New Tools for Reducing Civil Litigation Expenses

Mark A. Peterson
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New Tools for Reducing Civil Litigation Expenses

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1983
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Foreword

Most of us can readily understand how computers can help to cut the costs of making airline reservations, or keeping track of credit card purchases, or managing business inventories. We think of the computer’s strengths in terms of its capacity to record and count large numbers of items and transactions, each with clear-cut, specific, identifying characteristics.

But what can the computer offer to the subtle and often complex process by which civil damage claims are resolved? How, if at all, can it facilitate the assessment of legal liability, or the dollar valuation of damages, or the negotiating between the claimant and the insured? Is the computer’s role necessarily limited to keeping track of the number and status of such matters that are pending within a given company, or a law office, or a court? Or can computer-aided analyses offer more sophisticated forms of cost-cutting help to parties and their counsel?

This report examines four budding analytic techniques aimed at cutting the direct costs incurred by claim-handling and litigating institutions through imaginative use of the computer. All presuppose that the user would be a law firm bringing or defending against actions for civil damages, a court where many such actions are filed, an insurance company, or a corporate legal or self-insurance office. The common objective of all of the techniques examined is to improve the quality and lower the cost of resolution by better informing the decisions that control when, how, and for what, money is to be spent in connection with pending claims.

The idea that these decisions can be systematically improved through computer-based analyses is relatively new and still quite controversial in many of the institutions involved. All of them habitually collect and analyze, particularly in financial terms, a considerable volume of cross-claim data. But in most institutions the claim-handling process itself has traditionally concentrated very largely upon analysis of the specifics of each particular claim—i.e., what appears in the individual claim or case file—rather than on the light that might be
shed on the most efficient handling of that claim by cross-cutting examination of the substantive approaches taken in the course of dealing with whole bodies of similar claims.

 Particularly as among insurers, the traditional single-claim focus does not ordinarily reflect technical unfamiliarity with computers; insurance companies are among the largest and most sophisticated users of computers in the world. The hard problems are (a) how to apply the computer to the claim-handling process without ignoring or distorting the often subtle but critical factors that may distinguish one claim situation from another; and, having found ways to do this, (b) how to accomplish with reasonable economy the task of building a computerized data base on claim-handling, working from files and other materials that in most companies are only now beginning routinely to involve computerized processing.

 These problems remain far from trivial. The degree of computer utilization varies enormously from firm to firm, and the extent to which courts use computers for more sophisticated tasks remains minimal. There seems little question that a revolution is under way on all of these fronts, but it is occurring at vastly different speeds in different places. The most helpful analytic tools, therefore, are ones that can be fitted to the state of the art and the data base in each individual institution that is prompted to use such a tool.

 The four experimental instruments described herein meet this test. They run from quite simple techniques that do little more than make explicit the claim evaluation and reserving steps that are now taken in all institutions that handle damage claims or cases, to quite advanced ways to model—and thereby to shorten and make less expensive—the bargaining process between litigants. Taken together, these approaches provide a good sense of the most promising computer aids to claim-handling that seem to be evolving.

 But why is this evolution relevant to the public interest, and, therefore, to the Institute?

 It is relevant because the public has a huge stake in how efficiently claims are resolved, not merely in a particular company or firm, but in the civil justice system as a whole. Most of that system is not to be found in our courthouses or other public buildings. Most of it consists of private actors—parties, insurers, and lawyers—operating in a private sector setting. Major reductions in the overhead cost burden paid by the public cannot be achieved through cuts in public spending alone, because in this area of social policy the lion’s share of the spending is done in the private sector. If the computer is to help reduce these costs, it must do so primarily by demonstrating its genuine usefulness to the businesses and people who make their living resolving claims,
whether they act on behalf of the claimant or of the party against whom the claim is made.

Accordingly, the Institute takes it as an important mission to monitor and facilitate movement toward more efficient claim resolution. If we can help to raise private sector consciousness of emerging claim-handling techniques, most of which are and should be developed by private concerns, we may be able to accelerate the pace of modernization of the civil justice system, which is the process most likely to relieve the crushing overhead cost that is now the price of resolving so many types of claims. We believe that this report is an important contribution to that cause.

Gustave H. Shubert
Director, The Institute for Civil Justice
Summary

The resolution of civil liability claims is an expensive and uncertain process. Frequent parties to civil litigation face growing costs, but they might reduce the expense and uncertainty of litigation through new methods for using computers. Organizations that have experience in handling a large volume of civil litigation can use these methods to manage groups of cases and to organize single, complex cases.

The methods should be useful to law firms, businesses, and government agencies, but because of the large volume and expense of litigation facing most property/casualty insurance companies, they probably stand to gain the most from implementing these methods. Expedited and less expensive litigation would also benefit the courts and taxpayers as well as the litigants.

The defense of civil liability claims being a major expense for insurance companies, they are particularly concerned about rising litigation costs. An informal survey of the claims departments of 47 insurance companies conducted for this study found that legal expenses doubled in the last five years for half of the companies.

Some insurers are also troubled by uncertainty over the anticipated outcomes of civil litigation. Several companies have quizzed their adjusters and found wide differences in how the adjusters evaluate the same hypothetical claims. Follow-up studies of actual claim handling also revealed wide differences among offices within the same company, and, of course, between companies.

These variations are costly. Some claimants may receive excessively generous payments because adjusters place too high a value on their claims. On the other hand, if adjusters place too low a value on claims, plaintiffs will not settle and the company will find itself ensnared in unnecessary trials.
NEW METHODS

Four new methods for using computers—open claim analysis, closed claim analysis, decision analysis, and rule-based modeling—may reduce the direct costs of litigation and the indirect costs of uncertainty in evaluating civil claims. All four methods have been used to analyze and support decisions about litigation, but most have not been widely applied. This report describes the development, uses, and limitations of each method, so that insurance company claims departments and other frequent parties to litigation can consider whether those methods might be of help.

Each method is designed to assist lawyers or adjusters in handling claims by providing them with information about expenses, the outcomes of past similar claims, or means to organize and evaluate complex, high-stakes claims. Two of the methods, closed claim analysis and rule-based modeling, can be powerful aids in training lawyers and adjusters. All of the methods can also help with management of claims, giving managers information on demand about litigation expenses and how cases are being settled. Claims executives or supervising lawyers can use this information to review policies for handling claims and for controlling expenses. They can then use the methods to implement and monitor those policies.

OPEN CLAIM ANALYSIS

Open claim analysis examines the amount of money at stake in each active lawsuit or claim and also provides an inventory of the financial stakes of all cases. The analysis is based on adjusters’ or lawyers’ estimates of exposure (likely award), amount of time to handle the case, expenses, and so on. When each claim is opened, the responsible lawyer or adjuster answers a simple set of questions about likely outcomes, activity, and expenses for that case. This information is entered into a computer, so that the open claim analysis can calculate and report back the full economic stakes for the case. For insurance companies and other defendants, the stakes are calculated as the likely award to which the defendant is exposed plus all expected costs in handling the claim, minus recoupment that might be expected from indemnators, reinsurers, and the like. For plaintiffs, stakes are calculated as expected recovery minus all costs.

Open claim analysis provides managers with a complete inventory of the expected exposure and expenses for all current cases. Managers can identify the types of claims that involve the greatest costs, identify how expenses are related to use of discovery and other procedures, and
target types of cases that should be handled minimally to reduce expenses. Estimates of the economic consequences of a claim can help lawyers, adjusters, and managers select between cases that should be settled and those that should be fully contested.

CLOSED CLAIM ANALYSIS

Closed claim analysis extends open claim analysis by using information on the outcomes of past claims to help decide what to do with an open claim and to assess how well cases are being handled. It provides much more information for managers and a more useful tool for lawyers and adjusters. While a claim is still open, an adjuster or lawyer answers additional questions about the facts important to the case, such as issues of liability, the plaintiffs' damages, the source and credibility of evidence, relevant legal issues, characteristics of plaintiffs, defendants, lawyers, and the jurisdiction. The analysis identifies past similar cases and informs the lawyer or adjuster about the outcomes and expenses for those past cases. The analysis also estimates a reasonable settlement range for the case and the likely outcomes if it is tried. The lawyer or adjuster can use this information to make a better estimate of the value of the case and to see how that value is changed by changes in evidence, legal rules, or alternative handling of the case.

By using closed claim analysis, lawyers and parties might settle claims more rationally. Insurance adjusters who are fully informed about the outcomes of past similar claims would be much less likely to overvalue claims. Plaintiffs would be less likely to undervalue claims that are novel to them or that might be obscure. Adjusters and lawyers can use the analysis to justify their appraisal of claims in negotiations and settlement conferences. Closed claim analysis can also help avoid unnecessary trials that result if adjusters place an unreasonably low value on claims or if plaintiffs' lawyers value a claim too highly.

Closed claim analysis can also help managers. The method provides more accurate estimates of case values for setting reserves or allocating litigation resources. It shows how personnel are handling cases, e.g., how they treat claims for general damages or use collateral sources.

Both open and closed claim analysis require the recording of information about a sample of individual claims, but the process need not be wasteful of lawyers' or adjusters' time, since they enter data as part of their own use of the analysis.

The computer programs needed to manage and analyze claims data can be easily written using decision support systems software. Decision support systems are new ways of using computers to help
managers answer business questions. Managers can readily examine stored data and draw on a set of preprogrammed analysis models by using "friendly" command language. Decision support systems are being used by a variety of business and government agencies.

Insurers, other companies, and law firms have begun to use open and closed claim analysis. The most widely known open claim analysis is the Invalue program used by Boise Cascade Company. A few insurance companies have used limited closed claim analyses, but the Institute for Civil Justice studies of jury trials are the largest application of this method.

The choice between open and closed claim analysis depends upon the size and complexity of claims. Simple, small-stakes cases do not require the systematic information that is provided by closed claim analysis. Rather, a company or law firm can use open claim analysis to inventory those claims and to remind adjusters, lawyers, or paralegals to carry out claims policies (e.g., identify collateral sources and avoid reimbursing expenses for which collateral sources have already made payments).

Closed claim analyses are most useful for moderate and large claims where aggregate stakes are high. The analysis might be more thorough for cases that have greater value. But closed claim analysis cannot provide precise estimates of extraordinarily large claims—claims that are too infrequent and vary too widely for useful statistical analysis, but that account for a large proportion of all payments made by a company. Those cases can be analyzed by two other methods, decision analysis and rule-based modeling.

DECISION ANALYSIS

Decision analysis is widely used for guiding business or government policy decisions in uncertain environments. To use this method, an adjuster or lawyer works with an analyst, identifying all important issues and alternative outcomes. These alternatives are displayed as a decision tree. The adjuster estimates the dollar consequences for each alternative and the probability that each alternative will occur. The decision analysis then combines the information about all alternatives to calculate the total dollars that would be involved with each possible outcome for the claim.

Decision analysis is useful for identifying important issues in a complex claim and some of the relationships among those issues. But the dollar evaluation for a claim may have little meaning, since the estimates upon which it is based are suspect and there is no single correct
means for performing the calculation. Also, because the method is entirely quantitative, it may have little meaning to claims managers, adjusters, and lawyers who are used to verbal, reasoned discussion of claims. Perhaps the greatest value of decision analysis stems from its relatively wide use, which means that the method may often serve as an acceptable basis for negotiating settlement.

RULE-BASED MODELING

Rule-based modeling is a new method for using computers to analyze and record how experts decide technical decisions so that others can share their expertise. Interviewers intensively question expert adjusters or lawyers about what decisions they would make for a specific case and for variations of that case. The interviewers use "if-then" rules to describe simple, limited conclusions about one part of a case. These rules can then be strung together to provide explanations of more complicated decisions.

A company or law firm can use rule-based models in two ways: (1) to analyze individual complex claims, and (2) as an "expert system" that less experienced adjusters or lawyers can consult to see how expert adjusters and lawyers might analyze and prepare claims. Because rule-based models break claims down into individual issues and analyze those issues in terms of if-then rules, the entire analyses of claims are in a form that is meaningful to lawyers, adjusters, and managers. They can accept, criticize, or reject the model's analysis or improve it by changing rules within the model. Rule-based analysis of a claim can also be presented and explained to adversaries or judges to support a company's or firm's settlement position.

The only application of rule-based modeling to litigation decisions thus far has been through preliminary models developed by the Institute for Civil Justice. The method is relatively untried, then, but holds considerable promise.

USES OF THE METHODS

None of the four methods has been used widely, but all have had limited applications. Most of these limited uses by insurance companies have been successful in improving claims handling, producing more reasonable settlements, and reducing expenses.

Widespread applications of most of the methods would change case handling for any company or firm; for example, computers would be put into wider use and management information and control would be
increased. Most of the methods have considerable promise, but com-
panies or firms should probably gain experience through limited appli-
cations before launching full-scale uses.

None of the methods is a substitute for expert judgment and experi-
ence. Helpful and informative as a method may be in organizing and
evaluating a case, lawyers or adjusters should stand ready to override
that analysis as reason dictates.
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Many people have contributed to this report, some by discussing their uses of information technologies in administering litigation, others by comments on briefings and earlier drafts of the report.

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Many plaintiffs' lawyers also discussed these ideas and made comments on drafts of the report. Ward Wagner and Alvin Anderson were very helpful, particularly in emphasizing how the use of these new tools by insurers would aid plaintiffs by expediting and rationalizing claims handling.

Members of the Claims Executive Council of the Alliance of American Insurers, the American Insurance Association, and the National Association of Independent Insurers provided an interested audience and offered many useful observations when I first discussed these ideas with them.

Within The Rand Corporation, Warren Walker and David Kanouse not only reviewed earlier drafts of the report but also brought my attention to new methods and applications. My colleague Donald Waterman helped shape many ideas about rule-based modeling. Gustave Shubert and Stephen Carroll supported my interest in writing a report that described how our substantive work at the Institute might help those who must administer litigation. Finally, Alyce Raphael has been patient and extremely productive in helping to get this project completed.


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I. INTRODUCTION

The cost of trying or even settling civil law suits has become a serious problem for businesses, lawyers, and private citizens. More and more people find themselves unable to afford legal representation, particularly for modest or uncertain claims. As competition intensifies among lawyers, they must strive to render their practices more efficient. Businesses, however, seem to have been hit hardest by the growing costliness of preparing, trying, and settling civil liability claims. Cost has prompted many corporations to increase their capability for handling litigation in-house, to seek other methods for managing and reducing costs of legal claims, and to support the founding of the American Corporate Counsel Association, organized in part to reduce corporate legal expenses (Banks, 1983).

This report describes new methods of using computers to streamline the handling of civil claims, thereby increasing lawyers' efficiency, reducing expenses, and potentially broadening the availability of legal representation. Law firms and any other frequent parties to litigation can use the new methods, but for illustration this report focuses on applications by insurance company claims departments, which may be able to use them to the greatest advantage. Being so frequently involved in civil claims, insurance companies' use of the methods may also prove advantageous to others by expediting the resolution of claims, which would benefit taxpayers and all parties to litigation.

Because payment for the defense of liability claims is among the services that insurers offer, they have a greater need to control legal expenses. As one claims executive writes, the rapid growth in legal expenses has been "cause for alarm" to many insurance companies (Mecherie, 1981). He reports that his company's legal expenses increased 80 percent over a recent five-year period, more rapidly than inflation and increased business combined.

To gain insights into this problem, the author recently mailed an informal questionnaire to senior claims executives of companies in the three insurance trade associations: the Alliance of American Insurers, the American Insurance Association, and the National Association of Independent Insurers. Two of the questions asked about increases in legal expenses over the previous year and previous five years. The responses show that the experiences of this one claims executive are not unique. Of the 24 companies that provided five-year information,
11 reported that their expenses had more than doubled.\(^1\) Only 5 reported increases of less than 50 percent. At the other extreme, 3 reported a *four-fold* increase. For half of the 40 companies that provided information on the preceding year, legal expenses went up over 16 percent; for one-fourth, the single-year increase was over 25 percent.

Such results show why soaring legal expenses are particularly alarming to insurance companies. Legal expenses now represent a major portion of their costs of processing claims—more than one-third for most companies and more than one-half for many (i.e., the costs of handling claims but not including amounts paid to claimants).

Both insurers and other companies have begun to rethink how they handle legal claims and use outside legal services. Some companies are expanding their use of in-house counsel and their use of arbitration programs. Many are trying to work with their outside lawyers to reduce legal expenses, demanding more thorough accounting and greater control over expenses and decisions about required work. Companies are also working with defense lawyers to streamline legal procedures (Mecherle, 1981). Still, many insurance company claims executives remain pessimistic about these efforts. They see little enthusiasm for economy among the organized bar. Indeed, many feel that bar reforms increase rather than decrease legal expenses.

Despite this pessimism, as investment income decreases and competition for underwriting dollars intensifies in the coming years, insurers will almost certainly feel compelled to reduce the costs of processing claims while controlling the amount paid out for claims. Companies that can do that most efficiently will have a distinct competitive advantage.

New uses of computers as information and decision tools might help insurance companies achieve savings in their claims operations. Researchers, businesses, and government agencies have developed new ways of using the latest generation of more flexible and powerful computers to aid managers and to guide important decisions. These new applications are so versatile, so easy to use, and (relatively) inexpensive that *Business Week* has described their development as “the second computer age.”\(^2\) Some of these new ways of using computers—decision support systems, artificial intelligence, decision analysis—might become useful tools for law firms and businesses such as insurance companies that are frequently involved in litigation.

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\(^1\) The survey was mailed in July 1982. Companies reported on their last complete year of business. A total of 47 companies responded, but 23 could not readily provide information about legal expenses five years back, perhaps because legal expenses were not a pressing concern at that time.

The new tools seem to have potential for insurance company claims administration. Some promise ways of monitoring costs and claims payouts so that managers can identify operational areas where expenses can be safely cut and cases where payments might be reduced. Among other benefits, this monitoring should facilitate the tighter accounting that companies are demanding from outside lawyers.

Other new tools can help companies resolve another costly problem: the wide differences in the values that adjusters place on similar claims. Companies that have examined this problem by asking adjusters to evaluate the same hypothetical claims have been shocked by the disparate values they came up with.

The author had the same experience when he asked 16 members of the Los Angeles Claims Managers Association to evaluate a hypothetical claim. No more than two agreed on any value. Although nine valued the claim between $50,000 and $150,000, others ranged from $6,000 to $750,000! Similar variations prevailed among the claims staff in the same office of one company. Ironically, divergence was greatest among the most experienced claims adjusters in the office.3

Divergent evaluations are costly, high or low. Insurers are paying out much more money than is needed to settle claims that are valued too high. But they may be caught up in expensive, unnecessary trials when adjusters place unrealistically low values on claims. New information and decision tools can help reduce excessive settlements and unnecessary trials by giving adjusters hard information about the eventual outcome of similar past claims or by organizing analyses of complex, high-stakes claims.4

The new tools may help insurance companies improve claims administration by providing managers with detailed information about current claims practices and then giving management more effective means to direct future practices. The methods can also be used in training new personnel and in upgrading the skills of present staff.

Several insurance companies have already begun to try out some of these methods, working with outside consultants or developing new claims technologies through in-house research departments. Several projects within the Institute for Civil Justice are developing information systems that might be applied to the administration of litigation, including insurance company claims and administration. One involves statistical studies of jury verdicts (Peterson and Priest, 1982; Shanley

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3This finding appears to reflect reality. After seeing the divergent evaluations of hypothetical claims, one company examined its closed claims and found no greater uniformity for actual settlements.

4Similarly, plaintiffs' lawyers can use these methods to avoid undervalued or excessive claims. By promoting reasonable evaluations by both parties, widespread use of the methods could facilitate timely settlements, reducing litigation costs and delays.
and Peterson, 1983; Peterson, forthcoming; Chin and Peterson, forthcoming); another consists of research on artificial intelligence, the aim being to model how lawyers and adjusters evaluate and negotiate claims (Waterman and Peterson, 1981).

Many lawyers and executives are interested in these new methods for the administration of litigation, but want more information on what they can do and what their drawbacks are. This report describes four new methods: open claim analysis, closed claim analysis, rule-based modeling, and decision analysis. The report describes how each method would be used in administering lawsuits and civil claims. All of the methods are being used in business, all can be used to improve the administration of litigation. Because of the volume of their claims administration, the methods seem particularly appropriate for insurance companies.

These tools also have their limitations. All involve costs, although the costliness varies and some costs might even be spread across groups of law firms or companies. If used widely, some methods might markedly change how lawyers, adjusters, and other personnel handle claims—changes that could be productive or disruptive.

As a result, these tools are probably not for everybody. For example, some well-managed claims departments might regard computers as an unnecessary and costly burden. It is certainly true that no computerized information system can replace good, experienced claims personnel—although such a system should be a help.

The tools seem particularly worthy of consideration by companies or law firms that now use or plan to use computers for routine matters in administering litigation and who want to get more value from those systems. The methods might greatly increase the utility of their computer systems, providing aids both to managers' decisions and also to lawyers and adjusters in handling cases, all with limited additional burden on staff.

Finally, it is important to emphasize that all of these methods can be undertaken a step at a time. Both the potential benefits and potential costs will be greater when a law firm or company uses a method widely in administering litigation. But a firm or company can try out some of these methods on single cases and others in limited, experimental applications. Indeed, most current applications of these methods by insurance claims departments are limited and exploratory. This lets a company evaluate the utility of the methods and also gives it the experience to design more effective, large-scale applications if it chooses to proceed.
II. OPEN AND CLOSED CLAIM ANALYSIS

To control expenses, one must know where they are occurring. But few insurance claims executives or others who manage litigation staffs have systematic information about the sources of legal and litigation expenses.

For example, only four of 47 insurance companies that responded to our questionnaire about legal expenses could provide information about how much of their legal and claims expenses were devoted to large exposure cases instead of small ones. (Exposure is the amount of money that a losing insurer or defendant might have to pay, having been “exposed” to the risk.) Data from our study of jury verdicts in Cook County, Illinois, illustrate why this information is critical. Most claims against insurance companies, like most jury verdicts, are modest (Fig. 1). We found that half of all jury awards in Cook County were under $8,000 and that 80 percent were under $30,000 (Peterson and Priest, 1982).1 An even greater proportion of insurance claims involve small amounts, but most of the money paid by insurers to claimants goes to claimants in a small number of cases that have great exposure. Again using Cook County data to illustrate, the 20 percent of plaintiff’s verdicts that exceeded $30,000 accounted for 80 percent of all the money awarded; the largest 1.7 percent of the verdicts accounted for 40 percent of all money awarded.

Insurance companies and other frequent litigants are of course aware that it costs some money to process their small claims, but they may not be able to say with certainty whether they allocate an appropriate proportion of the money that they spend on claims and legal expenses to the largest cases—those that represent most of their exposure. Open claim analysis provides the data needed to make decisions about such allocations. As discussed in further detail below, other technologies can then be used to reduce expenses for small cases and to maximize the effectiveness of dollars invested in defending large exposure cases.

1The awards were for all trial courts in Cook County between 1960 and 1979, adjusted for inflation, and expressed in 1979 dollars.
Fig. 1—Distribution of claims and money paid out
(based on jury awards in Cook County, Illinois, 1960–1979)
DECISION SUPPORT SYSTEMS

Both open claim and closed claim analysis can be implemented in a “decision support system” environment, which businesses are now using to answer management and policy-related questions, such as how expenses are distributed across operations (Keen, 1980). These systems are designed to support the managerial decisionmaking process in large organizations. Computer terminals enable executives or their staff to examine stored data and to ask questions of the data base through a simple, conversational command language. The same language also lets executives call upon a variety of analysis programs that will answer more complex questions (e.g., what the effect will be of a particular management decision).

As applied to insurance claims administration, open or closed claim analyses could answer claims executives’ questions about expenses, exposure, and settlement practices, such as: How are expenses related to the size of exposure of cases? Or, how do expenses and settlement practices vary among offices? Because the command language can draw on a variety of analysis programs, decision support systems are flexible—they can provide information for a wide variety of questions raised by different managers. And they are fast—by using a computer terminal an executive can ask one or several questions and get rapid answers while he is considering a business decision.

These new ways of using computers are unlike computer applications currently used by insurance claims departments. Many companies are using computers to search large quantities of data (e.g., to check underwriting records for coverage), for accounting purposes (e.g., to issue checks, to keep track of payments), or to generate routine reports (e.g., on claim volume, size of payments, and so on, by region or by office). Such clerical and accounting functions generate little excitement among claims executives; it would be a different matter if they could use computers to identify ways of improving claims practices or to answer such management questions as: Can adjusters in the Atlanta region make better use of collateral sources? Is the Kansas City office paying too much in general damages for nondisabling injuries? As it is, managers do not usually receive timely reports about claims activity; typically, they receive last month’s or last quarter’s data.

Most claims executives are also well aware of the substantial costs of present computer applications. Applications that require collection of large quantities of information use up valuable staff time, as adjusters or other claims personnel, perhaps bored, fill out forms in which they may see little value.
The new approaches try to brighten that picture. Both artificial intelligence and decision support systems are designed to provide flexible, easy-to-use tools to help experts make business or technical decisions. Claims executives or adjusters can get immediate answers to their questions (e.g., How do the Atlanta, Baltimore, and Houston regions compare in their use of collateral sources? Answer: Atlanta is better than Baltimore but not as good as Houston).

Open claim and closed claim analyses are also tools for adjusters to help them handle cases efficiently and successfully. Adjusters can use the systems in analyzing and preparing individual claims. After entering limited information about a case into the computer system, they get back analyses of the expenses and exposure for the case. In turn, the information that adjusters enter updates and expands the databases. Data collection is no longer an expensive diversion from adjusters' normal claims processing. Rather, it becomes an aid to and an integral part of adjusters' preparation and evaluation of cases.

OPEN CLAIM ANALYSIS

Open claim analysis uses simple computer programs to (1) analyze computerized inventories of cost and expense estimates for all active cases, and (2) compare expenses with exposure for individual cases (or expected outcome for plaintiffs). By using an open claim analysis, a company can monitor its claims expenses, its exposure, and other important case information. And claims adjusters can get a complete picture of the expected costs and exposure for each of their cases. Similarly, law firms can use open claims analysis to monitor expenses and income and to give each lawyer a full analysis of costs and expected outcomes for each of his or her cases.

In this analysis, shortly after a case comes in, the adjuster or lawyer handling the case fills out a simple form that tracks through an analysis of costs and likely case outcomes. This information about the case can either be entered directly by the adjuster or lawyer into the company's computer system through a terminal or can be entered by other personnel from written forms. The computer calculates the total economic stakes for the claim—the estimated outcome plus all predicted litigation expenses for defendants; the estimated outcome minus expenses for the plaintiff—and reports this back to the adjuster or lawyer to help in negotiating the claim. Data from all claims are summarized, categorized, and analyzed according to management needs.

Boise Cascade Company has developed the most widely known version of open claim analysis, a computer program known as "Invalue"
(Gonser, Soma, and Wilhelm, 1981). To carry out the Invalue analysis, Boise Cascade staff lawyers complete a written form to estimate all likely expenses and the likely outcome of each claim. The form asks the lawyers to estimate the probability that the company will be found liable and the likely size of any award. The lawyers also estimate the likelihood of successfully asserting a counterclaim, a cross claim, or claim for indemnification, and the likely size of such claims. They go on to estimate the likely amount of outside legal expenses, the amount of time that inside staff will spend in processing the claim, the amount of travel expenses, and so on. The Invalue program also asks a series of questions that are used to provide dollar values for certain intangible costs, such as the precedential value of the case, costs of bad publicity resulting from an unfavorable jury verdict, and so on.

After the lawyer enters this information, Invalue reports its calculations of the economic stakes of the case: exposure (probability of liability times likely size of award) and the total of all expected costs.

Invalue probably would not be directly transferable elsewhere; it would require tailoring the kind of information used in an open claim analysis to the needs of the particular law firm or company. Insurers might want to include further information to ensure that adjusters consider all significant elements of cost or exposure and to provide managers with needed information about cases. For example, claims managers might get useful additional information by asking their adjusters to evaluate the complexity of each case, or to estimate expenses for indemnification actions separately from expenses for the primary claim, or to identify cases that raise particular issues, such as cases where an adjuster doubts liability for injuries or questions claims about the cost of medical treatment.

Estimating Settlement Value

Open claim analysis has been developed to help lawyers prepare and negotiate claims. As applied to insurance claims departments, the analysis would ask lawyers, adjusters, or claims managers to estimate all elements of cost and exposure for a case. Figure 2 shows some of the types of information that an adjuster might provide for a new claim. Figure 3 shows the resulting output provided to the adjuster.

If an adjuster's time is valued at $20 an hour and a supervisor's at $50, the illustrative case has a total value of $54,100, which is reported to the adjuster so that he can make more informed decisions in handling the claim. If he chooses to defend this claim all the way to trial, he must consider how much he thinks he will have to pay. This amount (the expected outcome) is $40,000—calculated by multiplying
Q: What are the chances that a court or jury would find the insured to be liable for the claimant’s-loss or injury? (indicate as a probability)
A: 80%

Q: What is your estimate of the size of an award to the claimant if the insured is found liable?
A: $50,000

Q: Can we assert a counterclaim, cross-claim, or indemnification claim against anyone?
A: NO

Q: What total amount of outside legal fees would you expect for this claim?
A: $12,000

Q: What are the expected court costs and lawyers’ reimbursable expenses?
A: $500

Q: What are the expected expenses for investigation/experts?
A: $500

Q: How many hours do you expect would be spent by company adjusters?
A: 30 hours

Q: How many hours do you expect would be spent by claims supervisors or managers?
A: 10 hours

Q: What are the expected travel expenses for inside staff?
A: NONE

Q: Is this case newsworthy? Might it produce favorable or unfavorable publicity concerning the company?
A: NO

Q: Might a trial or settlement produce a nonroutine precedent?
A: YES

Fig. 2—Example of input data for open claim analysis
Example of Output for an Open Claim Analysis:

Calculation for Case:

Exposure = 0.8 \times $50,000 \quad \Rightarrow \quad $40,000

Costs

- Legal fees and costs = $12,000 + 500 \quad \Rightarrow \quad $12,500
- Investigation/experts \quad \Rightarrow \quad 500
- Adjuster's time = 30 \text{ hr} \times $20 \quad \Rightarrow \quad 600
- Supervisor's time = 10 \text{ hr} \times $50 \quad \Rightarrow \quad 500

Total costs \quad \Rightarrow \quad 14,100

Total value of case \quad \Rightarrow \quad $54,100

Comment: This claim should not be settled for more than $54,100. Payment between $40,000 and $54,100 exceeds the estimated exposure.

Do you want to modify any estimates to examine alternative evaluations?

Fig. 3—Calculation of value of illustrative claim

the probability of liability times the expected award: 0.8 \times $50,000.

To this he must also add all costs of trying the case: the cost of outside counsel, cost of inside staff, and other listed expenses. The total value of the case, i.e., the expected expenses plus the expected outcome, is $54,100. The adjuster should reject demands that exceed this amount. The company would likely save money by settling the case for less than $54,100, even if the settlement exceeded the expected exposure of $40,000. Such a settlement would at least save costs.\(^2\) Of course, the adjuster should still try to settle below this value; the calculated total value merely reflects the maximum amount for which it is economically advantageous to settle the case.

An operating open claim analysis would take other factors into consideration so that the calculation would not be as simple as the example. Also, like all claims, the illustrative case involved an intangible factor that may be difficult to evaluate—a potential precedential effect. This factor was not included in the illustrated calculation. Depending

\(^2\)Some claims managers have said they would not want to settle this case for more than $40,000, following a policy of not paying "nuisance value"; they do not want claimants to "hold them up" for more than a case is worth. Open claim analysis provides a means to enforce that policy and lets managers examine its effects (e.g., are adjusters able to force settlements at the adjuster's valuation of case exposure without paying nuisance value? Or, alternatively, does the company try more cases and possibly lose more in expenses than it gains by reducing payments to claimants?).
upon the company’s approach, the open claim analysis might attempt to place a dollar value on this precedential effect (as the Invalue routine does), or if the case involves unusual precedential matters, it could be automatically referred to a claims supervisor to consider this effect.

This description shows how open claim analysis can be used shortly after a claim has been made to estimate exposure and costs for a case. But the analysis can be repeated as a case progresses, when exposure and expected expenses might have changed or when an adjuster has more complete information.

Monitoring Expenses

Open claim analysis can help save expenses by encouraging adjusters to identify cases that can be settled early. It can also identify cases that should be fought, i.e., where claimants’ demands are high and where the expected legal and claims expenses are small relative to the exposure.

Further, because it obtains information about the likely expenses and exposure for all current claims, open claim analysis can provide claims managers with accountings and analyses that they can use to shape efficient claims administration.

Managers can use the routines to allocate resources. By reviewing the relationship between exposure and expenses, they can direct adjusters in settling appropriate cases, concentrating claims-administration dollars on cases where exposure is great relative to the expenses for the case.

Managers can identify cases that are producing the greatest expenses so that they can try to reduce those expenses (Gonser, Soma, and Wilhelm, 1981). Also, because the open claim analysis has computerized information for each claim, managers can examine the costs and exposures for cases raising particular legal or factual issues, for simple versus complex cases, and for any other selection based on computerized information. If the input form was designed to obtain data on expected expenses for discovery, investigation, experts’ fees, travel expenses, or other activities, managers can routinely review the total and average expected costs for these activities. They can identify the types of cases in which these expenses occur, and examine the relationship between expenses and likely outcomes.
Development of Value Analysis Routines

It is fairly simple and inexpensive to develop and use open claim analysis. The current claims practices of many insurance companies facilitate collection of data needed for open claim analysis. Most companies already require adjusters to record basic information on forms, such as the type of claim and potential (i.e., reservable) exposure. The input for open claim analysis could be obtained simply by revising these existing forms.

The most critical steps are to design the data forms, plan the subsequent analyses, and write the computer programs. Boise Cascade's program is an instructive example, but a company or law firm would need to design its own data collection forms and write its own programs to deal with issues that are important to processing its own cases. For example, an insurance claims application might collect and analyze data about insurance limits, information about the estimated costs and payoffs from each potential indemnification claim, and so on.

Computerization of the data would be the most expensive step. The computer program itself is straightforward. Boise Cascade's Invalue program was developed by one of the company's staff attorneys on his home computer. Applying the routines to the large volume of claims processed by insurance companies would require more data entry and somewhat more complex techniques of data management, but these would still be simple applications of existing decision support systems. In short, with proper planning and oversight, computerization would be a relatively modest task. Careful initial planning could hold down expenses by assuring the efficiency of data collection, management, and analysis.

Within corporations, development of a useful open claim analysis requires interaction among departments. The routine should be designed to meet the needs of claims management or the corporation's legal staff, but it must not burden the computer and research departments too heavily. The project should be designed cooperatively by personnel from all of those departments—ideally, by people with experience in all areas.

CLOSED CLAIM ANALYSIS

Open claim analyses are based on adjusters' or lawyers' early evaluations of the exposure and estimated costs for each current claim. This initial information about each case can be updated as facts are investigated, issues clarified, and expenses incurred, and the handling of the case can be modified as it progresses.
Finally, the picture of a case is complete when it closes. Although lawyers and managers have little or no continuing interest in a case after it has closed, analysis of closed cases can provide invaluable help in managing and handling current claims.

Closed claim analysis adds two types of information to open claim analysis. First, actual outcomes and expenses for a large number of past claims are analyzed to provide projections of costs and outcomes that are more accurate than adjusters' often speculative projections. Second, closed claim analysis collects specific information about more factors that are likely to be important in determining the outcome of claims. As a result, claims managers get precise information about recent claims and claims handling and much more accurate projections of future exposure and expenses.

Management can determine how specific features of claims influence the settlements; e.g., how much money is saved by having the claimant examined by a defense doctor? Do such savings exceed examination expenses? Does this depend upon the type of claimed injury? The analyses can be used to identify how the type and severity of injuries affect settlement values, and how outcomes are affected by liability issues or by types of plaintiffs or defendants, the availability of potential co-defendants, jurisdictional location, quality of opposing lawyers, specific substantive rules of law, or any other pertinent factors for which data can be collected.

Closed claim analyses also provide precise information about sources of expenses. Since the analyses are based on past results, not on lawyers' or adjusters' projection of costs, managers can more confidently identify appropriate targets for reducing expenses.

Closed claim analyses can provide more—and more accurate—information about an insurance company's claims and settlement practices, making it possible to answer such questions as: How do adjusters apply the collateral source rule? How do branch offices differ in their payment for pain and suffering?

Claims management can review closed claim data to evaluate adjusters' settlement practices. Findings that show sound practices can be used as guidelines for other adjusters and as training material for new adjusters. Unsound practices—that unnecessarily run up costs or that result in less than favorable settlements—can be targeted for change. Managers can use closed claim analysis to effect changes in adjusting practices and to monitor future practices to see if desired changes have occurred.

Closed claim analysis is also an important tool to help adjusters and lawyers handle claims and save time in the bargain. They draw upon a decision support system that analyzes closed claims to help identify
and organize key issues in their current cases and more accurately project likely outcomes and expenses.

Closed claim analysis can also be a persuasive negotiating tool. An adjuster or lawyer can draw upon the "memory" of closed claim analysis to identify similar past cases. In justifying settlement values to the opposing party, settlement judges, and others, the adjuster or lawyer can cite both previous cases and the projection of likely outcomes.

Collecting Closed Claim Data

Like open claim analysis, data for closed claim analysis is obtained from adjusters or lawyers, who answer a series of questions about a current case. The questions help adjusters and lawyers to prepare and organize the claim and provide some assurance that all critical issues will be considered. The questions may be especially useful in guiding inexperienced lawyers or adjusters.

Most data are collected while the case is still open and could be collected as part of an open claim analysis. This reduces the cost and inconvenience of data collection. Prior to closing, the lawyer or adjuster is familiar with the case and has the file available. He can provide information more quickly and accurately than can someone reviewing the file after it has closed. Whether data are collected for an open or closed claim analysis, the time and effort spent by adjusters and lawyers in entering data is not wasted. They enter information in order to obtain output that would help in preparing and negotiating a claim. Then when the claim closes, the adjuster or lawyer closes the file by entering final information about the expenses and disposition.

Figure 4 shows some of the types of questions that insurance claims adjusters might answer about each claim. The questions are meant to be no more than illustrative, but they include factors that our research has found important in verdicts and evaluations of settlements, as well as other factors that would be helpful in analyzing jury verdicts. Adjusters would provide information about liability issues: actions by the insured, the claimant, and other parties; the claimant's injuries and disabilities; the amount and types of economic losses (i.e., specials); claims for future expenses; characteristics of the claimants, insured, and other defendants; strength of expert and lay witnesses; evaluations of lawyers; and so on.

Adjusters would answer a few questions in each of these areas, describing matters with which they should be familiar. The key is to ask only about items that are likely to be important—in most cases, probably fewer than 50 questions.3

3To allow analyses across cases, questions and answers must be general, rather than detailed and specific. Useful analyses cannot be conducted on information as detailed as:
CLAIM/SUIT

Company file number: 123-56
Has a lawsuit been filed: Yes
Court: Los Angeles Superior, Central District
Judge: Judge Justice
Docket number: LA 98763

DEFENDANTS

Claims against how many of our insured: 1
Claims against how many others: 0
Number of other potential defendants: 0

COMPLETE THE FOLLOWING FOR EACH DEFENDANT OR POTENTIAL DEFENDANT

INSURED = 1
Type of defendant: Individual
Claim arise from business activity: Yes
Type of business: Retail hardware store
Size of business: Small

LIABILITY ISSUES:

Type of claim: Slip and fall
Claimed basis: Negligence—failure to maintain
Strength of claim: Clear Strong Strong Close Weak None

Liability facts disputed: No
Basis for punitive?: No

CLAIMANTS

How many claimants: 1

COMPLETE THE FOLLOWING FOR EACH CLAIMANT

CLAIMANT = 1

Description: Individual
Age: 38
Employment: Fully employed sheet metal worker
Income: $38,000 yr.
Dependents: 3, wife and two minor children
How sympathetic?: +3 (Rate from +5, very sympathetic, to −5, very unsympathetic)

Comparative/contributory:
Basis for contrib/compar?: Yes
Claimed basis: Inattentive
Strength of claim: Clear Strong Strong Close Weak None

Fig. 4—Example of input data for closed claim analyses
The data are analyzed for a large number of cases. Different statistical analyses can be performed to serve different objectives, including those that identify factors and issues important in determining the amount of settlements and expenses. Our analyses of jury verdicts at the Institute for Civil Justice illustrate the types of analyses that can be carried out (see, e.g., Peterson, forthcoming; Chin and Peterson, forthcoming).

Helping Analysis of New Claims

As a lawyer or adjuster answers questions for an active claim, those data are compared with past, closed claims. The computer describes

"compound, comminuted fracture of the radius and ulna." Such information can be used in analyses if it is described more generally as: "fractured forearm"; "very serious"; "permanent disability" (see, e.g., Peterson, forthcoming). Thus, in providing the information, adjusters will have to make evaluations and generalizations about the case. That is why it is so important to get the information directly from the adjusters who are most familiar with the case.
the dispositions of similar past claims and uses them to project a range of likely settlements for the present case. With sufficient cases, the analysis could also project what might happen if the case were tried—showing the probability of a plaintiff's verdict, the expected award, and the chance of an extraordinarily large verdict.

Figure 5 shows what output for hypothetical results might look like for the claim illustrated in Fig. 4. The output could include summaries of past similar claims (as shown in Fig. 5), as well as details of the facts and/or outcomes of these similar claims (included as an unselected option in the output of Fig. 5). The output also shows the results of statistical projections of jury decisions and settlements for the claim, both based on the outcomes of past claims.

Lawyers and adjusters can also use the analyses to see how the settlement value of the case might change with changes in facts or under alternative legal rulings. In Fig. 5, the adjuster has made requests to see how the expected outcomes might change if he assumes that the claimant has a permanent disability. After the adjuster specifies the changes in response to further probing by the computer, the closed claim analysis would be rerun, using the new facts.

The closed claim analysis could also analyze expected costs of taking a case through various stages of litigation, again based upon experience with past claims.

The computer analysis can suggest elements of a case that are most likely to affect its value or additional information that may aid in preparing and negotiating the case, e.g., suggesting to an adjuster additional facts, possible counterclaims, or even arguments that might reduce the settlement value of a case, or facts that would help a plaintiff's lawyer increase the value of a claim. In Fig. 5, the adjuster decided to explore how disability affected the expected case value, but the analysis could have examined this alternative automatically, bringing it to the adjusters' attention if disability were important.

In addition to helping adjusters settle claims, closed claim analysis might improve an insurance company's estimates of reserves set aside for claims. Since reserves are usually estimated by adjusters, they are highly variable—frequently larger or smaller than needed. Most companies now modify those estimates in the light of their past experience with reserves and the actual amounts paid. In fact, these modifications are a form of statistical analysis conducted across all cases. Closed claim analysis could be used to estimate accurate reserves for each claim, based upon the company's experience with similar claims.

Lawyers and adjusters should use closed claim analysis only as a guide, to be modified or even discarded as reason dictates. For example, estimates should be modified for cases with unusual factors that
Claimant 1

Comparable cases:
- 22 cases in last 2 years with similar injuries and similar liability claim
  - 14 settled with payment, range: $3,000 to $48,000
  - 10 of 14 with payment between $10,000 and $22,000
  - 7 closed without payment
  - 1 jury trial (Cook County, Law Division): defense verdict
  - All cases without payment involved weaker insured liability and stronger contrib. issue

Do you wish file numbers or further data on comparable claims?
Answer: NO

Estimates for this claim:

Exposure:
- 90% chance of liability if tried
- 5% chance that award would exceed $100,000
- 70% certainty jury award between $22,000 and $38,000
- Expected verdict: $27,000 (≈ 0.9 x $30,000)

Further expenses:
- For trial: $10,000
- For settlement: $1,300

Settlement value (based on past settlements of similar cases):
- $15,000 to $21,000

Do you want to examine alternative case data without changing data now stored for case?
Answer: YES

What type of data?
- Claim/suit
- Defendants
- Liability
- Claimant 1
  - Description
  - Comp/contrb
  - Injuries
  - Disabilities YES
  - Specials
  - Futures YES

Fig. 5—Analysis for Claim = 123-56
are not routinely included in analyses (e.g., a claimant is ripe for settling because he is in the process of divorce, or the case involves a hand injury to a concert pianist).

The method cannot replace critical judgments and skills—such as raising and analyzing legal arguments, weighing the significance of case facts, assessing the credibility of witnesses and experts, or preparing a case and witnesses for trial. No machine can perform such tasks.

Since adjusters would be working with information about past claims, some claims executives have expressed concern that closed claim analysis will perpetuate past bad practices. Claims managers can avoid that problem by editing the information given to adjusters, for example, reporting settlements only for claims that are properly handled. In fact, lawyers and managers can use closed claim analysis to identify claims practices that they want changed and to remind personnel about proper practices (e.g., an insurance company may want fewer payments of expenses already paid by collateral sources; a plaintiff’s law firm may want to remind lawyers to consider adding claims for lost consortium).

Development of Closed Claim Analysis Systems

Closed claim analysis can be implemented either as an addition to an open claim analysis system or as a separate project. In either case, the project would involve three phases: design and planning, initial data collection, and actual use (adjusters or lawyers enter data and obtain evaluations).

All this must be done carefully. A company or law firm should attempt to foresee its uses for the analysis and ensure that it is collecting the appropriate data. For example, if claims managers want to ensure that adjusters are taking full advantage of collateral sources, adjusters must be asked about all potential sources of compensation to claimants. If claims managers want to look critically at special damages, adjusters should distinguish costs for medical treatment versus diagnosis, indicate if a claimant uses an expert who routinely prepares reports for claimants, and so on.

The company or law firm must balance its need for any particular analysis against the costs of collecting, managing, and analyzing large data bases. Closed claim analysis can provide many products for the administration of litigation, but it also can be costly in terms of both money and the time of adjusters or lawyers.

The company or firm must ensure that it obtains as much information as possible within a reasonable data collection effort. Our experience at the Institute for Civil Justice in analyzing civil jury trials
shows that powerful analyses can be based upon a limited number of carefully selected variables—if data can be obtained directly from adjusters or lawyers familiar with each claim.

The planning of a closed claim analysis should involve both personnel who are familiar with the information needs of people who handle claims as well as experts on data collection, such as representatives of the company’s computing and research staffs.

The planning staff for a closed claim analysis system must also decide which claims will be included. The company might want to provide analysis capability for only certain types of claims (e.g., product liability) or for claims with an apparent exposure above a certain minimum. To reduce project costs, data could be collected for a sample of claims—for example, for only 10 percent of all claims that involve possible exposure over $20,000.

Even initial closed claim analysis must be based upon a substantial sample of claims. To speed development of the sample, a company or firm might collect data for recently closed claims as well as for their current claims.

A company or firm can start with a limited closed claim analysis system, building to a more complete system. Some insurance companies have begun to do this, obtaining a few pieces of information about claims from selected offices. For example, by collecting information about gross and net payments for various types of medical expenses and lost-time claims, one company has been able to explore how well each office is using collateral sources. Similarly, simply by requiring adjusters to allocate their payments for reimbursement of past and future expenses and for a few types of general damages (e.g., disfigurement, restricted activities, pain and suffering), claims executives learned how often each office made payments for these general damages and in what type of cases payments were made (at least by size of medicals). By comparing branch offices, claims management saw what is feasible (i.e., the best practices in any office), and how well each office was doing.

**CHOOSING OPEN OR CLOSED CLAIM ANALYSIS**

To summarize the use of open and of closed claim analysis, it is useful to recall the distribution in the size of claim exposures. As Fig. 1 showed, most claims involve modest amounts of money and a small number of cases with great exposure account for most of the money at stake. Problems in the administration of litigation differ depending upon the stakes and complexity of claims, as illustrated in Table 1.
Table 1

NEEÖS DIFFER BY CASE SIZE

<table>
<thead>
<tr>
<th>Case Size</th>
<th>Inventory</th>
<th>Routine Handling</th>
<th>Systematic Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Moderate</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Large</td>
<td>x</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Extraordinary</td>
<td>x</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Many claims involve such small amounts of money that insurance companies (and law firms that take such cases) process them quickly and inexpensively. Moderate cases (arbitrarily defined in Fig. 1 as those involving between $3,000 and $30,000) should also be handled routinely, but keeping in mind that in aggregate they involve significant amounts of money. Adjusters and lawyers would benefit by having precise and systematic information about how similar cases have been handled in the past. But because of the volume of these moderate cases, such information should be provided routinely, without excessive detail. Each large and extraordinary case, of course, calls for thorough analysis.

Because claims involving varying exposures present distinctive concerns for the administration of litigation, different analytic tools can be used for claims of different sizes (Table 2). But the simple case evaluation provided by open claim analysis is an important part of processing all the cases. It provides an inventory so that management can know the distribution of cases in terms of the amount of exposure.

Table 2

USE OF OPEN CLAIM ANALYSIS AND CLOSED CLAIM ANALYSIS FOR CASES OF DIFFERENT SIZES

<table>
<thead>
<tr>
<th>Case Size</th>
<th>Inventory</th>
<th>Routine Handling</th>
<th>Systematic Analysis</th>
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</thead>
<tbody>
<tr>
<td>Small</td>
<td>Open</td>
<td>Open</td>
<td>Closed</td>
</tr>
<tr>
<td>Moderate</td>
<td>Open</td>
<td>Closed</td>
<td>Closed</td>
</tr>
<tr>
<td>Large</td>
<td>Open</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extraordinary</td>
<td>Open/Closed</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Neither open nor closed claim analysis is adequate for extraordinary claims. Rule-based modeling or decision analysis can be used.*
likely expenses, and the general issues involved in those cases. And by analyzing the complete economic significance of each case, open claim analysis provides the basis for deciding what type of further processing should be provided for each case.

Open claim analysis is sufficient for small cases. They involve little money and there is little need to inform adjusters how such cases have been handled in the past. Those cases should be handled and disposed of routinely. Still, because in aggregate small claims amount to large sums, a company might want to obtain limited data to assure that adjusters are handling them properly. For example, the open claim analysis could ask adjusters to list gross and net specials to ensure that they are using collateral sources, and adjusters might allocate payments among several categories of generals and specials to see that payments for general damages are appropriate.

While closed claim analysis can provide helpful information about the potential exposure for almost all cases, it cannot provide precise information about the value of extraordinary cases. It may warn that pending cases could involve extraordinary exposure, but such cases are too infrequent and volatile for accurate estimation of value by closed claim analysis. Section III describes two alternative methods for that purpose: decision analysis and rule-based modeling.
III. ANALYZING COMPLEX, HIGH-STAKE CASES

A few very-large-exposure cases account for a heavily disproportionate amount of payments, exposure, and (probably) expenses for most corporate claims and legal departments, and for most of the income and expenses of plaintiffs' law firms. These cases often require intricate analyses of tangled liability questions about plaintiffs' and defendants' actions, complex technical issues, conflicting expert testimony, and uncertain estimates of future expenses and lost income. Some cases are so complex that it is virtually impossible for any person to keep all the issues in mind, let alone recognize how they interact or how changes in one issue affect the others.

Decision analysis and rule-based modeling have been used to help litigants and lawyers analyze and evaluate such cases. Both methods lead claims persons or lawyers through an analysis of the entire case, identifying all important issues and their relationships, and thus enabling placement of a dollar value on the claim.

Despite their similar objectives, however, decision analysis and rule-based modeling are carried out very differently. Each has its uses and limitations. Decision analysis is entirely quantitative. It describes a claim in terms of probabilities that each issue or fact will be established, dollar amounts of losses, likely outcomes, and so on. It then combines probabilities and dollar amounts to calculate the likely outcome if the claim is tried or settled.

Rule-based modeling is verbal and logical. It describes a claim as a series of facts, arguments, and conclusions using English rather than numbers alone to describe each. The overall analysis is a line of reasoning that shows how facts and arguments lead to a series of conclusions about the value of the claim.

There are advantages and disadvantages to using either method for analyzing extraordinary claims, but rule-based modeling also has a broader use for the administration of litigation. A decision analysis is confined to a single claim—the analyses from previous cases cannot be used again and new claims require new analyses. Rule-based modeling, in contrast, preserves, accumulates, and reapplyes the careful thinking that has gone into analyzing extraordinary claims. A company can thereby build up an "expert system" that embodies the approaches of the best claims persons and lawyers on its staff.
DECISION ANALYSIS

Decision analysis helps decisionmakers who face choices involving substantial risk and uncertainties. The decisionmaker assigns numerical values to all important choices and elements of a decision, usually dollar amounts and probability of occurrence. These numbers can then be combined into a numerical evaluation of the decision, e.g., assessment of the relative costs and benefits, or estimates of the probability that a decision will result in a given outcome.

Decision analysis has been widely used to guide business and military decisions. It is a staple of systems analysts, operations researchers, and business schools that have developed methods for identifying considerations important to specific decisions, and techniques for carrying out the often complicated calculations (see Raiffa, 1970, for a useful introduction to the method).

Recently, business consultants have been promoting decision analysis as a means for evaluating and negotiating large civil cases (Bodily, 1981). Decision analysis of a civil claim is developed through the collaboration of an adjuster or a lawyer with a decision analyst. With prompting by the analyst, the adjuster or lawyer identifies important issues in the case, and choices in dealing with the claim (e.g., settlement, trial, joining a potential indemnator). He then identifies alternatives for each issue (e.g., can a damage claim be rejected or will it be sustained?) and potential consequences of each choice. These alternatives are typically expressed as dollar values, each with an associated estimate of its probability of occurrence.

After the case has been broken down and quantified, the analyst uses this information to create a decision tree that displays all the important issues and probable outcomes for each issue. For example, an adjuster might identify only two issues for the case: (1) whether or not the insured manufactured the product that injured the claimant, and (2) the inflation rate to be used to calculate the present value of the claimant’s loss of future earnings.

Figure 6 shows the simple decision tree for this example. The adjuster believes there is a 70 percent chance of establishing liability. He believes that three values of inflation might be used and would result in valuing future lost income as $500,000, $400,000 or $300,000. The adjuster estimates that there is a 20 percent chance that future lost income would be $500,000; a 50 percent chance that it would be $400,000; and a 30 percent chance it would be $300,000. In this simple case, it can be seen that the expected value of the case is $273,000:

\[
[(0.3)(0) + (0.7)(0.2)(500,000) + (0.7)(0.5)(400,000) + (0.7)(0.3)(300,000)].
\]
Decision analysis is an effective means for organizing thinking about a complex lawsuit. During the interviews, the adjuster or lawyer responsible for the case will usually identify the important issues and many of their interrelationships. The decision tree is a helpful way to present this organization.

Decision analysis is also useful in facilitating settlements. A company or firm can show what issues it considered in reaching its conclusion about a claim. The decision tree provides a means for breaking up a complex claim so that parties can identify specific areas of agreement and disagreement (Raiffa, 1970).

The method is also sometimes touted as producing an “optimal” or “rational” estimate of what a defendant should pay or a plaintiff accept (Bodily, 1981). The probabilities associated with the alternatives for each issue are combined to produce a likely value for the outcome of the case or a distribution of likely outcomes.

Unfortunately, although decision analysis enables systematic consideration of all issues in complex cases, the calculation of a claim’s value may have little meaning. First, the probability estimates provided by litigators are questionable. Neither lawyers nor claims adjusters are trained in or used to providing probability estimates. They may do so if prodded, but their numbers may raise more questions than they answer. For example, if a lawyer says there is a 50/50 chance that a jury will find a product defective, is it his judgment that 50 percent of juries would find a defect and 50 percent would not? Or does
the 50/50 estimate also include uncertainty: The lawyer thinks that anywhere from 40 to 60 percent of juries would find the product defective? Or does 50/50 mean that he has no idea how often a jury would find a defect? Of course, even if we know what the lawyer means by this estimate, the actual likelihood of a jury finding the product defective might not even be close to 50/50. Since the results of decision analysis rest on these estimates, their unreliability raises questions about the value of the analysis.¹

Second, when a case entails numerous issues, there is no single right way to combine the probabilities. A pure application of this approach requires estimating the likelihood of all possible alternatives for the case. This is simple when there are only four alternatives, as in Fig. 6. But a complex case may involve many alternatives and issues: what law will apply, what evidence will be established, how credible will witnesses appear, what type of jury will be selected, whether third-party defendants should be named, and so on. To try to estimate the likelihood of all combinations of these alternatives is like trying to plan a chess game by estimating the chance of each possible succession of moves.

The difficulty is even greater if each probability estimate is an estimate of a range of uncertainty about the likelihood that an alternative will occur (e.g., if 50 percent does not mean exactly 50 percent but a figure anywhere between 40 percent and 60 percent) (Quinlan, 1982). The estimate of a case's value depends on what specific probabilities are used. A range of values can be fairly well estimated within which the true value is likely to be, but there is no single right value.

Third, methods for calculating the outcome of a case generally assume that the outcomes for the various issues are independent. For example, the analysis assumes—perhaps erroneously—that the likelihood of finding a plaintiff to be contributorily negligent is not affected by whether or not a particular deep-pocketed defendant will be included or dismissed from the case. But this assumption is often false: The resolutions of many issues in litigation may be interrelated.

Because of these problems, the estimate of present value provided by decision analysis cannot be regarded as "right," precise, or rational.

¹Rule-based modeling, discussed below, also depends upon an adjuster's or lawyer's assessment of elements of a case and, therefore, also does not provide a necessarily "correct" analysis of a case. But rule-based modeling goes well beyond the adjuster's or lawyer's assessment of probability; it attempts to capture reasoning that lies beyond probability assessments and all other conclusions about a case. Also, it does not require adjusters or lawyers to think in terms of probabilities, if that is an unnatural form of reasoning or one that is not routinely used. Unlike decision analysis, a rule-based model is intended to reveal the way a decision is reached, not simply to provide an optimal decision.
The analysis can help organize the issues of a complex claim, but neither defendant nor plaintiff should seize upon it as dogma or belabor the other side into accepting it as the “right” value.

Decision analysis even has its limitations in helping to organize a case. It can aid the identification of important elements of a large claim, but few lawyers or claims persons have the training to follow closely how decision analysis arrives at its outcomes. As Raiffa (1970) notes,

Since the calculations are extensive and complex, the experienced people in positions of management responsibility do not have the time or the detailed understanding to review them. Judgment as to the weight that should be given to various factors in the analysis is left to the analyst himself instead of to the judgment of people who have experience in the field that is being analyzed. (Pp. 270–271, quoting Admiral Rickover during Congressional testimony.)

RULE-BASED MODELING

Rule-based modeling has greater potential use. Rule-based models describe complex high-stakes cases entirely in terms and concepts used by managers, adjusters, and lawyers who must make decisions about those claims. As a result, all these people can participate in developing the models, and the models can be used readily during settlement negotiations to explain a party’s position on a claim.

Computer scientists developed rule-based models in the attempt to have them arrive at decisions as experts would. The models provide explicit descriptions of the reasoning process so that the experts themselves could improve and others could learn from the process. Models have been built to describe decisions made by doctors in medical diagnosis, by military personnel in selecting tactical targets, by geologists in exploring for minerals, by investment counselors, and other types of experts. Among their successful applications, one geological model located a previously unknown deposit of molybdenum.

Rule-Based Models of Litigation Decisionmaking

Rule-based models can be used in two ways in the administration of litigation. First, a model can describe how expert adjusters or lawyers would organize and handle a wide range of claims. These general models are called “expert systems.” Second, a specific rule-based model can analyze a single complex case, providing most of the same uses as decision analysis. The author and a colleague have developed
both types of rule-based models for product liability cases (Waterman and Peterson, 1981). The main features of rule-based modeling are similar for both of these uses.

All rule-based models are developed by interviewing experts, who describe their conclusions for a variety of actual claims. To see how each element of a claim influences an expert adjuster's or lawyer's conclusions, the interviewer changes the facts one at a time. For example, in a claim involving a defectively designed product, the insured may first be described as a retailer, then a small manufacturing company, then a large manufacturer; next, the interviewer may ask an adjuster or lawyer to evaluate claims for all three types of insureds if the claimant now alleges that the product was defective because its instructions were inadequate, rather than because it was improperly designed. By changing these facts one at a time, interviews develop precise descriptions of the reasoning that the experts use, e.g., that design-defect claims against manufacturers bring larger settlements than similar claims against retailers, or that claims against retailers produce larger settlements when the retailer should have known that the instructions were inadequate and did not instruct the purchaser on how to use the product.

All of the experts' reasoning is translated into "if-then" rules. Each rule describes the conclusion that the experts draw from a particular combination of facts. Table 3 gives examples of these rules, each of which can be examined and understood by itself.

The rules are written in such a way that they can be stored in a computer and used to analyze the facts of new claims. The model uses these rules to reach decisions about the claim. When the computer is given the facts of a new claim, it searches the stored rules and finds rules that are called for by the facts of that case.

The model uses the selected rules to add new information about the claim. Every time the computer finds a rule that matches the case facts, it treats the conclusion of that rule as a new fact in the case. For example, if a product liability claim includes two facts—that the product is a machine and is over 10 years old—then a stored rule might reach the conclusion that the implied warranty of fitness no longer applies to the product. This becomes a new fact: The implied warranty of fitness does not apply. The model will continue to search and select other rules that are called for by the original facts and conclusions of previously selected rules. It stops when it reaches a conclusion about the likely value of the claim.

The model organizes these rules into chains that represent chains of reasoning that experts might go through. In these chains the conclusions of earlier rules become premises of subsequent rules. Figure 7
Table 3
EXAMPLE OF RULES FOR A RULE-BASED MODEL

(NOTE: These are illustrative rules obtained from interviews with a plaintiff’s lawyer. Rules obtained from claims personnel would undoubtedly differ.)

[7] If blindness in one eye, severe dizziness, sexual loss, paralysis of one limb, hand or foot, or loss of one limb, hand or foot then it is a disability of an important function.

[18] Let the value of glaucoma be $100,000.

[42] If the plaintiff did exaggerate the extent of the injuries or the plaintiff did overrun the medical expenses, then assert the plaintiff is puffing and increase the subtractions for discount by 10 percent of the adjusted value of the case.

[52] If the plaintiff does have a chance of contracting a serious illness and that chance is less than or equal to 15% and greater than 5%, then increase the future trauma factor by 30% of the value of contracting that illness.

[60] If the plaintiff did not wear glasses before the injury and the plaintiff’s injury does require the plaintiff to wear glasses, then increase the faculty loss factor by $1500 and increase the inconvenience factor by $1500.

[68] If the plaintiff’s injury does cause a temporary disability of an important function and the plaintiff’s doctors were not completely certain that the disability was not permanent and the plaintiff’s recovery is complete and the condition is fixed, then increase the fear factor by $1000 per day, but not by more than $10,000.

[70] If one of the plaintiff’s eyes is injured and the injury is to the eye itself and the treatment for the eye does require surgery and the recovery from the injury is almost complete and visual acuity is slightly reduced by the injury and the condition is fixed then increase injury trauma factor by $10,000.

[47] If the victim is an adult who knows the proper use of the product and the victim knows “the product is defective” and the victim continues to use the product or the victim knows “the product is dangerous” and the victim is careless in the use of the product or the victim is inattentive in the use of the product, or the victim is improper in the use of the product and there is a warning by the manufacturer and that warning describes the improper use of the product, or there is a warning by the seller and that warning describes the improper use of the product, or the victim knows that the victim is sensitive to the product or the victim uses poor practices in the use of the product, and the victim does continue to use the product, or there is a means for protection from the hazard of the product and the victim does not use that means, then conclude true the victim does not use ordinary care.
shows how some facts about a claimant's injuries combine in various ways to determine general damages for the claim. In turn, the calculation of general damages becomes a fact that is a premise for further rules that calculate the overall settlement value of the claim. All the chains of reasoning come together at the final conclusion about case value to form a decision tree (Fig. 8). (Note that although both decision analysis and rule-based models produce decision trees, the trees are based on different types of reasoning.)

Fig. 7—General analysis of the case
Rule-based models are built to reproduce how expert lawyers or adjusters handle actual claims. These experts not only provide the original rules, but they also help correct and refine the entire model as it is being programmed. They review each rule and also the chains of rules that are used to analyze new cases.

Even though the initial rules were drawn from interviews with only a few expert adjusters or lawyers, a company or law firm can build a model that captures the opinions and expertise of many persons. The model is extended by letting other adjusters and lawyers review the
analyses (as decision trees) for specific cases, so that they can critique the model, suggesting refinements and additional rules.

Models of Complex Cases

We have used rule-based models at the Institute for Civil Justice to analyze large, complex cases (Waterman and Peterson, 1981). To build a model of a specific case, an adjuster or lawyer works with an analyst, going carefully through their case and examining each issue in detail. They discuss all evidence and legal rules that might apply to the case and develop model rules that encapsulate their significance. These rules are stored in a computer.

The analysis shows how all issues are related. The overall organization of the case is shown as chains of rules that produce a decision tree. The decision tree can be used to get an overall view of the case, or to look in detail at the issues for one part of the case so that all staff members working on the case will have a common understanding. Because the entire analysis is spelled out as simple “if-then” rules that can be separately examined and understood, the model’s analysis of the case should be readily comprehensible to everyone—unlike the mathematical calculations of decision analysis, which are beyond the experience of most lawyers, managers, and adjusters.

The computer generates new analyses of the entire case, given any different combination of evidence, legal argument, strategies, or other elements. It traces how a change in one element of the case might result in a different chain of reasoning, affecting other elements. For example, if a court applies the Sindell rule—holding an insured manufacturer liable for its “market share” of the plaintiff’s damages—there may be a greater chance that a company’s insured will be found liable; the plaintiff’s damages might be valued higher; the insured’s share of such damages might be reduced; the value of indemnification suits against co-defendants might be reduced; and so on.

General Models

In addition to analyzing single complex cases, a rule-based model can be used to build a general model that will serve a number of purposes for administration of litigation. The general model permits careful management review of the best legal and claims analysis within the company or firm. By reviewing the model’s analysis of specific claims, supervising lawyers or executives can be sure that they agree with the expert analysis—that those analyses are reasonable and serve the company’s or client’s interests (e.g., do they make appropriate
assessments of general damages? Do they effectively use collateral sources?). By reviewing the model, managers will have a detailed understanding of how their top people are reaching decisions, and the opportunity to comment on and improve those practices.

A rule-based model provides an “institutional memory,” a means of preserving expert analyses performed in an organization, even if key personnel are no longer available. However, the model is not simply a historical archive since it can be updated and improved by the addition of new rules and new ways of claims handling.

Like the other tools described herein, a rule-based model cannot supplant an adjuster’s or lawyer’s individual judgment. But more than any other tool, a user can work with a rule-based analysis combining his own best judgment with that of the model. He can change or add new rules and then rerun the analysis to explore the implications of those changes. The model will produce a new chain of rules and, perhaps, a different outcome.

Development of a Rule-Based Model

All rule-based models are developed in the same way, and the development affords a valuable exercise for an organization’s staff. Each manager, adjuster, or lawyer working on the case can review, reexamine, and improve not only his own analysis but that of others who are developing the model.

The participation of outside analysts and computer scientists will still be necessary, however. It is unlikely that any company or firm has personnel who are familiar with the techniques of developing rule-based models and with the computer languages used in their development. Computer scientists have developed increasingly refined, specialized computer languages to describe and operate the if-then rules used in the model. Our work on rule-based models of legal decisions is implemented in ROSIE (Waterman et al., 1979), a computer language that facilitates the development of a large expert system using English-like syntax. ROSIE is the descendant of computer languages used to develop earlier expert systems, such as RITA (Anderson and Gillogly, 1976) and MYCIN (Shortliffe, 1976), and in turn has been improved with ROSIE-II.
COMPARISON OF DECISION ANALYSIS AND RULE-BASED MODELS

Both decision analysis and rule-based models have their advantages and disadvantages. As an established method that is familiar to many consultants and businessmen, a decision analysis is fairly easy to develop and to present to claimants and other parties to litigation.

Being numerical, the method can reflect the uncertainty that is common in litigation, and it produces a simple numerical answer showing the dollar impact of alternative dispositions of a claim. But this numerical basis of decision analysis is also the source of its limitations. In discussing and thinking about claims, managers, adjusters, and lawyers use verbal reasoning, not complex mathematics. Not fully understanding how the decision analysis operates, they must rely on other experts to critique or defend the method. Finally, since calculations based on probabilities are generally arbitrary, it is hard to justify or accept them uncritically.

Although it produces conclusions about dollar amounts, rule-based modeling is verbal, not numerical, and is therefore more accessible to managers, adjusters, lawyers, and litigants.

The two methods deal differently with the uncertainty that is so common in handling claims—uncertainties about whether specific facts can be proven, what law will apply, how credible witnesses will appear, and so on. Decision analysis is designed to guide uncertain decisions by using adjusters' or lawyers' estimates of the probabilities of uncertain events during litigation. This approach seems straightforward, but in fact the probability estimates may have little validity or meaning.

Rule-based models try to minimize uncertainty by exploring the conditions under which adjusters believe that each of several possible alternatives will occur. For example, rather than specify a 60 percent certainty that the jury will believe a claimant's medical expert (as decision analysis might do), a rule-based model might list the conditions under which the expert is likely to be believed (e.g., if the expert is the claimant's regular doctor, is the claimant's treating doctor hired before the claimant filed a claim, etc.).

But rule-based models of litigation cannot change all uncertainties into more detailed, specific rules. There will still be some uncertainties about what evidence will appear, about whether a medical condition is permanent, and so on. Where uncertainty cannot be eliminated, rule-based models attempt to reproduce how expert adjusters and lawyers actually deal with that uncertainty. For example, the models we have developed at the Institute for Civil Justice reflect adjusters' compromises for uncertainty about liability. Thus, if an adjuster thinks there
is an 80 percent chance that a jury would find liability, he will agree to
a settlement that is about 80 percent of the plaintiff's damages. Other
techniques are being developed to make rule-based models more effective
in helping experts make better decisions when faced with uncertainty, but most of these methods are still in early stages of develop-
ment.²

This raises another difference between decision analysis and rule-
based models. While decision analysis is an established method, rule-
based modeling is new: Its techniques are still being developed. Rule-
based modeling perhaps promises greater utility, even in the current
early stages of the method's development, but the method has a shorter
track record. The only rule-based models of litigation decisions have
been those developed at the Institute for Civil Justice.

Combining Methods

As Table 4 indicates, the four methods—open claim analysis, closed
claim analysis, decision analysis, rule-based modeling—have com-
plementary uses for administration of litigation. Open and closed
claim analyses provide inventories of cases and aids to help adjusters
or lawyers handle most cases. Either decision analysis or rule-based
modeling helps adjusters and lawyers organize, prepare, and negotiate
extraordinary claims.

<table>
<thead>
<tr>
<th>Case Size</th>
<th>Inventory</th>
<th>Routine Handling</th>
<th>Systematic Analysis</th>
<th>Accumulation of Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small</td>
<td>Open</td>
<td>Open</td>
<td>Closed</td>
<td>Rule/Closed</td>
</tr>
<tr>
<td>Moderate</td>
<td>Open</td>
<td>Closed</td>
<td>Closed</td>
<td>Rule/Closed</td>
</tr>
<tr>
<td>Large</td>
<td>Open</td>
<td>Closed</td>
<td>Rule/Decis</td>
<td>Rule</td>
</tr>
<tr>
<td>Extraordinary</td>
<td>Open/Closed</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Table shows tasks that can be performed by open claim analysis
(Open), closed claim analysis (Closed), rule-based modeling (Rule), and deci-
sion analysis (Decis).

²Some rule-based models have attached estimates of probabilities for each fact that
appears as a premise in a rule and then use methods similar to those of decision analysis
to combine these probabilities. (Davis, 1979; Shortliffe and Buchanan, 1975).
But the uses of some methods overlap, so that a company or law firm can benefit from applications that combine methods. Closed claim analyses are more elaborate and sophisticated versions of open claim analysis. If a company or firm develops a closed claim analysis, it receives all of the benefits of open claim analysis, plus greater management review and a tool for helping adjusters and lawyers estimate and prepare new claims.

General rule-based models can also be used to help estimate and prepare new claims. While closed claim analysis gives adjusters and lawyers information about the outcomes (and expenses) for past claims, a rule-based model provides an analysis of a claim based on the greatest expertise available within a company or law firm—it is like having top adjusters or lawyers consult on the claim.

A general rule-based model can be combined with closed claim analysis. The model’s analysis of a claim would be based on the facts entered about a case for a closed claim analysis. Where a claim involves substantial stakes and an adjuster or lawyer wants some help in analyzing or preparing the claim, he could simply ask for a rule-based analysis of the data that he has entered.

These two methods—closed claim analysis and rule-based modeling—are also valuable training devices. Both accumulate information about the company’s claims handling, and organize that information so that it can be used to train new and experienced lawyers or adjusters. Closed claim analysis shows how past claims have been handled; it shows patterns of past settlements, suggests the range of reasonable future settlements, and also reveals where case handling can be improved.

Because rule-based models preserve and accumulate the knowledge and strategies of a company’s best adjusters and lawyers, they provide an efficient means for less experienced adjusters or lawyers to observe and learn from the experience. Also, as part of training, less experienced personnel can try out different strategies and analyses by changing facts or rules and seeing how the model’s analysis of the claim changes. Rule-based models are so useful as training devices that a company or firm might want to develop a model first for training and then later expand it to help adjusters or lawyers handle actual claims.

CONCLUSION

New computer and information methods like those described in this report hold perhaps the greatest promise for organizations to reduce, or at least control, litigation expenses. It is unlikely that the volume of
civil litigation will decrease in the near future; if anything, it is more likely to increase, with expanding theories of liability and the matura-
tion of environmental hazard claims. Court reforms, too, seem to offer little promise for reducing the costs of litigation (see, e.g., Hensler, Lipson, and Rolph, 1981).

Law firms, insurance companies, and other frequent litigants will be most likely to reduce litigation expenses through better cost account-
ing, improved training and supervision of litigation personnel, and more systematic use of information to reach timely and reasonable appraisals of civil claims. The four methods described in this report can contribute to such improvements. Each provides a means to organize and exploit the significant information and experience present in every organization that is frequently involved in litigation.

Finally, it is important to emphasize that the methods can have benefits that extend beyond those to law firms and companies that are actually using them. As parties use the methods to obtain better analyses of the issues and costs involved in their litigation and more information about the likely outcomes of those cases, they should reach settlements faster and more often (Waterman and Peterson, 1981). If so, these methods will broadly benefit not only those who are involved in our system of civil justice, but also the taxpayers who support that system.
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