as a basis for estimating the likely future course of similar events

In the case of bail decisions, the experience of flight and re-offending in past cases may be able to provide information that would be usef~ in constructing appropriate rules for assessing the risk of flight and re-offending in future cases. In other jurisdictions, empirical studies of bail cases by the Vera Foundation and by others have proved very useful in identifying factual factors which are reliable in predicting flight (Ervin 1971, p.295*).*

While comparable studies to identify factors which reliably predict the likelihood of re-offending

have been less successful, the studies have been able to provide other useful information. For example, the incidence of re-offending was found to be lower than had been estimated. In addition, the incidence of re-offending was found to be very low during the two months immediately after the charge was filed and during the period just before the resolution of the charge (Ervin 1971).

Once the value of using past experience as a source for rules is accepted, the difficult task of capturing the past experience remains. Section 7 outlines some of the options available for achieving this goal.

Capturing and Evaluating Past Bail Decision Experience

At the theoretical level, the process of capturing and evaluating past bail decision experience is relatively straight forward. Each accused is a 'case' which has a number of 'variables' (such as age, character, past record, and current charge). Each released accused has a flight outcome (the accused did or did not flee) and a re-offending outcome (the accused did nor did not re-offend). Standard statistical or Al techniques can be used to identify which, if any, of the variables are good predictors of each outcome.

This theoretically straight forward task is complicated by a variety of practical difficulties which need to be addressed.

One difficulty relates to the definition of 'past experience'. All of the questions that routinely arise in connection with the collection of relevant data become important. Is the data from each case to be collected? And, if so, for what time period? If a sample of cases is to be used, how big should the sample be? Does every crime and every locality need to be represented?

A second difficulty relates to the decision concerning how much of the data from each case needs to be collected. How much of the available data is relevant? If the accused's past use of an alias is a very good, but totally unsuspected, predictor of flight, a selective collection of data would not include the alias factor. On the other hand, an exhaustive collection of data would substantially increase the time, energy, and monetary burdens of the project.

A third difficulty relates to the practical task of collecting the data believed to be relevant. Since the data is not routinely collected by the criminal justice system, special arrangements for the data collection would have to be made. Special arrangements mean problems with expense, with coordination with the data holders, and with continuity, to mention just a few. On the other hand, if plans for the routine computer entry, storage and analysis of some data about pending prosecutions are implemented, some of the difficulties with data collection may be reduced (Greig 1991).

A fourth difficulty is caused by the routine incidence of inaccurate, incomplete, and unavailable data. The bail decision is made at the beginning of the prosecution when investigations are still ongoing. The data which has been collected about the accused is usually unverified and is often unreliable (Gibb 1990). Should the past experience analysis be based upon data of the usually available quality, or upon augmented data of a quality not usually available (Ervin 1971)? If the usual data is used, will the findings be reliable? On the other hand, if augmented data is used, how will the rules be related and applied to cases which do not have the data required by the rules?

A number of techniques for handling or minimizing the difficulties are under consideration. One possibility is to use the findings of past bail studies to construct a theoretical model of the rules thought to govern the risk assessment. the model could be used experimentally and modified to take into account the resulting outcomes. Another possibility is to explore the potential utility of artificial intelligence techniques for dealing with uncertainty (Fox 1987).

Whatever means are used to solve the technical problems, the identification of the good and the bad predictors will permit the formulation of relevant rules to be added to the rule base built from legislative, judicial and other sources. Rules formulated for variables found to have no predictive value are needed because the bail decision maker will find it as important to know what factors are not relevant to the assessment of bail risks as it is to know what factors are relevant.

Conclusion

The state has multiple interests in the quality of pretrial release versus detention decisions. A pretrial decision to detain an accused advances some state interests and retards others; the converse is also true.

The Bail Act attempts to balance the conflicting interests. However, a combination of circumstances (including the need to assess the risk of flight or of re-offending) complicates the application of the Act, and makes the quality of release versus detention decisions difficult to monitor and to control. As a result, the ability of the Bail Act to achieve an appropriate balance is hard to assess.

The goal of the bail decision expert system is to improve the quality of bail decisions. First, the system provides the bail decision maker with reliable rules for assessing the bail risks presented in individual cases. In addition, the system assists the decision maker through the multiple steps involved in the bail decision process. Existing systems have demonstrated that the use of an expert system in these ways will clarify the judicial decision making process without usurping the judicial function (Pethe 1989, Bainbridge 1990).

Although the bail decision domain has some characteristics which distinguish it from other expert system domains, the distinguishing characteristics do not seem to present difficulties which will prevent the construction of an expert system capable of achieving the intended goal.

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