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Sequencing and Allocating Attorney Time to Cases

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The purpose of this article is to discuss how attorneys can better sequence and allocate their time in processing cases by making use of modern management science methods. Such methods can maximize benefits while complying with ethical constraints. The article also emphasizes making use of records that show the amount of time spent on various cases and the results obtained. The records could come from one's own firm or from a set of firms whose time-and-results records are available through a looseleaf service.

The article is divided into two parts. The first part of the article is concerned with the order in which cases should be efficiently handled. Ordering is necessary unless there are as many lawyers in the law firm as there are cases. Then no case would be taken unless a lawyer is free to work on the case. That way there is no backlog and no need for sequencing. So long as there is a backlog of at least two cases, there is a need for the next available lawyer to decide the most efficient order in which the cases should be processed. Processing cases on a first-come, first-served basis may not be the most efficient procedure from the perspective of maximizing the benefits minus the costs of either the firm or the clients.[1]

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1. For literature on optimum sequencing of events as a management science problem, see K. BAKER, INTRODUCTION TO SEQUENCING AND SCHEDULING (1974); R. CONWAY, W. MAXWELL & L. MILLER, THEORY OF SCHEDULING (1967); and S. RICHMOND, OPERATIONS RESEARCH FOR MANAGEMENT DECISIONS 461-480 (1968). No literature has been found dealing with optimum sequencing of cases in a law firm, but there are articles dealing with optimum sequencing of cases in the judicial process. *See*

The second part of the article is concerned with the amount of time to devote to each case. Time allocation is necessary because devoting too little time to a case may result in losing a contingency fee and may be unethical regardless of the fee arrangement. Likewise, devoting too much time to a case may be wasteful under a contingency fee or a flat fee, and may be unethical under an hourly fee. One thus wants to find the optimum time level for each case where doing too little or too much is undesirable.[2] The time-allocation portion of the article is shorter than the case sequencing portion because the time allocation problem has been discussed in previously published articles, but systematic case sequencing by lawyers has not been previously analyzed.

I. PRELIMINARY INFORMATION

A. The Illustrative Data

Table 1 provides a set of hypothetical data that can be used to illustrate the principles of this article regarding optimum sequencing and optimum time allocation levels. The data concerns twelve cases that correspond to four casetypes. The four casetypes might be medical malpractice, antitrust, product liability, and automobile accident cases, or any set of casetypes as defined by the nature of the specialization of the law firm in question.[3] In Columns 1 and 2, twelve sam-

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Hausner, Lane & Oleson, *"Automated Scheduling in Courts,"* in OPERATIONS RESEARCH IN LAW ENFORCEMENT, JUSTICE, AND SOCIETAL SECURITY (S. Brounstein & M. Kamrass eds. 1976); TASK FORCE ON THE ADMINISTRATION OF JUSTICE, THE COURTS 88-90, 165-167 (1968); and Nagel & Neef, *Time Oriented Models and the Legal process: Reducing Delay and Forecasting the Future*, WASH. U.L.Q. 467, 474-82 (1978). Optimum sequencing in the judicial process is concerned mainly with reducing the average waiting time, whereas optimum sequencing in the practice of law is concerned mainly with maximizing income minus expenses.

2. For literature on finding an optimum level of activity where doing too much or too little is undesirable, see M. WHITE, et al., MANAGING PUBLIC SYSTEMS: ANALYTIC TECHNIQUES FOR PUBLIC ADMINISTRATION 278-90 (1980); and S. NAGEL, POLICY EVALUATION: MAKING OPTIMUM DECISIONS 81-178 (1982). For applications to the problem of how much time to allow court cases or stages in court cases, especially criminal cases, see TASK FORCE ON THE ADMINISTRATION OF JUSTICE, THE COURTS 84-88 (1967); and Nagel & Neef, *Time Oriented Models and the Legal Process: Reducing Delay and Forecasting the Future*, WASH. U.L.Q. 467, 490-494 (1978). For applications to the problem of how much time attorneys should allow for civil cases, see F. MACKINNON, CONTINGENT FEES FOR LEGAL SERVICES: A STUDY OF PROFESSIONAL ECONOMICS AND RESPONSIBILITIES (1964); Kritzer, et al., *Understanding the Costs of Litigation: The Case of the Hourly-Fee Lawyer*, AM. BAR FOUNDATION RES. J. 559-604 (1984); and Nagel, *Attorney Time Per Case: Finding An Optimum Level*, 32 U. FLA. L.R. 424-441 (1980).

3. The writer gratefully thanks Professor Arthur Robinson of the University of Illinois, School of Engineering, for having suggested this data. It was originally part of his class assignment designed to illustrate the use of dynamic programming as a form of operations research. The data, however, can be more easily analyzed by following the principle of choosing the cases in the order of their B/C ratios until one's budget or time runs out. Dynamic Programming in this context involves choosing cases by going through a series of stages and doing a separate optimizing at each stage. For literature

TABLE 1. SEQUENCING ATTORNEY TIME TO CASES WITH ONE BENEFIT MEASURE

(1) IDENTIFICATION	(2)	(3) CRITERIA	(4)	(5) OVERALL SCORES	(6)	(7)
Case	Casetype	Hours (C) (1H=$100)	Benefits (B) (1B=$100)	B/C Ratio (4)/(3)	B-C Difference (4)-(3)	(B-C)/C (6)/(3)
1	A	10	21-	2.10	11	1.10
2	A	20	61*	3.05*	41*	2.05*
3	A	30	80*	2.67	50*	1.67
4	B	10*	20-	2.00-	10	1.00
5	B	20	45	2.25	25	1.25
6	B	30	55	1.83-	25	.83
7	C	10*	30-	3.00*	20	2.00*
8	C	20	45	2.25	25	1.25
9	C	30	45	1.50-	15	.50
10	D	10*	25-	2.50	15	1.50
11	D	20	60	3.00*	40	2.00*
12	D	30	85*	2.83	55*	1.83
TOTALS		240	572	29.00	332	17.00

NOTES:

1. Columns 3 and 4 show hypothetical data which could be obtained from the records of a law firm or a looseleaf service which compiles information on cases as to damages awarded, hours worked, and other characteristics.
2. The asterisks in columns 3 and 7 show the three best cases on each column from the perspective of the plaintiff lawyer. The hyphens in columns 4 and 5 show the three best cases on each column from the perspective of the defendant lawyer.
3. The B/C ratios in column 5 provide the order for sequencing the cases to maximize total benefits minus costs. The B-C differences in column 6 show the optimum level of hours for each casetype to maximize total benefits minus costs.

ple cases are divided into four different types labeled A, B, C, and D.

Column 3 shows the hours spent on each of these twelve cases according to the time and billing records of the law firm. The column provides a measure of the cost incurred in each case, assuming that an hour's time is worth $100 to a prominent law firm and also recognizing that the arithmetic is simpler by using a round number. Other variable costs could also be included for each case, as contrasted to the fixed costs of the law firm which are not attributable to specific cases. For the sake of simplicity, however, other variable costs are left out.

Column 4 shows the fee obtained in each of these cases. The fee is expressed in terms of benefit units, each one of which is worth $100. Thus, the first case involved ten cost units or $1,000 and twenty-one benefit units or $2,100. The numbers in the benefits column can be considered as benefits that have already been discounted for the probability of their being received and discounted for delay where the payoff does not occur until substantially later.

Column 5 shows the benefit/cost ratio (hereinafter referred to as B/C) or efficiency ratio for each case by dividing column 4 by column 3. Column 6 shows the benefit/cost difference or profit for each case by subtracting column 3 from column 4. This article will help demonstrate that the B/C ratios are needed for sequencing cases in order to maximize total benefits minus costs of the firm over the course of a year or other time period. This article will help demonstrate that the B-C differences are also needed for allocating time to each case in order to maximize total benefits minus costs of the firm.

Note that all the cases are predicted to be profitable in the sense that the B/C ratio is greater than 1.00 and the B-C difference is always positive. Otherwise a firm would not deliberately take a case to begin with, unless the firm is taking the losing case in order to please the client who might later provide the firm with a big winner.

B. Predicting Costs and Benefits

A data table like Table 1 can serve two important purposes. One is to make sequencing and allocating decisions where the data table represents incoming cases that have not yet been processed. A second purpose is to make predictions concerning incoming cases with regard to how many hours each case is likely to consume and what the benefits or income is likely to be from each case.

The predictive purpose, rather than the decision making purpose,

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on a dynamic programming approach to this kind of data, *see* D. MEREDITH, et al., DESIGN AND PLANNING OF ENGINEERING SYSTEMS (1985); *see also* G. NEMHAUSER, INTRODUCTION TO DYNAMIC PROGRAMMING (1966).

can be used to predict future time consumption from a data table like this by the following two steps:

1. Determine the casetype for the incoming case. Narrowly classifying the cases may give precision in describing the cases, but if the categories are too narrow, then the sample sizes may be too small to generalize from.
2. Observe the average number of hours for cases of the appropriate casetype. For example, if an incoming case fits Casetype B, then it would be reasonable to predict that the incoming case will probably take about 20 hours. We have three examples of Casetype B in our data table. They took 10, 20 and 30 hours respectively, thereby averaging 20 hours for the set of three cases.

There are more complicated ways of predicting how much time cases will consume, but this method is sufficient for later illustrating what one does with predicted case time.

One can likewise predict benefits or income per case using a similar two step approach.

1. Determine the casetype for the incoming case.
2. Determine the average benefits or income for cases of the appropriate casetype. For example, if an incoming case fits Casetype B, then it would be reasonable to predict that the incoming case will probably bring in about 162/3 benefit units, or 54 benefit units, or $5,400.

II. Optimum Sequencing

Suppose we now consider the data in Table 1 to represent twelve incoming cases, rather than twelve past cases. Suppose further that these cases represent the total backlog of our small law firm, and this is the beginning of the week. In what order should we process these cases?

Some attorneys might say, process the cases on a first-come, first-served basis since that rule seems fair and it avoids having to think about how the sequencing could be done better. First-come, first-served is not necessarily fair since it may mean that short cases and others may have to wait a long time to be processed because a long case came in ahead of them. If the cases are processed with the shortest cases first, the average delay will be substantially reduced without necessarily causing the maximum delay to become unreasonable or unethical, assuming the long cases are flagged for processing before they exceed a maximum constraint.

Other attorneys might say process the cases by a variety of sequencing methods that make no sense in terms of maximizing the income minus expenses of the firm such as:

1. Take the shortest cases first to get them out of the way, rather than to reduce the average delay to clients.
2. Take the longest cases first to get them out of the way.

3. Take the most profitable cases first to bring in working capital.
4. Take the least profitable cases first to get them out of the way and to have the more profitable cases to look forward to.
5. Other sequencing methods.

A. Sequencing by B/C Ratios

Before discussing the defects in the above methods, we should clarify the correct method. It involves taking the cases in the order of their benefit/cost ratios. Suppose we have a 40-hour week and one attorney. How should that 40-hour week be most efficiently spent in processing these twelve cases? We should take Case 2 first since it has the highest benefit/cost ratio at 61/20 or 3.05. We should then take Case 7 since it has the second highest benefit/cost ratio at 3.00, although Case 11 also has a 3.00 B/C ratio. When two cases have the same B/C ratio, prefer the case with the shorter hours in order to reduce the average waiting time per client. If we take all three cases, the total number of predictive hours is 50 hours. That means the second 10 hours of Case 11 are postponed or continued to next week.

If we follow that procedure, then we will have incurred 40 hours of cost or $4,000. We will have obtained predicted benefits equal to 61 plus 30 plus half of 60, for a total of 121 benefit units, or $12,100. We are figuring half the 60 benefit units for Case 11 because we have put in half the predicted 20 hours that are needed to complete the case. We could say there are no benefits until the case is completed. That would be the equivalent of operating on a cash accounting system, rather than an accrual accounting system, although the accrual system generally makes more sense. As a compromise we could accrue 30 benefit units when we complete 10 of the 20 hours. After completing the full case and seeing the case took fifteen hours, we could then adjust the benefit units we assigned to the previous week to be $^{10}/_{15}$ or $^{2}/_{3}$ of 60 benefit units which means 40 units rather than 30. Since reports are normally only prepared on an annual basis, those adjustments would only have to be made once per year in our time efficiency records. Those adjustments would not have to be made at all if we are just seeking to establish the proper sequencing rule.

Assuming the predicted benefits are reasonably accurate then we will have made a profit of 121 minus 40 profit units, or a profit of $8,100. There is no combination of cases that can add up to 40 hours that would bring in a bigger profit. By sequencing the cases to bring in bigger profits early, we are *not* going to change the total profit for the twelve cases. The total profit for the twelve cases will still be 332 profit units. The advantage of collecting fees from the more efficient cases first is that doing so enables us to obtain more working capital as early as possible to plow into the development of the firm or to invest for obtaining interest. Thus, if we add the interest obtainable

to the profit figures in column 6, the optimum sequencing of taking the cases in the order of their B/C ratios will give us the greatest total profit plus interest.

B. Maximum Time Constraints as Supplements

If one strictly follows the optimum sequencing principle of taking the cases in order of their B/C ratios, then a case with a low B/C ratio like Case 9 might never be processed. To prevent that from occurring, maximum constraints are needed on each case. Those maximum constraints should reflect the statute of limitations and whatever the attorneys involved consider to be a reasonable maximum. When the maximum date is approached, minus the predicted number of working hours, minus some leeway for error, a good scheduling system should flag the cases involved in order to get them started and/or completed before the expiration of the time for starting or completing them.

Another aspect of optimum sequencing that tends to keep the accepted cases with relatively low B/C ratios from being put off too long is the optional rule that says at the beginning of each week or other time period, new cases should be scheduled for getting started. That means a low B/C case from last week should go ahead of a high B/C case from next week. Thus, the sequencing by B/C ratios can be just within a given time cluster or cohort. That rule is designed to supplement the flagging system when optimum sequencing is used by courts to reduce delay, although it does not have to be part of optimum sequencing when used by law firms to improve their cash flow for maximizing income minus expenses.

C. Sequencing by B-C Differences

The leading contender to sequencing the cases in the order of their B/C ratios is the idea of sequencing them in the order of their B-C differences. At first glance, that sounds reasonable since we want to maximize benefits minus costs, but in terms of our annual or weekly profit and loss statement, not in terms of the order in which we process the cases.

If we process the cases in the order of their B-C differences, or their individual profitability, then we would process Case 12 first, not Case 2. Processing Case 12 would use 30 hours and bring in 85 benefit units. We would then process Case 3 since it has the second highest B-C difference. Completely processing that case would consume

an additional 30 hours, but we only have a 40 hour week. We therefore process only 10 of the 30 hours. As before, we prorate the 80 benefit units by only accruing one third to this week or 27 benefit units. Adding 85 and 27 gives a total of 112 benefit units or $11,200. The B/C sequencing gave $12,100 for the same 40 hours, although sequenced differently. This means by using B/C sequencing, we gained an additional $900 that week to invest in the firm or to draw interest. We could have used hypothetical numbers that would have made the difference between the two approaches equal to $9,000 or $90,000, rather than $900.

If we have the unusual situation where all the cases take exactly the same amount of time, then sequencing by B-C would give the same result as sequencing by B/C or by B alone. Likewise, if all the cases produce the same benefits even though they vary in hours required, then sequencing by B-C would also give the same result as sequencing by B/C or by C alone. If all the cases had the same benefits and costs, then one could get the same total profit by taking the cases in any order.

D. Other Alternatives

B/C divided by C is referred to as the *yield ratio*. It can be interpreted as a percentage of profit returned to each hour. Thus a yield of 2.00 means a 200% return of $2,000 on one's investment of $1,000 worth of time as shown in column 7 for Case 7. Sequencing in order of yield gives the same results as sequencing in order of efficiency. This is so because the yield ratio is always equal to the efficiency ratio minus a constant 1.00. One can show algebraically that $(B/C)/C = B/C - C/C = B/C - 1$, or the reverse. Using yield ratios involves a little more arithmetic, but for many people such ratios are more understandable to use in sequencing because they do include a profit calculation in the numerator. The yield ratio is also useful later when we deal with nonmonetary benefits.

At first glance, one might think that the sequencing solution might be influenced by the order of the *listing* of the cases, and that we would obtain a different result if the cases were listed from Case 12 down to Case 1 instead of from Case 1 up to Case 12. There would be a difference in the sequencing, but not in the bottom-line profit of total benefits minus costs. If the cases were reversed, the best case to take first would still be Case 2 for 20 hours. The second case, though, now would be Case 11 rather than Case 7. If we take Case 11 for its 20 hours, then we have used our 40 hours. The total benefits would be 61 for Case 2 and 60 for Case 11 for the same total of 121 and $1,200. This is so because Case 11 has the same B/C ratio as Case 7,

and the B/C ratios do not change as a result of how the cases are listed and thus seen.

To understand optimum sequencing, it is also helpful to show the defects in other forms of sequencing which would not produce optimal results. For example taking the *shortest cases* first to cover our 40 hours would mean Cases 1, 4, 7, and 10. The total benefits would then be 21 plus 20 plus 30 plus 25 for a rather low 96 or $960. Taking the shortest cases first is the optimum sequencing approach for minimizing average waiting time rather than maximizing profit. It is thus a useful sequencing method for the courts to use in sequencing court cases subject to maximum time constraints.

Taking the cases in the order of their *benefits* and ignoring costs will result in a lower total profit than the $12,100 of B/C sequencing. By coincidence with the data in Table 1, the sequencing by benefits is the same as the B-C order because Cases 12, 3, and 2 are the three best cases on both benefits and benefits minus costs, although only Case 2 is in the top three on the more important criterion of the B/C ratio. We could easily change that coincidence by assuming that Case 3 requires 40 hours. Then Case 3 would no longer be in the top three on B-C but would still be in the top three on total benefits. If we then allocate 30 hours to Case 12 and the remaining 10 hours to Case 3, we would receive 85 benefit units plus one fourth of 80 for a total of 105, or only $10,500.

From this analysis of alternatives to B/C sequencing and the previous analysis of the benefits of B/C sequencing, one can conclude that it is the most meaningful way to efficiently sequence cases in a law firm backlog. That is partly why it is called the efficiency ratio. One must, however, emphasize that sequencing by B/C ratios is only a means to a higher goal which is maximizing total benefits minus costs.

III. SEQUENCING FROM DIVERSE PERSPECTIVES

A. Lawyers for Civil Defendants

Suppose Table 1 were viewed from the perspective of a law firm that only does defense work in damages cases. Therefore, all the figures in column 4 are detriments or additional costs, and not benefits from the defendant's perspective if those are amounts that are likely to be paid out. Assume also for the sake of simplicity that the defense side has to put in as many hours preparing and conducting

each case as the plaintiff side does. How then, should a defense firm sequence these 12 cases?

At first glance, the answer might be to delay the biggest payout cases as long as possible and therefore take the smallest payout cases first which would mean Cases 1, 4, 7, and 10. The total payout for those four cases would be only $9,600. This can be contrasted to spending 40 hours completing the big payout cases of Case 12 and Case 3. Just as the plaintiff's lawyer wants to bring in the bigger profits early to have the money available for working capital or investment, so also the defendant's lawyer wants to retain the big payouts until later in order to have that money available for working capital or investment.

At second glance, sequencing the cases in the order of their payouts would be as bad from a defense perspective as it would be from a plaintiff perspective. The defense lawyer who is usually an attorney for an insurance company would be much better serving his or her insurance firm by sequencing the cases in the order of their detriments/costs ratio taking the cases with the lowest ratios first. That means the insurance firm lawyers (if they feel an obligation to put in 40 hours) should first work on Case 9 which has a 1.50 detriments/cost ratio. That would consume 30 hours and result in a payout of $4,500. The insurance company attorney should then work on Case 6 for the remaining ten hours. That will result in a prorated payout of one third of 55 or 18 detriment units, or $1,800. The total payout will then be only $6,300 as contrasted to taking Cases 1, 4, 7, and 10 which generate a payout of $9,600.

If lawyers for plaintiffs seek to maximize their profits, then the cases with the *highest* benefit/cost ratios will get pushed for early resolution. If defense lawyers for insurance companies seek to maximize their profits, then the cases with the *lowest* ratios will get pushed for early resolution, although the insurance companies would prefer to have zero losing cases resolved if that were possible. The important point here is that both sides cannot completely succeed in their opposite strategies. This is a key reason why a plaintiff's attorney cannot start a case on one day and keep working at it until it is finished. That does not happen partly because completing the case may require waiting for the defense side who is in no hurry to cooperate. It may also require waiting for the court system which has its own backlog and sequencing strategies. Nevertheless, one should still try for optimum sequencing. When one tries for the optimum and only half succeeds, one has still achieved a lot more than if one tries for less than the optimum and only half succeeds.

B. Lawyers in Criminal Cases

One can also use Table 1 to illustrate optimum sequencing in criminal cases from either a prosecutor or defense attorney perspective. The *prosecutor* in criminal cases in this context is like the plaintiff in civil cases. The prosecutor gets glory from winning big cases. Prosecutors like to win big cases as early in their terms as possible so as to bask in that glory for as long as possible. Basking in glory is to prosecutors what interest or return on monetary investment is to attorneys who specialize in bringing damage cases. Suppose the benefits column from the prosecutor's perspective represents years of imprisonment. The prosecutor should thus sequence the cases in the order of their benefit/cost ratios. Doing so will result in maximizing total imprisonment years which can be used as a rough measure of how well a prosecutor is doing.

From the *defense attorney*'s perspective, the object is to get the sentences down as low as possible where there is going to be a conviction. All the cases in Table 1 involve convictions. We could have added some nonconviction cases by just inserting some zeros in column 4. We could have similarly added some nonliability civil cases. As with the civil defense attorney, criminal defense attorneys should be interested in keeping their capital punishment cases from being consummated more than their shoplifting cases. Likewise, a life imprisonment case is more of a loss than 30 days in jail, and one would expect defense attorneys to want to delay the embarrassment and regrets that are associated with having one's client sentenced to prison for life or a lengthy term. Assuming the defense attorney does want to minimize total prison time relative to the hours the defense attorney has available, then he or she should push the cases that have the lowest detriments/costs ratios, or ratios of prison years to attorney hours. That means taking Case 9 first and then one third of Case 6 for the coming 40 hour week.

C. Sequencing From the Client's Perspective

We have analyzed the sequencing problems of Table 1 from the perspective of the civil plaintiff's lawyer, civil defendant's lawyer, criminal prosecutor, and criminal defense attorney. What about the perspective of the client? In all these situations, the optimum sequencing from a lawyer's perspective is also the optimum sequencing from the total clientele perspective, although not necessarily from the perspective of any individual client. For example, the optimum

strategy of the civil plaintiff's lawyer is to take Case 2 first, then Case 7, and then half of 11. Doing so will maximize benefits gained at 121 units. The benefits column sums to 572 units. That means other clients will be unhappy to the extent of 572 minus 121 units or 451 units of deprived benefits. There is, however, no better way that the plaintiff's lawyer could sequence the cases in order to provide less than 451 units of unhappiness or more than 121 units of happiness. This assumes working a 40 hour week and that the predicted hours and benefits are reasonably accurate. The same analysis can be applied to showing the harmony between the civil defense attorney, the prosecutor, and the criminal defense attorney and their respective clients or salary payers.

The above analysis about the harmony between the interests of lawyers and their clients assumes that the benefits column in Table 1 represents benefits for both the lawyer and the client. If, however, the lawyer is getting paid an *hourly fee* which is dependent solely on the number of hours worked, rather than the benefits achieved, then the optimum sequencing might at first glance appear to involve taking the cases that have the most hours first. That, however, would not make sense since the lawyer would presumably be paid a certain amount of dollars an hour regardless whether it is an hour spent on a 10 hour case or 20 hour case. Therefore, even under an hourly rate, the lawyer can justify sequencing the cases in the order of their B/C ratios. Doing so maximizes the client happiness (as mentioned above) which should be an important consideration in lawyer decision-making.

One might also at first glance think that under a *flat fee* arrangement, a lawyer should sequence the cases to take the shortest cases first. That would make sense if the lawyer were being paid the same flat fee for all twelve cases, with no payment until each case is completed. If, however, the payment is at the time the case is accepted, then there is nothing to be gained by taking the shortest cases first. Therefore the lawyer who is paid flat fees in advance should sequence the cases in the order of their B/C ratios so as to maximize client happiness, and thereby increase repeat customers and referrals. The same is true if the lawyer is paid flat fees, but the flat fee tends to correlate with the predicted benefits. Under those circumstances, even if the lawyer is paid only after the case is completed, the sequencing should still be by B/C ratios in order to bring in early the bigger benefits and thus the bigger flat fees.

When sequencing cases, the interests of lawyers and their clients tend to be in harmony. That is not necessarily so when it comes to arriving at an optimum level of time to devote to each case as will be discussed later in this article.

IV. ADDITIONAL CRITERIA SUCH AS CASE ENJOYMENT

The above sequencing principles operate on the assumption that law firms and lawyers want to maximize their income minus expenses or benefits minus costs subject to ethical constraints, including maximum time constraints on processing the less desirable cases that one has accepted. The sequencing approach needs to be modified, however, if a law firm or a lawyer gets nonmonetary pleasures out of certain casetypes or cases more so than others. We might want to add a column to Table 1 that seeks to measure enjoyment received on a 1-5 scale. On such a scale, a 5 means strong positive enjoyment, a 4 means mild positive enjoyment, a 3 means neither pleasure nor displeasure, a 2 means mild displeasure, and a 1 means strong displeasure.

If we insert a column called psychological enjoyment benefits, we could not add the scores in that column to the scores in the dollar-benefits column to obtain a total benefits score. Likewise, we cannot subtract dollar costs from enjoyments benefits. We can, however, convert enjoyment benefits, dollar benefits, and dollar costs into dimensionless part/whole percentages by dividing each criterion figure per case by the total shown in the column. Doing so creates a set of percentages that can be meaningfully added and subtracted. If the lawyers can say how much more psychological enjoyment is worth to them than gaining dollar income or saving dollar costs this can be done effectively. If psychological enjoyment is worth twice as much, then the part/whole percentages in the enjoyment column all get multiplied by 2. Weighted part/whole percentages are generally easier for people to handle than trying to attach a monetary value to the 1-5 enjoyment units. Those ideas are implemented in columns 4-7 of Table 2.

When combining monetary and nonmonetary goals as Table 2 does, one should first combine $B and $C into a single monetary goal of $B and $C. The nonmonetary goals should also be combined if they are measured on the same scale, such as a 1-5 scale. If the non-monetary goals on the same scale differ in importance, one should indicate the relative weight of each non-monetary goal, and then multiply the scale scores by those weights when making the nonmonetary combination. By combining the monetary goals and the nonmonetary goals that can be combined, we thereby reduce the analysis in Table 2 to one composite monetary goal and as few nonmonetary goals as possi-

TABLE 2. SEQUENCING ATTORNEY TIME TO CASES WITH TWO BENEFIT MEASURES

(1) IDENTIFICATION	(2)	(3) HOURS	(4) B-C DIFFERENCE	(5)	(6) ENJOYMENT SCORE	(7)	(8) OVERALL SCORES	(9)
Case	Casetype		$	P/W%	1-5 Scale	P/W%	Sum of the Weighted P/W%'s (5)+2(7)	Sum/Hours (8)/(3)
1	A	10	$11	3%	2	6%	15%	1.50
2	A	20	41	12	3	10	32	1.60*
3	A	30	50	15	3	10	35*	1.17
4	B	10	10	3	1	3	9	.90
5	B	20	25	8	3	10	28	1.40
6	B	30	25	8	4	13	34*	1.13
7	C	10	20	6	1	3	12	1.20
8	C	20	25	8	2	6	20	1.00
9	C	30	15	5	3	10	25	.83
10	D	10	15	5	1	3	11	1.10
11	D	20	40	12	3	10	32	1.60*
12	D	30	55	17	5	16	49*	1.63*
TOTALS		240	332	100%	31	100%	300%	15.06

NOTES:

1. Columns 3 and 4 come from columns 3 and 6 of Table 2.
2. The enjoyment scores of column 6 are measured on a 1-5 scale with 5 = strong positive enjoyment, 4 = mild positive enjoyment, 3 = neither positive nor negative enjoyment, 2 = mild displeasure, and 1 = strong displeasure.
3. The enjoyment scores for illustrative purposes are given twice the weight of monetary profit.
4. The sum of the weighted P/W%'s provide a measure of total B-C where multiple criteria are not all measured on the same scale.

ble. We can then subject the scores to part/whole percentaging in order to convert the raw scores into dimensionless numbers.

Column 8 shows the sum of the weighted part/whole percentages for each case. Each of those sums is arrived at by taking the part/whole percentage for the B-C difference shown in column 5 and adding it to twice the part/whole percentage for the enjoyment score shown in column 7. Those figures in column 8 can be referred to as showing percentage benefits minus percentage costs or %B-%C. One would, however, not want to sequence the cases in the order of the column 8 numbers any more than one would want to sequence the cases in Table 1 in the order of the B-C differences. Sequencing by B-C or %B-%C does not maximize overall benefits minus costs. It does not take into consideration that the case with the highest B-C or %B-%C may also consume a large quantity of hours and inefficiently leave no time for handling other highly profitable cases.

To consider the quantity of hours in sequencing the cases, one needs to divide B-C by hours in Table 1 and divide %B-%C by hours in Table 2. That is done in column 9. It shows that the best order in which to process the cases for the first 40-hour week is Case 12 first, which uses 30 hours. We then have a choice of either Case 2 or Case 11, both of which have a score of 1.60 on (%B-%C)/Hours. Both cases also happen to take 20 hours. One can therefore complete the 40 hours by doing half the 10 hours of work on either Case 2 or Case 11. The result will be 49 plus 16% profit units. There is no other combination of 40 hours that will add to more than those 65% profit units. If, for example, one were to take Case 23 and the next more profitable case, which is Case 6, that would mean 49% profit units plus one third of 34 or 11% profit units for Case 6. The total would then be only 60% profit units, rather than 65.

The analysis in Table 2 enables one to meaningfully combine criteria that are measured in dollars (like the B-C difference) and other relevant criteria that are measured on a different scale (like psychological enjoyment). The arithmetic, however, requires a bit more effort than Table 1 where all the criteria are measured in dollars. Even so, the arithmetic is no more complicated than calculating and adding percentages, rather than raw scores. The arithmetic can be made easier using a microcomputer program called Policy/Goal Percentaging. The user inputs into a microcomputer (along with the program) the predicted benefits and costs for each case and a psychological enjoyment score. The microcomputer then displays information like that shown in Table 2 to enable the user-lawyer or legal

administrator to schedule the cases accordingly. Doing so will result in bringing in the biggest monetary and nonmonetary profits as early as possible so one can invest the money and enjoy the psychological pleasures with many returns thereafter. That would not be possible if those profits and pleasures were needlessly delayed through bad scheduling.

V. ALLOCATING TIME PER CASE

The main purpose of this article is to discuss the optimum sequencing of cases, rather than how much time should be optimally allocated to each case. The time allocating problem is an interesting one, but it has been previously discussed in law reviews, by this author and others, unlike the sequencing problem. Time allocating is also a simpler problem, although one that raises trickier ethical questions.

With the data from Table 1, one can logically say that the optimum time for cases of casetype A is 30 hours; for casetype B, anything between 20 and 30 hours; for casetype C, 20 hours; and for casetype D, 30 hours. Those figures are arrived at by noting which case or time interval gives the most profit. With only three cases per casetype, we do not have a very large sample for generalizing. It would be much better to have a few dozen cases per casetype. We could then arrange the cases in the order of their billable hours, and then observe through simple graphing at what level of billable hours profit tends to be maximized. For most casetypes where there is a relation between hours and benefits received, the profit or B-C difference would go up as more hours are devoted to bringing in more benefits, but then profit would go down as the hours become excessive relative to the diminishing returns. The same reasoning applies to Table 2 where nonmonetary criteria are involved, except that for each casetype, we would pick the level of hours corresponding to the maximum %B-%C, rather than $B-$C.

Ethical problems occur in time allocation because the interests of the lawyer in maximizing the profits of the firm may not be congruent with the interests of clients in maximizing their benefits minus costs. This is contrary to the sequencing situation where the interests do tend to be congruent. Under an hourly rate, a lawyer might have a tendency to work more hours than under a contingency fee or flat fee to the benefit of the lawyer's income, but to the detriment of the client's expenses. Likewise, under a flat fee, the lawyer might have a tendency to work as few hours as possible to reduce the lawyer's expenses thereby benefitting the lawyer. This will be a detriment to the client's possible future award. Even under a contingency fee or a case in which the lawyer gets paid in proportion to the benefits obtained for the client, there may be a conflict of interest,

although they share in the benefits. This is so because only the lawyer bears the expenses for the hours put in, not the client. This could cause lawyers to hold back on additional hours in order to maximize their benefits minus costs which are not the same as the benefits minus costs of the clients. The best remedy for these potential conflicts is probably not stronger ethical guidelines for attorneys, but instead more price and advertising competition among attorneys. Consumers are less likely to be taken advantage of when they can do meaningful comparison shopping among attorneys offering different rates and forms of service.

Sequencing the cases to indicate the order in which they should be processed is clearly different from allocating time to each case. Both forms of time management are different from allocating a fixed amount of resources. Time in one sense is not a scarce resource. Individuals have their lifetime, which usually means about 70 years from birth, 50 years from beginning law practice, and 25 years from the prime of law practice. Thus, if one runs out of time this week, there will be more time available next week. An individual or firm can also hire additional people, thereby acquiring more time for handling incoming cases. Therefore if a lawyer turns down a case for lack of time, it means (1) the case could be processed eventually, but the delay would be too long relative to the statute of limitations or other maximum constraints, (2) the case might never be processed because the lawyer anticipates there will be a continuous inflow of more profitable and more interesting cases such that the case under consideration will always be pushed back, or (3) the case is not worth hiring additional personnel to process.

One should also note that time allocation means allocating time per case not per casetype. For example, suppose one has two casetypes. Suppose also that the first casetype is twice as profitable as the second in the sense that (1) the average case from the first casetype brings in a profit of $20,000, whereas the average case from the second casetype brings in a profit of only $10,000, or (2) the B/C ratio of the first casetype is 8 to 1, whereas the B/C ratio of the second casetype is only 4 to 1. One would not necessarily allocate twice as much time to the first casetype because the amount of time one would allocate to the first and second casetypes would depend partly on how many cases there were of each type. More important, one always allocates time to cases, not to casetypes. One also allocates the amount of time which analysis of that casetype has shown tends to

maximize benefits minus costs, borrowing from next week if necessary.

An important distinction between time allocation to cases and money allocation to activities or places is the fact that case allocation generally involves an optimum level problem, where doing too much or too little is undesirable. Allocating to activities or places, however, generally involves an optimum mix problem, where the object is to allocate the resources to the activities or places in light of their diminishing marginal returns. It thus makes sense to switch some funding from more efficient activities or places to less efficient ones because the marginal or incremental returns from the more efficient places have plateaued out, but the marginal returns from the less efficient places are still substantial. Under those circumstances, one generally wants to allocate to the activities (X_1 and X_2) in proportion to their elasticity coefficients or exponents in equations of the form $Y = a(X_1)^{b1}(X_2)^{b2}$, where Y is a composite goal to be achieved. The activities or places are not so likely to involve diminishing absolute returns where profits go up until they reach a peak and then go down as contrasted to tapering off. This is unlike allocating to cases where the profits do go down as a result of the benefits tapering off while the expenses rise with additional hours or other inputs. This is a more important distinction than saying that more time comes later since in most budgeting problems more money also comes later. Likewise, one can hire or borrow additional money analogous to hiring or borrowing the time of additional people.

V. Some Conclusions

We thus have three kinds of allocation problems covering:

1. Sequencing of cases or activities in order to maximize benefits minus costs for a given time period or to reduce delay.
2. Allocating to cases where doing too much or too little is undesirable, and each case is viewed as a separate optimum level problem.
3. Allocating to activities or places where an optimum mix across the activities or places is needed in order to consider their diminishing marginal returns.

Those three kinds of allocation can be applied to a wide variety of situations in efficiently operating a law firm, a court system, a government agency, or other entities. One point that needs emphasis is that those methods can bring increased monetary and non-monetary benefits minus costs without incurring substantial risks or investment. Normally, to increase one's net benefits or profits, one has to be willing to take chances or spend substantial funds or other resources to obtain the increased net benefits or profits which come from optimum sequencing and optimum time allocating; however, one simply needs to be more systematic in the processing of cases, especially the scheduling of them. It is hoped that this article will con-

tribute to the increased use of those systematic methods for increasing the net benefits of law practice and related activities.[4]

4. For literature on finding an optimum mix in allocating resources across activities or places, *see* C. MCMILLAN, JR., MATHEMATICAL PROGRAMMING: AN INTRODUCTION TO THE DESIGN AND APPLICATION OF OPTIMAL DECISION MACHINES (1970); F. BELTRAMI, MODELS FOR PUBLIC SYSTEMS ANALYSIS (1977); W. KELLY, URBAN SYSTEMS MODELS (1975). *See also* S. NAGEL, POLICY EVALUATION: MAKING OPTIMUM DECISIONS 179-254 (1982).