Improving Productivity in the Courts: A Primer for Clerks of Court

National Institute of Law Enforcement and Criminal Justice
Law Enforcement Assistance Administration
United States Department of Justice

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A Primer for Clerks of Court

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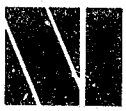

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PREFACE

Improving productivity in the courts is of increasing importance as local government seeks ways of meeting escalating demands for services with limited resources. The purpose of this publication is to help managers and supervisors in the courts understand how the traditional industrial engineering techniques for the measurement and enhancement of productivity may be applied in the courts. The techniques discussed in this publication include those well-developed principles of operations analysis, work measurement, and facilities planning that have been successfully applied in both industry and in other areas of local government for many years.

Check lists for the specific operations of the courts are used extensively, and all examples have been taken from actual court operations.

Modern industrial engineering makes extensive use of mathematical modeling and systems analysis techniques for design and analysis purposes. However, those approaches to productivity improvement whose bases lie in applied mathematics or computer simulation have not been discussed in this book. Nevertheless, sections of the publication are intended to help put into perspective the relative attributes of the systems approach, the use of theory from the behavioral sciences for employee motivation, and the use of computers, as opposed to traditional industrial engineering techniques for productivity improvement.

No prior knowledge of traditional industrial engineering topics is presumed. It is expected that the reader is familiar with the functions and typical operations of the state courts.

ACKNOWLEDGEMENTS

Many persons in local courts throughout the Nation made both direct and indirect contributions to this publication. Although it is impossible to name them all, particular thanks are due to Mr. Paul Dato and the management and staff of the Municipal Court of San Diego for their numerous suggestions. A special acknowledgement is due Mr. Michael Wong whose book, *Space Management in the Courts—A Design Handbook,* served as a basis for portions of the check lists provided in the chapter on facilities planning; and to the Criminal Courts Technical Assistance Project at the American University for making available reports on its extensive consultative assistance in the courts. The editorial assistance of Ms. Vickie Kelly of Del Mar, California, and Ms. Carolyn Burstein of LEAA is gratefully acknowledged along with the valuable suggestions of Mr. Stanley Kalin of the U.S. Department of Labor.

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CHAPTER I. MEASURING AND ENHANCING PRODUCTIVITY IN THE COURTS

As local governments throughout the Nation attempt to meet increased demands for services with limited resources, productivity improvement in the courts becomes increasingly important.

In many jurisdictions it is expected that increasing workloads will be met by improved productivity rather than by increasing staff or building new facilties. New programs must be financed with the gains in manpower provided by improved labor efficiency in existing programs.

Moreover, there is an increasing awareness on the part of both elected officials and the public that improved productivity in the public and private sectors of our economy is necessary for maintaining our Nation's standard of living.

This document is intended to illustrate how certain industrial engineering and management control techniques may be applied in the courts to improve labor efficiency and productivity. The techniques to be discussed are those that are normally associated with the field of industrial engineering and that have found broad application in government and industry for over half a century in the United States. They involve procedures and concepts for improving labor efficiency by careful design of the workplace, by the use of quality control techniques, mechanical labor-saving devices, and through the use of labor productivity reporting.

Productivity improvement in the courts may be approached from a number of viewpoints, and the techniques that are discussed in this document represent only one of these viewpoints. Other approaches include the application of social and behavioral science theories for improving employee motivation, computer automation, as well as the mathematical and analytical concepts associated with systems analysis.

In the last few years, a great deal of emphasis has been placed on the use of systems analysis for improving court operations. While the approach, philosophy, and analytical techniques of systems analysis can be of great value to the court administrator, there remain many situations in which substantial gains in efficiency may be obtained through application of the most elementary management engineering and industrial engineering concepts.

Some of the techniques described below may only be applied by an experienced professional. However, many concepts may be applied by persons without specialized training simply by keeping in mind the concepts involved and by questioning the appropriateness of the work methods that they use.

By and large, the techniques to be described apply to the clerical operations of the court that are performed outside of the courtroom itself.

A. How Is Productivity Defined in the Courts?

Productivity is generally defined as the ratio of the services and products produced by an entity divided by the resources used to produce them, i.e., the output divided by the input. This concept is almost identical to the way we measure the efficiency of an engine. While the idea seems simple, it can also be exceedingly elusive to apply.

The problem lies in the difficulty of being able to define and measure the inputs and the outputs in ways such that, when we divide the two, we have a number that is useful.

For example, when we are speaking of the productivity of the United States, we refer to the quantities of different goods and services produced (the outputs) divided by the hours of labor used to produce these goods or services (the inputs). When we divide output by input, we obtain numbers such as "tons of steel per person-hour," "barrels of petroleum products per person-hour," and so forth. These measures are called productivity indices. While such numbers have great utility in expressing the economic state of affairs for our Nation, they also have limitations. One must be careful in drawing conclusions and basing policy changes on these measures alone.

A similar situation exists in measuring productivity in the courts. For example, if we define the outputs in the courts as "numbers of cases processed" and

the inputs as the labor hours required to process those cases, we obtain, by dividing the two, a number that is expressed in "cases per person-hour." However, unless we have ensured that quality of case processing is maintained, then an increasing "number of cases per person-hour" is not necessarily a valid measure of improvement. Thus, this typical measure of productivity in the courts can be an interesting statistic but may be of limited use for the management and administration of the courts without additional information on the cost and quality of work being performed.

At a lower level in the operation of the court, dividing the number of traffic citations processed by the labor hours required to process the citations (to obtain citations per person-hour) may give us a useful measure of the productivity of a segment of the court's clerical operations, assuming, of course, that we have determined that the quality of work (number of mistakes, lost revenues, etc.) is not reduced as the "citations per person-hour" increases.

If we buy or lease an expensive data processing system to handle the traffic citations, we can probably greatly reduce the number of clerical labor hours needed to process the work. Here a productivity index would show improvement, since the number of traffic citations processed would stay the same and we would divide by fewer labor hours to compute productivity. Thus, our apparent labor productivity is better even though it may cost us more to process traffic citations by computer. In this case, we need to know unit costs in order to measure the change.

A third way of measuring productivity involves dividing the hours it should have taken to produce the work by the actual hours taken. This measure of productivity is called labor efficiency, and is discussed in Chapter III.

It may be thus observed that, while we can construct quite a large number of different measures of productivity in the courts, not all of these will be useful.

The utility of any measure of productivity in the courts will be dependent on the following two factors:

- The extent to which changes in quality of service from the standpoint of the public, the court, or local government are adequately treated by the measure;
- The extent to which all important costs are reflected by the measure; and
- The extent to which calculating the measure serves some useful management purpose.

B. Measures of Cost-Effectiveness

In an attempt to overcome some of the difficulties associated with traditional productivity measures, other concepts have been introduced over the last 15 years. "Cost-effectiveness" is one of these, and refers to an approach in which one first establishes a desired effectiveness level, then measures costs associated with alternative ways of meeting that level. A solution to a problem in the courts that is most "cost-effective" is the solution that simultaneously meets or exceeds the desired level of effectiveness while costing the least.

For example, one court was recently exploring alternative word-processing systems to replace manual typing of minute orders. As a first step, a level of machine capability was established in terms of the speed and flexibility with which the automated system should prepare the orders. Each candidate system was compared to this criteria. If a system failed to meet the criteria, it was eliminated. The objective was to find the system that met all criteria for effectiveness at the minimum cost.

The benefit-cost ratio method of analysis has also been applied in the courts. In this method, the ratio of the benefits to the costs is used as an indicator of the most attractive alternative. A benefit-cost ratio of 1.0 means that the benefits equal the costs. If the ratio is greater than 1.0, the benefits exceed the costs. The objective is to find the system that has the most attractive benefit-cost ratio, and which simultaneously neither requires an excessive investment nor fails to supply minimum levels of benefits. The method is deceptively simple and is widely misapplied in local government because analysts fail to properly treat future benefits and costs and fail to examine the incremental benefits and costs between alternatives. Properly applied, however, the benefit-cost ratio method can be quite useful.

The use of benefit-cost ratios and cost-effectiveness analysis differ from traditional productivity measurement in that they are normally used for the purpose of selecting between alternative system designs, rather than as an ongoing measure of performance. Benefit-cost ratio and cost-effectiveness studies both have a place in the courts. They do not, however, overcome the difficulty of appropriately defining or measuring inputs and outputs, nor do they serve as a substitute for the day-to-day management need to measure and track productivity levels.

Exhibit 1.1. *Some Alternatives for Performance Measurement in a Municipal Court*

Approach	Concept and Example	Advantages	Disadvantages
Labor Efficiency	**Using Engineered Labor Standards.** This system will produce periodic (monthly, weekly, etc.) estimates of labor efficiency. Basic concept is one of "earned hours" divided by "actual hours." The earned hours are obtained by multiplying the units of work produced by standard hours per unit of work. The standards are determined by a detailed analysis of the work methods, machines, layout, delays and all factors which relate to the time needed to perform the work. *For example*, on the basis of standards established for the Key Punch Section, during one month, the actual hours worked were 1352 and the "earned hours" were 944; then Labor Efficiency = 944/1344 = .71 = 71%	Provides the most accurate information regarding labor efficiency since it relates to an objective standard. Also provides best basis for methods improvement.	Does not take into account the $ cost of the overall operation and does not necessarily relate to the effectiveness of the operation.
	Using Historical Data. This is essentially the same as engineered work measurement (above) except that the standards are based on historical averages rather than a detailed analysis of the work methods. *For example*, using the December 1973 data from the Key Punch Group we find that the average time spent in punching a card is 1352 person-hours/117,332 cards = .011 hours/card and we would then use this as a labor standard for calculating earned hours in the following months.	A principal advantage over "engineered work measurement" is that the "standards" may be more readily obtained.	Same disadvantages as above. In addition does not show what is theoretically obtainable.
Unit Costs	The basic concept is one of "dollars spent" divided by "work produced" to give us "dollars/unit of work." *For example*, if during the month of December, 1973, the Traffic Division processed 66,298 citations and total expenses during the month were $105,000, then Unit cost = $105,000/66,298 = $1.58/citation	Principal advantage is that it indicates $ cost of work units.	From unit cost data alone it is difficult to determine what is wrong if unit costs are increasing—labor standards may be needed.
Productivity Indices	The basic concept is one of dividing total output by total input. For example, a productivity index for the Traffic Division could be "total citations processed" per person-month of labor. Then for the month of December we would obtain Productivity index number = citations processed/person-months = 66,928/83.0 = 798 citations/person-month	Provides a good overall measure of the efficiency of the operation.	From productivity indices it is difficult to determine what is wrong if the index falls and what to specifically do about it—again, labor standards may be needed.

Exhibit 1.1. *Some Alternatives for Performance Measurement in a Municipal Court*

Approach	Concept and Example	Advantages	Disadvantages
Effectiveness	The basic concept is to measure on a continuing basis one or more variables that truly indicate the effectivness of the Traffic Division in meeting one or more higher order objectives of the criminal justice system. *For example*, a measure of effectiveness might be "number of cases adjudicated within 30 days"	Provides measure of success in meeting objectives rather than efficiency.	It is difficult to formulate and agree upon measures of effectiveness for specific organizational units within the criminal justice system. Also, meeting the objective may really be outside the control of the unit.

Thus, the court administrator has a variety of approaches and concepts available for analyzing productivity. These include setting up systems to measure workload, effectiveness, unit costs, and labor efficiency; establishing productivity indices; and analyzing procedural and equipment alternatives using the methods of cost-effectiveness and benefit-cost ratios.

In selecting an approach, the court administrator must ask the following questions:

- Is my objective to decide which procedure or piece of equipment is best on a one-time basis, or do I need a continuing measure of performance?
- How much can I afford to spend to measure productivity on a continuing basis? To what extent will the information really be used?
- Do I need to know labor efficiency or unit costs, or will a productivity index suffice?
- Does the overall measurement system adequately treat the quality of work performed as well as efficiency and true cost?

Exhibit 1.2. *Indices of Performance in the Courts*

The effectiveness of court management depends upon the correctness with which decisions are made. Labor efficiency, unit cost, productivity and effectiveness measurements provide the means of quantifying many aspects of court performance needed for making correct management decisions.

These 4 types of measures—labor efficiency, unit cost, productivity and effectiveness—may be developed and integrated into a total measurement system with carefully defined uses for each measure at different levels of supervision and management.

Labor Efficiency.—Is the ratio of the time it should take to do the work under normal conditions to the time it actually took. The time it should take to do the work is calculated from time standards that take into account the procedures that are used and the characteristics of the facility and workplace.

Unit Costs.—Relate the work unit to the costs or resources consumed in producing that unit. Unit costs may include, in addition to personnel costs, the cost of supplies, travel, equipment, etc. Thus, unit costs reflect the ratio of personnel, materials, travel and other costs to the output produced, and will be stated in the dollars required to produce a unit of work. When the dollars are deflated to take account for inflation, they are called constant dollars.

Productivity Indices.—Are the relationships between total output and one or more associated inputs. This is expressed as a ratio of total output to resource input. Measures of input may be based on the amount of manpower alone or on a more comprehensive measure of resource inputs which include non-labor costs.

The ratio of output to input in a base period is compared to the ratio in succeeding periods. This comparison establishes the change in productivity.

Effectiveness Indices.—Are the ratios between achieved result and some end objective or goal. Thus, the output of programs is measured in terms of units of achievement of specified objectives and goals of those programs resulting in a measure of the degree of goal fulfillment.

C. Productivity Improvement vs. The Quality of Justice

Overall, improvements in the operation of our Nation's courts seem to fall into two general categories.

First, there is the question of the quality of justice, focusing on issues such as the protection of rights, improved consistency in sentencing, the reduction in delay in processing criminal defendants and in settling civil cases, and similar concerns.

Second, there are the problems related to the cost-effectiveness and productivity of court operations. In many courts these areas of concern are related in that increased productivity can help provide the resources needed to improve the quality of justice. However, even though the court should express a

genuine concern for productivity, the more fundamental concern must be the quality of justice.

While productivity improvement projects have been successfully conducted in local government for many years, there have been difficulties not encountered in the private, profit-making sector. One important reason for this is the problem of formulating measures of effectiveness that are both technically and politically acceptable.

To date within the courts, no such measures have been agreed to on a broad scale. We do have goals stated in terms such as the time to process a felony defendant, jury idle time, and sentencing consistency. These goals are not interdependent on each other. For example, the time to process a felony defendant may be reduced at the expense of a fair trial, jury idle time may be reduced by procedures that cause delay in conducting the trial, and strict consistency in sentencing may lead to totally inappropriate sentences.

Even though we lack clear, uncontroversial measures of effectiveness in the courts, it is invalid to conclude that productivity cannot readily be measured or improved. The majority of labor costs in the courts are incurred in routine clerical functions, which may be changed with virtually no impact on courtroom proceedings. Labor productivity control systems, automation, and work simplification may be introduced without in any way affecting the quality of justice, the prerogatives of the judiciary, or the rights of the defendant.

It is incorrect to say that the attempts to improve the quality of justice in the courts and attempts to improve court productivity are inherently in opposition to each other.

D. Factors Tending to Inhibit Productivity Improvement in the Courts

As pointed out above, productivity improvement activities may be feared as undermining the quality of justice or the authority and prerogative of the bench. In addition, the courts are part of government and are managed and staffed by elected and appointed officials as well as persons working under civil service regulations within a bureaucracy. At a recent conference on state and local governmental productivity, sponsored by the National Commission on Productivity and Work Quality, elected officials and department managers offered a number of explanations as to why the organizational and political environment of local government is not supportive of productivity improvement efforts.

For the elected official, the problems include short tenure, relatively little productivity improvement experience, and constant fire-fighting demands. For many, the easiest path to reelection is one of minimizing complaints, avoiding risks, satisfying specific constituent needs, and producing immediate visible results. Because of the way governmental services are financed, the public is unable to relate specific costs to specific services, thus clouding accountability for efficiency. The result, many times, is one of emphasis on short-term action, toleration of minimum bureaucratic performance, and a type of cost consciousness that is counter to true productivity improvement.

In the case of department managers and supervisors, other factors appear to inhibit productivity improvement efforts:

- Cost and productivity data that allow comparisons of similar services between jurisdictions are lacking. The result is a tendency to maintain the status quo and assume that the best possible job is being done.
- Salary and status is based on the amount of money or number of persons managed. The result is a tendency to increase staff and budget by exaggerating the need.
- There is, simultaneously, little reward for unusual achievements, but a very high penalty for failure. The result is little experimentation, padding the budget to ensure that all emergencies may be met, and hoarding of resources.
- The use of line-item types of budgets requires exacting accountability of inputs, but requires little accountability for outputs.

These conditions certainly do not exist in all local governments, and many jurisdictions throughout the Nation have executed sophisticated and successful productivity improvement efforts. Nevertheless, these problems are real and an admission of their existence in local government is a necessary step in constructively approaching productivity improvement.

In addition, judicial productivity has been criticized in the press. In certain parts of the Nation this has resulted in a sensitivity by judges to any studies or efforts directed toward the measurement or analysis of court productivity. Of course, there are two fundamentally different issues here. One issue deals with the working hours of judges, and the other concerns the systems and procedures used for processing cases. Nevertheless, where this sensitivity exists it can inhibit efforts to measure and enhance productivity.

E. Factors Tending to Promote Productivity Improvement Efforts in the Courts

While there are many characteristics of local government that are not supportive of productivity improvement, there are currently two trends that favor renewed attention to improved efficiency in the use of labor and facilities. The first of these is a tightening of resources at the local governmental level. This is requiring that increasing workloads be met with improved productivity rather than new staff and facilities, and that new programs be financed with the gains in manpower received from improved labor efficiency.

Second, and of equal importance, there is an increasing awareness on the part of both elected officials and the public of the fact that our Nation's standard of living is linked to our productivity. While the technical economic details of the phenomena may not be broadly understood, the public is aware that inflation and other adverse economic impacts can be mitigated by strong and continuing gains in productivity, and that our collective economic well-being is related to productivity improvement in all sectors of the economy, including local government and the courts.

Fiscal limitations coupled with improved public understanding of their personal stake in governmental productivity improvement make today a particularly receptive period for productivity improvement activities in the courts.

In addition to alternative ways of measuring the performance of the court, the court administrator has a number of approaches available for improving productivity. These approaches are discussed in Chapter II.

CHAPTER II. OVERVIEW OF PRODUCTIVITY IMPROVEMENT TECHNIQUES

While the principal purpose of this publication is to discuss the use of industrial engineering techniques for productivity improvement in the courts, it is important to put these techniques into perspective with other approaches to productivity improvement that are available to the court administrator.

A. The Industrial Engineering Approach

Traditionally, the industrial engineering approach to productivity improvement has involved the following techniques:

1. *Work measurement.* This refers to a group of techniques used for the purpose of establishing an estimate of the amount of time it either will take or should take to perform tasks in the court. This estimate of time is called a labor standard. Labor standards are not an end in themselves; rather, they are used for purposes of comparing the labor costs associated with alternative methods, as the basis for measuring labor efficiency and for scheduling and planning. If one is to improve productivity, it is important that one be able to measure the degree of improvement. Thus, work measurement can play a key role in court management by providing the means by which improvements in labor efficiency can be measured.

Exhibit 2.1 *Work Measurement*

Work measurement can aid supervision in taking the day-to-day steps necessary for improving labor productivity. In the photograph, court supervisors discuss changes in labor efficiency due to scheduling of cashiers.

2. *Work simplification and methods improvement.* This term refers to the process whereby work procedures are modified in order to either reduce the time it takes to perform the task, to improve the quality of work, or to reduce the effort required on the part of the employee. Work simplification and methods improvement in the courts may involve the design and use of mechanical or electronic labor-saving devices, or involve only the rearrangement of the sequence of operations and manual methods used. The principles of work simplification may be applied to forms and other paperwork activities, or the physical arrangement of the work place itself may be improved. The term "work simplification" does *not* mean that work is trivialized.

3. *Facilities layout.* This term refers to procedures for analyzing the efficiency of the way in which court facilities such as offices and file areas are arranged, and for producing more efficient arrangements. There are unique facilities layout problems in the courts, particularly with respect to security and the movement of criminal defendants. However, many of the principles of effective layout useful in clerical environments outside the court are applicable in the courts.

4. *Quality control.* Quality control based on statistical sampling techniques may be used effectively in the courts for determining accuracy of information, the quality and completeness of documents, and the quality of the overall filing system itself. A recognition that the basic concepts of statistical quality control may be used in this fashion is extremely useful in reducing the cost of maintaining acceptable levels of file and document quality. These same concepts may also be used for controlling the quality of services and clerical operations in general.

In addition to techniques such as the above, other approaches to productivity improvement are available to the court administrator. These include the

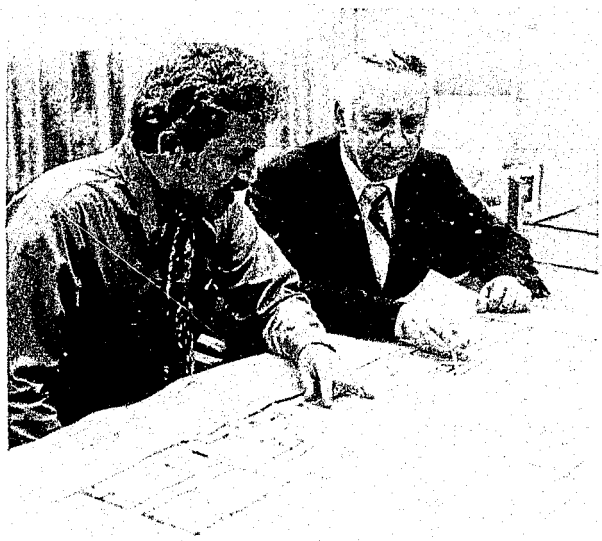


Exhibit 2.2 *Facilities Layout*

The photograph above shows a court administrator and industrial engineer discussing layout changes. While there are unique facilities design problems in the courts due to security and transportation of defendants, more efficient layouts of clerical areas may be achieved by applying well-known, basic analytical techniques.

"systems approach," or systems analysis, the application of theories from the behavioral sciences for improvement of employee motivation, and computer automation. While these approaches or philosophies are by no means mutually exclusive, they do represent different attitudes toward the manner of enhancing productivity in the courts.

B. The Systems Approach

A principal objection to the application of traditional industrial engineering techniques for productivity and efficiency improvement in the courts is that they have a tendency to isolate segments of the overall process. By concentrating on individual processes and operations, there is the danger that improvements in the efficiency of one area of the courts will lead to reduced effectiveness in other areas. It is feared that, overall, this will lead to a net reduction in efficiency rather than a net increase in efficiency.

In order to overcome this potential danger, the "systems approach" requires that careful attention be given to establishing the objectives of the system, agreeing on how to measure overall effectiveness, and that the job of improving productivity be approached from a holistic standpoint. There are no pat formulas for implementing the "systems approach," although many times the approach will involve the construction of a model of the overall process in order to test the effects of alternative policies or procedures. Mathematical techniques are used to analyze the response of the system to proposed changes.

This criticism of the use of traditional industrial engineering techniques in the courts has some merit. It is not difficult to find examples of situations where a reduction in staffing has improved productivity in one segment of the courts, only to result in unacceptable drops in levels of effectiveness or quality in others.

For example, many of the courts' operations have peak loads that are more or less cyclical throughout the year, month, or week, and sometimes even during the day. If we staff to ensure that the peak loads will be disposed of immediately, there will be idle time during the remainder of the period. On the other hand, eliminating the idle time by creating backlogs will ensure that a high level of labor efficiency is obtained, but will result in delays in processing of cases or unacceptable service to the public. For many activities in the courts, there is an inherent tradeoff between labor efficiency and processing delay. The advocates of systems analysis argue, and rightfully so, that many times the optimal staffing level can only be found through the use of systems analysis and operations research techniques.

Over the last ten years, there have been noteworthy applications of operations research and systems analysis in the courts. The types of problems that have been addressed most effectively by these techniques have been in such areas as calendaring, jury management, and witness management, as well as in court-related functions such as the staffing and scheduling of prosecution and defense attorneys, police appearances, and so forth.

The trick is to be able to know when the problem is one that requires the "systems approach" or whether the problem can be isolated and solved through work simplification, work measurement, and similar techniques.

The arguments for the systems approach for productivity improvement in the courts are very strong, and one might be led to conclude that it is the preferred way to proceed in all cases. Unfortunately, the systems approach may be quite expensive, and can become a trackless adventure in applied mathematics and modeling unless the project is managed very carefully.

Exhibit 2.3. *Issues and Problems in the Courts**

	Basic Industrial Engineering Activities			
	Facilities Layout	Work Measurement	Methods Improvement	Quality Control
Lower Courts				
Unify felony and misdemeanor courts	X	X	X	X
Increase judicial manpower and modernize physical facilities	X	X		
Provide prosecutors, defense counsel, and probation officers in courts now lacking them			X	
Abolish or overhaul state Justice of the Peace and U.S. Commissioner systems			X	
Initial Stages of a Criminal Case				
Establish bail projects			X	
Establish station house release and summons procedures			X	
Improve decisions on which defendants should and which should not be charged			X	
Develop and share dispositional information early in case			X	
Sentencing Policies and Procedures				
Establish probation services in all courts for presentence		X	X	
Institute procedures to promote just, uniform sentencing				X
Officers of Justice				
Coordinate local prosecutors through state attorneys general and prosecutors' councils			X	X
Extend early provision of counsel for indigents			X	
Institute state-financed, coordinated assigned counsel or defender systems			X	
Court Scheduling, Management, and Organization				
Create single, unified state court systems	X	X	X	X
Centralize administrative responsibility		X	X	X
Institute timetable for completion of criminal cases				X
Improve facilities, compensation for witnesses and jurors	X			
Improve productivity of operations	X	X	X	X

* This table illustrates the association between some typical industrial engineering activities and current general problems and issues in the court. While not all problems and issues may be addressed by these techniques, there are many instances in which their application will be of assistance to the court administrator.

C. Behavioral Science

For many years behavioral scientists have argued that the traditional management approach to productivity improvement was inherently defective in that it created environments that discouraged rather than encouraged productive activity on the part of employees. This was because it addressed the mechanistic rather than humanistic components of work. Employee motivation, they argue, is the key to productivity improvement.

Since work simplification techniques appear to ignore human needs for motivation, they have the potential for discouraging improvement in efficiency rather than improving it. A prime example lies in the area of job simplification. A clerical job in the courts may be "simplified" by breaking it into separate tasks and assigning each task to a different person. Theoretically, it can be shown that by doing this, greater levels of production will be achieved and there will be greater control over quality. It has been demonstrated repeatedly that this is not necessarily so. Methods changes may reduce the emotional or intellectual reward of the job.

Many behavioral scientists argue that job enlargement, not work simplification, is the key to improved quality and efficiency. The term job enlargement refers to changing work methods so as to improve feelings of achievement, recognition, responsiblity, and personal growth.

However, job enlargement is not accomplished by taking an unrewarding job and adding more unrewarding elements to it. That is, it is not possible to make a satisfying job out of an unsatisfying one simply by adding additional unsatisfying tasks. While a discussion of the principles of job enlargement and employee motivation lie outside the scope of this publication, it is important for the court administrator to keep one thing in mind. Improving the efficiency by changing the work methods will not, in itself, make the job more or less rewarding. Efficient work

methods are not in opposition to either job enlargement or other concepts for employee motivation.

In recent years, there have been many successful applications of behavorial science theories in clerical work environments, and there is much to be learned from them for use in the courts. The courts, however, are not unique from other clerical work settings when it comes to applying these principles. The successful manager realizes that work simplification techniques will not result in improved productivity if they are allowed to trivialize the work of employees or create environments that are unrewarding to the employee.

D. Computer Automation

In many local governments, there is a strong belief that computer automation is the solution to all efficiency problems in the courts. There are two reasons for this: First, computers lend an aura of sophistication to court clerical procedures, which may be perceived as conservative and old-fashioned whether they are or not simply because they are in the courts; second, in many jurisdictions the only "systems and procedures" specialists are the systems analysts employed in the automatic data processing department, who may have a tendency to view all methods improvements in terms of computer automation.

The fantasy exists in many jurisdictions that the only way to improve clerical efficiency is to automate. This is not true, and it is important to approach productivity improvement from the standpoint that computer automation is only one of the alternatives.

E. Which Approach Is Best?

Thus, the court administrator has a variety of techniques and philosophical approaches at his disposal for productivity improvement. Unfortunately, there is no simple answer as to where and when each approach or technique should be used. The answer is, in part, dependent on the style of the manager as well as on the resources and skills that are available to the court.

While the systems approach is compelling, it is sometimes an unnecessarily expensive way to proceed and may lead to findings that lack the sufficient specificity to be implemented. The application of some theories from behavioral science require a high level of sophistication on the part of management. Computer automation will continue to play a key role in the improvement of productivity in the courts, but is not the appropriate way to approach all efficiency problems in the courts. The traditional techniques of industrial engineering, such as work measurement, work simplification, and facilities analysis, are appropriate in many cases but can lead to suboptimization if the interdependencies between processes in the courts are ignored.

Exhibit 2.4 provides a synopsis of some typical symptoms of problems in the courts, and provides suggestions as to which approach or technique might be the way to proceed. There could be many factors that would change the approach suggested, but the chart serves to illustrate typical problems and the approaches that might be first considered for their solution.

The court administrator who is interested in productivity improvement must be sensitive to opportunties to use all of these approaches and techniques.

Exhibit 2.4. *Suggested Approaches to Problem Solving in the Courts* *

Symptom or Problem	Approach		
	Behavioral	Systems Analysis/ Operations Research	Traditional Industrial Engineering
Excessive turnover	X		
Excessive absenteeism	X		
Apparent carelessness in all phases of docket preparation	X		
Poor relations with the public	X		
Excessive backlog of cases		X	
Delays due to attorney scheduling		X	
Analyzing the effect of alternative case continuance policies		X	
Apparent inefficient use of jurors		X	
Excessive waiting lines at public counters		X	
Congestion in docket file area			X
Misfiled documents			X
Idle time among cashiers			X
Repeated sorting of same form			X
Excessive time spent walking from one area to another			X
Repeated misfiling of a particular form			X
Large variance in the time to perform a task between employees			X
Difficulty in scheduling work			X
Some employees overloaded while other do not have enough to do			X

* This table contrasts several approaches for problem solving and productivity in the courts in terms of the problem to be solved or symptoms observed.

CHAPTER III. WORK MEASUREMENT AND PRODUCTIVITY REPORTING

In virtually all organizations there is a need for estimates of the labor hours needed to perform the various functions of the organization. These time estimates are used for forecasting personnel needs and scheduling work, and can be used in a variety of ways for improving productivity.

In the courts the question is not whether some form of job time estimates are needed. All courts have and use estimates, in one form or another, of the labor hours to complete tasks. Rather, the questions are: How does one obtain these standards? What should be the accuracy and other characteristics of the standards? How can one best use this information for productivity improvement?

The field of work measurement, at first glance, may be confusing to court administrators because of the jargon that is used and the variety and complexity of techniques that seem to be available. Much of this confusion is eliminated once it is recognized that there are only a few fundamentally different approaches, and that their purpose is simply to provide an estimate of the amount of time it will take, or should take, to perform some element of work. This estimate of time is called a *labor standard*.

The selection of the most appropriate work measurement technique is almost always dependent on the careful consideration of one question: How will the labor standards be used?

The following are some examples of how labor standards can be utilized in the courts:

- To help decide between the purchase of alternative pieces of equipment, such as document filing equipment and accounting machines.
- To estimate the personnel needed to meet future workloads.
- To help supervisors in various sections of the court in making day-to-day work assignments so that the possibility of some individuals becoming overloaded and others underloaded is minimized.
- To produce weekly or monthly management reports showing the overall efficiency with which labor is being used, and thus help improve its utilization.

In industry there are some other uses for labor standards, such as determining the amount of money paid to an employee based on that indivdual's product output. These systems, sometimes called *piece rate* systems, normally will not be found in the courts, although interest in the use of various nonmonetary employee incentive plans is growing in local government.

While there are literally hundreds of variations on the techniques for establishing a labor standard, all of them can be seen as a variation of the few techniques described below. If you understand the differences between these basic techniques, you will be better prepared to evaluate proposed methods for establishing labor standards.

A. Time Study

Time study has been extensively used in the United States for over half a century and, when performed by experienced analysts, can provide an extremely accurate estimate of the time needed to perform a work task. In time study, the analyst uses a stop watch, an electronic timer, or other time-measuring devices to record the time that an employee actually spends in performing a task. After a number of observations are made, the analyst averages these observations to produce what is called the *selected time*.

Next, the analyst adjusts the selected time to take into account the particular pace at which the employee was performing the job while being observed. The purpose of this adjustment is to produce what is called the *normal time*. For example, if the analyst perceived the employee as working at a pace faster than that which would be considered normal, he will make an adjustment that increases selected time. If he perceives the employee as working slower than normal, he will lower the selected time. The process of either raising or lowering the selected time to take into account the perceived pace of the employee is

Exhibit 3.1 *Time Study*

In time study, the analyst directly observes the work being performed, and records the time taken using a stopwatch or electronic time recording device. While time standards for most court operatons can be produced using methods other than time study, this traditional technique is occasionally useful.

called *leveling* or *performance rating*, and is a skill that requires both training and experience.

After the selected time is adjusted to reflect the pace that was observed, it is called the *normal time*, which means that it is the time that an employee should take to do the job under normal conditions with normal effort. Lastly, the analyst adjusts the normal time to take into account delays, fatigue, and personal needs of the employee. This adjustment transforms the normal time to what is called the *standard time* or the *labor standard*.

Thus, in performing a time study the analyst goes through several steps. First, he observes the work being performed and, by averaging the observed times, calculates a selected time. Next, the selected time is adjusted to reflect the pace of the employee being observed, and this adjustment leads to what is called the normal time. Lastly, allowances are calculated for fatigue, personal needs of the employee, and delays, to obtain the standard time. The standard time is therefore the time that the operation is expected to take if performed by an employee working at a normal pace and with full consideration given to delays, fatigue, and personal needs. The standard time is normally expressed in "hours/unit of work." For example, .05 hours per warrant would mean that 20 warrants would be prepared in one hour.

The following is a brief description of what an analyst using time study would do in the records section of a court, if he were asked to estimate the time required to check for any outstanding warrants before processing payment of a traffic infraction.

Let us assume that the following steps are involved in performing the operation. The clerk first consults a listing of outstanding warrants, in alphabetical order by defendant's last name.

If the name appears, the clerk writes down the warrant number, rises from the desk, walks to a file of copies of the outstanding warrants, pulls the warrant, and returns to the original desk where subsequent operations such as increasing the amount of bail are then performed.

The analyst must first ensure that an accurate description is obtained of the work to be performed. A sketch of the work place, the types of documents involved, their location, how far the clerk must walk, and other items of this nature are recorded. There are two reasons for this procedure. First, it ensures that the analyst has a detailed knowledge of the nature of the task. Second, it provides a record that may be used for checking the validity of the labor standard in the future.

If, say, a year from now one element of the job has changed—perhaps as the result of a method improvement that eliminated the need to walk to the outstanding warrant file—then another analyst could make an adjustment in the standard without having to duplicate the entire time study.

The ability to update is particularly important where the labor standard is used to provide a continuing measure of labor efficiency. Updating can only be inexpensively accomplished if the layout of the workplace and the method of accomplishing work are accurately recorded.

One important advantage of time study in routine clerical jobs is that if there are any glaring inefficiencies or problems with the layout of the work area or method of performing the work, they will normally be corrected by the analyst before doing the time study. This does not mean that the optimal method must be established, but simply that a reasonably efficient

method of accomplishing the work must exist prior to starting the study. In many cases an experienced time study analyst will be able to quickly point out these problems and, with the cooperation of the worker and supervisor, correct them on the spot before continuing. In other cases it may be impossible to immediately change the work method, but the method is still correctable by relatively simple means such as cleaning up the work station, making documents more accessible by providing a file tray, and so forth. In these cases the analyst would normally wait until the method changes had been made before continuing the time study.

1. *Observed times.* Having determined the elements of the job to be timed and having recorded the methods to be used, the analyst would then proceed by actually obtaining time readings on the clerk performing the job. Let us suppose that the job in our example is divided into two elements by the analyst. The first element involves checking the index file, using the defendant's last name for reference, to see if an outstanding warrant is listed. The second element entails walking to the outstanding warrant file, obtaining the warrant, and returning. Using a stopwatch or electronic recorder, the analyst will record the point in time at which each of these elements begins and ends. By dividing the job into elements, the analyst may more efficiently conduct the time study since certain elements may only occur once in a while. In certain cases, the time to perform each element may be recorded at different times during the day or week in order to obtain a representative sample. These times are called the *observed times.*

There are many factors that will cause individual observed times to vary from one another. For example, the clerk may be interrupted by another employee or by the phone. Another cause of variance in the time may occur when the index shows that there is an outstanding warrant, but none can be found in the outstanding warrant file. In addition, there may be congestion at the outstanding warrant file, which causes the clerk to wait. The clerk must occasionally stop to obtain supplies, remove processed work from the desk, and a multitude of other tasks. The analyst must either include these delays or deviations from the standard procedure in his observed time, or exclude them from the observed time and then include them in an *allowance* to be described below. In one way or another, all legitimate delays or deviations from the standard procedure must be accounted for by the analyst before he completes his study.

2. *The selected time.* Having obtained the observed times, the analyst next calculates what is called the *selected time.* The selected time is normally the arithmetic average of the observed times. For example, suppose the analyst made a number of observations of the warrant-checking procedure, and determined that the average of these observations for the first element of the job was 0.50 minutes (30 seconds). Thus, 0.50 minutes is the selected time resulting from the time study.

3. *Leveling or performance rating.* The next step in the time study is to adjust the selected time to take into account the pace at which the clerk being observed was working, in relation to what is considered the normal pace at which the task could be performed. This procedure is called *leveling,* or *performance rating,* and is one of the more difficult steps in properly performing a time study. While there are a number of systematic techniques for performance rating, in every approach the analyst is essentially comparing the performance of the observed clerk against a hypothetical clerk who is well-qualified, trained, and working under conditions such as temperature, noise, and so forth, which are conducive to good performance. Over the years, various benchmarks of what a 100% performance is have been established. Some of these have been converted to training films, which are used to train analysts in performance rating and to periodically ensure that the analysts' concept of normal is maintained. While performance rating is far from scientific and a fully satisfactory method of defining normal performance has yet to be formulated, the fact remains that a group of well-trained and experienced time study analysts will show a high degree of consistency—both among themselves and over time—in their performance rating of persons executing the types of tasks that exist in the courts.

4. *The normal time.* The analyst will express his performance-rating factor as a percentage, where 100% means that the analyst perceives the clerk as working at a normal pace. A rating of 90% would mean that the clerk was perceived to be working at 90% of normal, or slower than normal, while 110% would mean that the clerk was perceived as working faster than normal. In order to adjust the selected time described above, the analyst simply multiplies the selected time by the performance-rating factor.

For example, if the analyst came up with a performance-rating factor of 90% for the clerk doing the warrant-checking job, then he would multiply the selected time, 0.50 minutes, by the rating factor of 0.90, i.e., $0.50 \times 0.90 = 0.45$ minutes. The 0.45

minutes is called the *normal time* for the operation. Note that in this example, the normal time is less than the selected time. The reason for this is that the analyst perceived the clerk as working at slower than normal, and the selected time must therefore be *reduced* to portray the time that a normal worker would take to do the job. If, on the other hand, the analyst had rated the clerk at 110%, then the normal time would have been 0.50 minutes × 1.10 = 0.55 minutes. In this case, the normal time would be greater than the selected time, since the observed worker was perceived to be working faster than normal and a normal worker would require more time to do the job.

5. *Allowances.* The last step in the time study is to adjust the normal time by taking into account allowances for fatigue, personal time, and delays. The determination of personal allowances is based in part on time provided the employee for such things as coffee breaks, visiting the rest rooms, and so forth. Fatigue allowances are established with consideration given to the stress and effort required to perform the task over extended periods of time. Delay allowances are established by taking into consideration factors such as interruptions to answer questions, extra time to solve problems such as a warrant not being in the warrant file when it was needed, time to dispose of finished work, time to obtain new supplies, and so forth.

Normally, these allowances will be expressed as a percentage of the normal time. For example, suppose the analyst determined that a 5% personal allowance, a 20% delay allowance, and a 7% fatigue allowance should be applied to the normal time. The analyst would then perform the following calculation:

$$\text{Standard Time} = \frac{\text{normal time} \times (1.00 + \text{fatigue allowance})}{(1.00 - \text{personal \& delay allowances})}$$

That is, the normal time would be multiplied by 1.00 plus the fatigue allowance while dividing it by 1.00 less the personal and delay allowances.

Assuming the allowances given above, a selected time of 0.50 minutes, and a performance-rating factor of 90%, the analyst would calculate the standard time as follows:

$$\text{Standard Time} \frac{(.50 \times .90) \times (1.00 + .07)}{1.00 - (.05 + .20)}$$

$$= \frac{.45 \times 1.07}{.75} = .64 \text{ minutes}$$

The standard time is thus the analyst's estimate of the amount of time that should be required to perform the task, given that it is being performed at a normal pace and after allowances for personal needs of the worker, fatigue, delays, and interruptions have been taken into account.

There are both advantages and disadvantages to the use of time study for estabishing labor standards in the courts. A major disadvantage is that it is necessary for the analyst to observe people at work—making use of a stopwatch or similar device—and, in turn, be observed by them. Some employees may feel threatened or irritated by this process. Secondly, an analyst using time study must be well-trained, and he must work fairly regularly at this task in order to maintain the skills necessary for judging the pace of the observed employee and for properly establishing allowances. While time study may be replaced by the techniques described below, it is still useful in certain situations in the courts. These situations include those instances where the employee is operating a machine or has to wait for something to happen during the course of the task being performed.

When a time study is performed in the courts, it is extremely important that all employees have been carefully briefed on the purpose and procedure of the study. Without these preparations, the appearance of a person with a stopwatch can be highly disruptive.

It will be clear to the reader that, with the exception of improvements in work procedures made prior to taking the time study, the standard time arrived at by time study has no utility in itself. It must be used for something. Before discussing how

Exhibit 3.2. *Steps in Performing a Time Study in the Courts*

Step 1.	Make sure that obvious inefficiencies in the way the work is being performed are corrected. If corrections cannot be made on the spot, then wait until they can be made before continuing.
Step 2.	Document the nature of the task along with a description of the workplace and the procedure used to perform the work.
Step 3.	Observe the performance of the task, taking time readings to obtain the *observed times.*
Step 4.	Average the *observed time* readings to obtain the *selected time.*
Step 5.	Adjust the *selected* time to take into account the pace at which the employee was perceived to be working. This gives the *normal time.*
Step 6.	Adjust the normal time to take into account delays, fatigue, and personal needs of the employee. After these adjustments, the normal time is called the *standard time.*

the standard time is used in the courts, we will briefly describe several other techniques for arriving at a labor standard that can be used in the courts but do not involve the same degree of training or experience on the part of the analyst. These are the use of standard data, work sampling, data from accounting records, and data generated by the employees themselves.

B. Standard Data

Over the last 30 years in the United States and other countries, a number of systems of so-called *standard data* have been developed. These systems were developed because of the recognition that it should not be necessary to repeat time studies on the same type of operation every time it occurs. For example, the simple actions of rising from a desk, walking 25 feet to a file cabinet, removing a file folder, and returning to one's desk should take approximately the same amount of time whether they occur in a municipal court, a superior court, or in a bank office down the street.

If one had access to a book that listed a large variety of elemental, clerical tasks along with the time to perform them under normal conditions, then one could simply look up the elements along with their normal times, and add them together in order to obtain a normal time for the overall operation. This is exactly what has been done, and there are a number of systems of standard data available that describe the bulk of clerical operations in the courts.

Standard data systems are roughly classified into two categories. The difference between these categories lies in the length of time it takes to perform the task that is being described. At one extreme we have what are called *predetermined motion time systems*. These systems describe very minute motions such as reaching a short distance, grasping an object, positioning one object against another, and so forth. Motions have been described at this minute level so that they can be used as building blocks to construct more complex series of motions. They are called micromotion time systems because they involve very small (micro) elements of work, and because the amount of time for the motions is quite small—being measured in fractions of a second. By using these systems, it is possible to build up a normal time for almost any complex clerical task. Since building up long series of micromotions can be a laborious and time-consuming task, computer programs have been developed to assist the analyst.

The second category of standard data contains larger elements. A typical element would be "to remove a file folder from a file cabinet" or "to initial a form." This type of standard data was constructed using either time study or the predetermined motion time system as its basis.

As the motion sequence becomes longer and longer, we reduce the probability that it will apply to the exact situation we are trying to analyze. Therefore, the selection of a standard data system must be based on the ability of the standard data elements to accurately describe what we are trying to analyze. At one extreme, we can use micromotion data to do the job, but it may entail a lot of time or work. At the other extreme, the series of motions as well as distances that have been defined may not fit the work situation with which we are dealing.

Fortunately for the clerical operations encountered in the courts, good systems of standard data exist and are at a level that allows them to be readily applied.

Also, it is important to keep in mind that the time values in standard data systems are normal times, and it is therefore not necessary to performance rate an employee. Indeed, it is not even necessary to observe people working if we have a description of the nature of the work. It is necessary, however, to estimate allowances for delays, fatigue, and personal needs in order to calculate the final standard time.

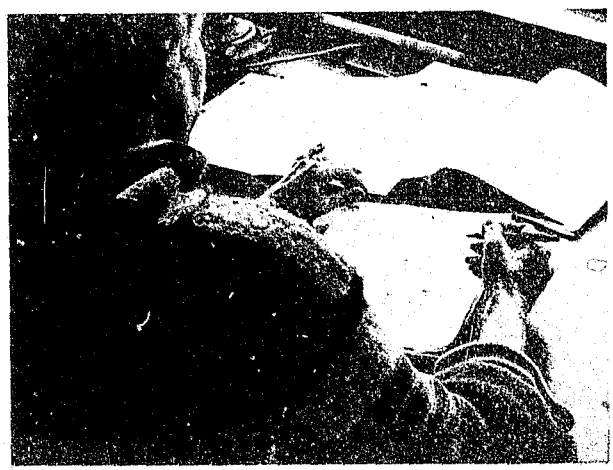


Exhibit 3.3 *Standard Data Analyst*

The photograph above shows an analyst preparing a time standard using standard data. In this technique of work measurement, predetermined normal times for small segments of the job are added together to produce the standard. One advantage of using standard data is that it is not necessary for the analyst to take repeated observations of employee activities. It is only necessary to have a description of the work being performed.

C. Work Sampling

Work sampling is a work measurement technique that has been widely applied in clerical organizations with good results for over 15 years. It is a very flexible tool that may be used not only for setting labor standards in the courts but also for determining idle time, waiting time, and other information that is useful in evaluating the efficiency of many processes in the courts.

Compared to other techniques discussed earlier in this chapter, work sampling requires less skill and training on the part of the analyst who is making the

Exhibit 3.4. *Standard Data Application Sheet**

REFERENCE: T-5
SHEET: 1 OF 1
DEPT: Muni Court, Traffic
DATE: 3-1-74
ANALYST: D. R. Johnson

OPERATION: Check moving violations prior to register

STARTS: Seated at work station
INCLUDES: Getting batch of material, unbanding and unclipping, examining the citation and check or money order for correctness, asiding questionable items
ENDS: Seated at work station

No.	Description	Reference	Element Time	Freq.	Total
1.	Stand, walk, return, sit	BOD-TO-01	172 + 17V	1/20	21.35
2.	Get batch of material	GM 2	25.0	1/20	1.25
3.	Remove rubber bands	FAS-BR-01	15.0	1.5/20	1.25
4.	Aside batch	GBT	49.0	1/20	2.45
5.	Get individual case	GSH	39.0	1	39.0
6.	Scan material	TRD-LS-CC	80.0	1	80.0
7.	Check violation	ED	22.0	1	22.0
8.	Check date	ED	22.0	1	22.0
9.	Check instrument amount (print)	ED	22.0	1	22.0
10.	Check instrument date	ED	22.0	1	22.0
11.	Check instrument amount (written)	ED	22.0	1	22.0
12.	Check signature	RDS	7	13.32	93.24
13.	Scan courtesy notice	TRD-LS-CC	80.0	1	80.0
14.	Reclip set	FAS-CA-03	29.0	1	29.0
15.	Aside set	GBP	66.0	1	66.0
16.	Get batch	GB	29.0	1/20	1.45
17.	Jog batch	HJS	8.0	5/20	2.0
18.	Reband batch	FAS-BB-02	60.0	1/20	3.0
19.	Aside batch	GP1	37.0	1/20	1.85
				Total—TMU	531.715
				DHU	.0001

* This form illustrates the way standard data is used to develop a labor standard in the courts. Each step in processing a batch of traffic citations is listed in the left-hand column. The right-hand columns reference the standard data element used, its time value, the frequency with which the element occurs in the overall operation, and the final time for the step. The time values shown in the right-hand column are not in seconds but in a special unit of time called a Time Motion Unit (TMO).

Exhibit 3.5. *Steps in Using Standard Data for Establishing Labor Standards in the Courts*

Step 1. Correct any obvious inefficiencies in the way the work is being performed and document the way the job is performed.

Step 2. Break the job down into small elements of work which correspond to the elemental tasks described in the standard data system being used.

Step 3. Using the standard data time elements, calculate the normal time for the operation by adding up the time values for each element.

Step 4. Adjust the normal time obtained in Step 3 to account for fatigue, personal needs, and delays to obtain the standard time.

observations. Care must be taken, however, in setting up and planning the studies.

A short example is perhaps the best way to describe what is done in a work sampling study. Suppose that we wanted to estimate the amount of time that a group of five clerks in the court calendar division spend responding to telephone inquiries. One way to approach the problem would be to make a fairly large number of instantaneous, snapshot-like observations of the clerks' activities at random points in time over, say, a two-week period. Each time we made an observation we would note what the clerk was doing. In other words, we would be sampling the work activity by momentary observations. The term "work sampling" is derived from this idea.

Now suppose that at the end of the two-week period we had made 200 momentary observations of each of the five clerks for a total of 1000 observations; and suppose that, among these 1000 observations, 100 instances were found where the clerk was responding to a telephone inquiry. We would then conclude that approximately 10% of the clerk's time was spent in responding to telephone inquiries, since 100 observations is 10% of the total 1000 observations that were made.

This information in itself may be useful in gaining a better understanding of how to improve the efficiency of the operation. However, we can also use it to develop a labor standard for handling telephone inquiries if it is known how many telephone calls have been handled.

Continuing with our example, suppose we found that 300 telephone calls were handled during the two-week period of the observations. How would the estimate of time per call be made?

Assuming that each clerk worked 8 hours per day, or 40 hours per week, then each clerk would have worked 80 hours over the two-week period of the observations. Five clerks, therefore, would have put in $5 \times 80 = 400$ person hours over the period of the observations. Since we previously estimated that 10% of the clerk's time was spent in responding to telephone inquiries, we would now estimate that 10% of 400 hours = 40 hours were spent by all five clerks in handling telephone inquiries. Forty hours is equivalent to 2400 minutes, i.e., 40 hours $\times$ 60 minutes per hour = 2400 minutes. Since there were 300 telephone inquiries handled during this period, then the average time per telephone inquiry would be $2400 \div 300 = 8$ minutes per telephone inquiry.

It is conceivable that there would be several ways in which we could find out how many telephone inquiries had been handled over the two-week observation period. One way would be to request that the clerks place a piece of paper next to the phone and make a simple check mark each time they handled a telephone inquiry. On the other hand, if the telephone inquiry resulted in the clerk making an entry on a log or otherwise generating a piece of paper, we could then count the entries on the log or count the number of pieces of paper generated to estimate the number of telephone inquiries made. In any event, it is almost certain that we could establish an efficient system for obtaining a reliable estimate

Exhibit 3.6 *Work Sampling Analyst*

Work sampling is a technique of work measurement that is particularly useful in the courts. In work sampling studies, the analyst makes a large number of instantaneous observations of the work being performed. These observations are then used to accurately estimate the percentage of total time spent on various tasks as well as idle time.

of the number of telephone inquiries handled, while placing a minimal burden on the clerk, if any burden at all.

The accuracy of our estimate of 8 minutes per call is dependent on a number of factors. First, did we take our observations during a period of time that is representative of the clerk's normal workload, and in such a way that we did not bias the results? For example, if all the observations were taken early in the morning of each day, it is likely that we would not have accurately estimated the proportion of time spent responding to telephone inquiries. Second, did we take enough observations to ensure that the sample was accurate? Inaccuracies could result from our assuming that the clerk was responding to an official telephone inquiry when, in fact, the time spent on the telephone was for intraoffice business or even personal business. Lastly, there could be errors in the way we estimated the total person-hours actually expended by the five clerks. These errors could be caused by absenteeism or by a clerk being assigned to a special task not related to the normal work of the group. Also, there could be errors in the way we counted the number of telephone inquiries.

From among these possible sources of error, the number of total observations needed to ensure a desired level of accuracy can be easily checked. The statistical properties of the estimates are known mathematically and may be readily verified by simple equations or by tables that have been prepared especially for this purpose. All other sources of error, including whether or not the period of the study is representative, must be minimized by careful design of the work sampling study.

As mentioned above, one of the advantages of using work sampling is that it requires less skill and training for an analyst to successfully collect the data once the study has been planned. A variation of the approach described above requires that the analyst also rate the performance of the persons being observed in order to arrive at a normal time in much the same manner as was described in time study. Performance rating in work sampling studies, as in time study, requires training and experience.

The reduced skill and experience on the part of the analyst is not the major advantage, however, to work sampling. The advantage lies in the ability to simultaneously collect information on a large number of tasks in the courts. To understand how this could work, note that in the above example it was implied that we were only observing whether or not the clerks were responding to telephone inquiries. Clearly, we could have been recording additional activities performed by the five clerks, as well as activities performed by as many as 100 other clerks working in different departments on several hundred work tasks.

For example, a work sampling study done in a Southern California municipal court simultaneously involved 60 employees and over 200 separate work tasks. At the end of this study, information was available on the amount of time need to perform each of these 200 tasks. This information was collected much more economically than would have been possible with either time study or the use of standard data.

Where there is idle time due to waiting for material or people, or where the clerk is simultaneously performing a number of work tasks with many interruptions, work sampling may be the most effective way to develop time standards for the work. While work sampling is one of the most appealing ways to approach the development of labor standards in the courts, it is not without disadvantages. One disadvantage is that the analyst, in making observations of people working, is also observed by them. Unless the purpose of the study is clearly explained, the presence of the analyst may be disruptive.

The second problem is that, by using the method described above, we do not necessarily obtain the normal time to perform the task unless performance

Exhibit 3.7. *Steps in Conducting a Work Sampling Study in the Courts*

Step 1.	Identify the types of activities for which time estimates are desired. These may include idle time, time spent waiting for information, and elements of operations.
Step 2.	Establish a method for accumulating the total labor hours spent on the activities being observed, e.g., by auditing time cards.
Step 3.	Establish a method for obtaining a count of the amount of work produced.
Step 4.	Set up a schedule for making instantaneous observations of the activities of the persons being studied.
Step 5.	Make observations until the desired level of statistical precision and confidence has been achieved.
Step 6.	Calculate the percentage of observations made for each activity identified in Step 1.
Step 7.	Using the percentage arrived at in Step 6, calculate the labor hours associated with the activity using the total accumulated labor hours obtained from Step 2.
Step 8.	Estimate the time per unit of work produced using the hours spent on the activity, calculated in Step 7, and the amount of work produced, obtained from Step 3.

rating is incorporated. Even with these disadvantages, work sampling is one of the most attractive ways to establish labor standards in the courts.

D. Self-Administered Time Study or Work Sampling Study

In the description of work sampling study given above, it was assumed that the observations were made by an analyst. The observations may be made, however, by the employees themselves.

For example, the five clerks described above could be requested to make a check mark on a list of their various activities at 10 minute intervals during the day. At the end of the two-week period these lists would be collected and the proportion of time spent on each type of activity calculated.

These types of self-administered time studies have been successfully undertaken in several states to develop caseload standards for the judiciary as well as for clerical personnel in the courts. In these studies care must be taken to achieve two important results. First, the possible variations of the work to be performed must be carefully analyzed and described in an unambiguous manner prior to the study, so that the employee can easily locate and check the correct activity on the list. Second, as with work sampling, a method of counting the work output must be obtained and the time data collected must correspond to the work output data collected.

Self-administered time studies or work sampling studies can be combined with observations by a trained analyst for performance rating and for checking the validity of data. There is a very large number of variants on this approach.

E. Use of Historical Data

By far the most common method of estimating task performance time in local government and in the courts is by the use of what is called *historical data*, or accounting data. The procedure is very simple.

From the accounting records, one can estimate the person-hours spent on particular tasks. By using workload reports, one next estimates the amount of work performed, and by dividing the two, one obtains an estimate of the time to perform a task.

For example, assume that during the calendar year of 1976 in the traffic division of a municipal court, 75,000 traffic citations were processed. During the same year payroll records showed that 100,000 person-hours of clerical time were required to process this work. One would then estimate that the time to process a traffic citation was on the order of 100,000 hours ÷ 75,000 citations = 1.3 hours per citation.

The advantage of using historical data is that it neither requires the presence of an analyst to observe the employees nor requires that the employees record their activities. On the other hand, it does not tell us much about the normal time, and it can give us little insight for the purposes of improving productivity.

Exhibit 3.8. *Clerical Labor Standards Developed Using Self-Administered Time Studies*

Court: SUPERIOR

Type Proceeding: JUVENILE DELINQUENCY AND DEPENDENCY

Activity Description	Average Time (Min/Action)	Frequency (Actions/Filing)	Weight
Case initiation, document acceptance and counter activities (per initial petition)	34.4	1.0000	34.4
Preparation of finished minutes, court orders, judgments and warrants (per document prepared)	8.6	8.8140	75.8
Recordkeeping, case file and register of actions maintenance (per court appearance)	60.6	1.6274	98.6
Notification of court actions (per notice)	15.9	0.3270	5.2
Calendaring activities (per setting)	11.7	2.8753	33.6
Courtroom activities (per court appearance)	40.6	1.6274	66.1
Subtotal			**313.7**
Direct supervision			14.9
Total Filing Weight (minutes per filing)			**328.6**

The table above summarizes the results of a self-administered time study in the Los Angeles Superior Court. The basic data was obtained by employees of the court checking off on a list their particular activities throughout the day. The total minutes per filing is obtained by adding up the minutes for each type of action involved in processing the case. The time for each action is obtained by multiplying the average minutes per action by the number of times the action occurs during the course of processing the case.

Nevertheless, time standards based on historical data present an immediate opportunity for measuring gross changes in court productivity. The procedure is easily explained to persons outside of the court system, as well as understood by court employees.

F. Multiple Regression Analysis

In cases where historical data, accounting data, self-administered time study, or work sampling study approaches are used, it is sometimes difficult to match the labor hours against the specific work output.

For example, the cashiers in the traffic division of a municipal court may process a large variety of documents continuously throughout the week. While records exist that show the volumes of the various types of work being processed, time cards for the cashiers do not provide a means for allocating specific hours to specific tasks. In these cases, a statistical technique called *multiple regression analysis* can be used to develop a formula that will predict the amount of time to produce different types of work. For regression analysis to be successfully applied in the court, however, it is necessary to ensure that the time reported on the time cards is adjusted to take into account idle time as well as time spent on work not related to the standards. This can sometimes be accomplished by work sampling studies or by temporarily asking for more detail on the employee's time card.

Multiple regression and other statistical techniques are applicable in situations where there are a large number of variables influencing the time to do the work, but where accurate work counts and distribution of labor hours can be obtained. The preparation of pre-sentence investigation reports is one example of a task in the courts that can be effectively addressed using multiple regression analysis.

G. Which Technique to Use

The above description of alternative methods for establishing labor standards has been brief, and many technical details of how to conduct the studies have been omitted. Each of the approaches has advantages and disadvantages, and a sound understanding of which technique to use under each circumstance requires both knowledge of these technical details and experience.

Nevertheless, the court administrator should be able to weigh the advantages and disadvantages when choosing or approving a technique for establishing labor standards in his court. The following are five questions that can aid in the selection of the appropriate technique.

1. *How will the standards be used?* In cases where employees are paid according to the amount of work they produce rather than receive a weekly paycheck based solely on the hours worked, it is important that the labor standard be established with as much accuracy as possible. While the monetary incentive systems sometimes used in industry are not applied in local government, there is a trend toward other types of incentive systems such as awarding time off when a certain amount of work has been completed. "Productivity sharing" systems, in which employees are paid a percentage of the savings resulting from improved productivity, are also receiving interest in local government. In these cases time study and standard data have been traditionally used, but less rigorous approaches can also work well.

On the other hand, when the purpose of the labor standard is to measure the changes in labor efficiency within a court, a high degree of accuracy may not be important. Therefore, work sampling and self-administered studies may be effectively used.

In cases where the objective is to project personnel needs several years into the future, and where the mix of types of work is expected to change, an analysis of historical data may very well provide the precision needed.

In general, the more accurate and reliable the standard, the more complex and costly it is to create and maintain. This leads us to the next quesion which should be carefully considered in selecting an approach.

2. *How much can be spent on establishing and maintaining the accuracy of the standards?* In cases where high quality labor standards are established and maintained, the cost of analysis may be in the neighborhood of 5% to 10% of the cost of the labor being measured. Obviously, in order to justify this level of expenditure, it must be clear that the benefits gained from improvements in productivity will be greater than the cost of analysis.

It is senseless to spend money to establish and maintain labor standards if they are not going to result in improved productivity. Therefore, in answering the question of how much we can spend, the first step is to estimate what the gains in productivity, if any, are likely to amount to. There is no simple answer to this question. Over the years, it has been found that a 20% or more improvement in labor efficiency accompanies the periodic reporting of labor productivity in clerical environments. This

result, however, is not guaranteed, particularly where a reduction in staff is needed to achieve the results.

Moreover, even though the gains in productivity may ultimately justify the expenditure, the budget may not be sufficient to pay for the studies.

Time study and micromotion standard data are the most expensive techniques to use, requiring from three to nine months or more of experience and training on the part of the analyst before satisfactory results may be obtained. Work sampling training may be accomplished much more quickly, although there are subtleties in planning and setting up the study that are not often recognized by the novice. The same applies to the conduct of self-administered time studies and the use of historical data.

3. *Is it necessary to know current labor productivity in relation to normal?* As will be discussed below, it is not necessary to know exactly where one is in relation to normal performance in order to measure trends in productivity. Thus, reporting may be accomplished without ever having established whether or not the current or past levels of productivity are levels that would be considered normal.

However, when it is desired to know where one is in relation to the normal capacity of the organization, some of the techniques described above will not provide the needed information. Only where performance rating is involved, or standard data used, will the labor standard be stated in relation to normal performance. This *will* be the result when time study or standard data is used; it will *not* be the case where self-administered time studies or historical data are used; and it will *not* be the case when work sampling is used unless performance rating is included in the study.

The question as to whether or not one needs to know the normal level of performance is critical to the selection of the work measurement technique, and will substantially affect the cost of establishing labor standards.

4. *Is it necessary to update the standards?* The need to update labor standards is closely linked to the purpose of the standard. If standards are being used to produce weekly or monthly labor efficiency reports, then the reports will be useless at that point in time when the standards are no longer reasonably accurate.

Standards become inaccurate over time for two reasons. First, the method of doing the job is changed by improvements or by the addition or deletion of elements of work. Second, unavoidable idle time, delays, and similar factors change.

If it is necessary to update standards, then consideration must be given to how the updating will be accomplished. One of the most common mistakes made in local government in establishing productivity reporting systems is to hire a consultant to set the labor standards, without having the in-house capability or future resources available to update the standards.

5. *To what extent is there interest in improving methods along with establishing standards?* Certain of the techniques described above have an inherent ability to improve the methods used to accomplish the work. Time study and standard data are the most effective because, in each of these cases, the analyst must document the work method employed. If the analyst is properly performing this function, the obvious inefficiencies should be corrected before setting the standard. Work sampling, self-administered time studies, and historical data, on the other hand, do not produce these results.

Exhibit 3.9 below summarizes some of these considerations.

H. How Labor Standards Are Used

There are several principal uses for labor standards in improving productivity in the courts. These include periodic labor efficiency reporting systems,

Exhibit 3.9. *Differences Among Work Measurement Techniques*

Technique	Need to Make Direct Observations of Work Being Performed	Time Standard Based on Normal Performance	Specialized Training Needed to Collect Data	Work Methods Improved as Result of Study
Time study	Yes	Yes	Yes	Yes
Standard data	No	Yes	Yes	Yes
Work sampling	Yes	No	No	No
Self-administered time studies	No	No	No	No
Historical data	No	No	No	No

forecasting, methods improvement, and scheduling and assignment of work.

1. *Labor efficiency reporting.* How a labor productivity reporting system would work in the courts is best discussed by the use of an example. Let us suppose that we have developed a set of labor standards and are now interested in using them to measure and improve labor productivity. To be specific, let us assume that the standards were set for the key punch group in a municipal court and that we wish to produce a monthly labor efficiency report.

This group is responsible for keypunching selected information on a variety of actions. The punched cards are then sent to the central computer center of the county where they are processed for purposes of preparing indices, notices to be mailed, and other documentation. The work of the key punch group, we will assume, has been divided into a number of tasks relating to the following court actions.

- small claims
- civil complaints
- criminal docket actions
- parking complaints
- other traffic citations
- warrants
- criminal transfers

We will also assume that labor standards for the keypunching time for each task has been established.

In order to calculate the labor efficiency of the key punch group, a series of very simple calculations are performed. All we do is multiply the number of work items accomplished during the month by the labor standard for the item, and add together the person-hours for each item to get a person-hour total for the group. This calculation is shown in Exhibit 3.10 for two hypothetical months.

The term that is used to describe the total person-hours calculated by multiplying the work count by the labor standard is called *earned hours*. To calculate labor efficiency, we simply divide the earned hours by the actual hours spent performing the work.

For example, as shown in Exhibit 3.10 for November we calculated that there were 993 earned hours. The accounting records show that there were 1344 actual hours spent in the key punch group during the month on these work tasks. We would thereby calculate the labor efficiency of the group for the two-week period being reported as follows:

$$\text{Labor Efficiency} = \frac{\text{993 earned hours}}{\text{1344 actual hours worked}} = .74 \text{ or } 74\%$$

Note that if the earned hours had exceeded the actual hours then the labor efficiency would be greater than 100%.

Assuming that our standards are reasonably accurate and that we have properly counted both the work produced and the hours actually spent on this work during the month, then the above calculation implies that the group was working at about 74% of normal performance.

Obtaining this information is an essential step in improving the labor efficiency of the group because we now have, for the first time, a measure of the performance of the group in relation to normal

Exhibit 3.10. *Calculating Labor Efficiency*

November

Transaction	Work Produced		Standard Hours		Earned Hours
Small claims	1,177	×	.0128	=	15.06
Civil compaints	593	×	.0122	=	7.23
Criminal dockets	2,127	×	.0086	=	18.29
Area #1 incoming parking	25,382	×	.0050	=	126.91
Area #2 incoming parking	792	×	.0053	=	4.20
Area #1 paid parking	17,005	×	.0043	=	73.12
Area #2 paid parking	530	×	.0070	=	3.71
Traffic intake	48,527	×	.0095	=	461.00
Warrants	3,940	×	.0055	=	21.67
Dispositions	25,662	×	.0091	=	233.52
File support	2,270	×	.0123	=	27.92
Criminal trans. comp.	121	×	.0095	=	1.15
Total Transactions	**128,126**				

$$\text{Labor Efficiency} = \frac{\text{Total earned hours}}{\text{Total hours worked}} = \frac{993.78}{1344.0} = 73.94\%$$

December

Transaction	Work Produced		Standard Hours		Earned Hours
Small claims	1,111	×	.0128	=	14.22
Civil complaints	596	×	.0122	=	7.27
Criminal dockets	2,173	×	.0086	=	18.68
Area #1 incoming parking	24,890	×	.0050	=	124.50
Area #2 incoming parking	640	×	.0053	=	3.39
Area #1 paid parking	16,793	×	.0043	=	72.21
Area #2 paid parking	426	×	.0070	=	2.98
Traffic intake	40,768	×	.0095	=	387.30
Warrants	3,877	×	.0055	=	21.32
Dispositions	24,460	×	.0091	=	222.59
File support	1,578	×	.0128	=	20.20
Criminal trans. comp.	400	×	.0095	=	3.80
Total Transactions	**117,712**				

$$\text{Labor efficiency} = \frac{\text{Total earned hours}}{\text{Total hours worked}} = \frac{898.46}{1352.0} = 66.45\%$$

performance. Next, we must try to answer the question: "Why is the labor productivity of this group 74% and is there anything we can do to improve it?"

Before discussing what we can possibly do about this situation, let's touch on a couple of things we should definitely *not* do. First, we should not cause a confrontation with the supervisor or the employees. A 74% labor efficiency level in a clerical work environment is not at all unusual.

While the style that one uses in addressing the labor efficiency questions will vary from individual manager to manager, it must be remembered that if meaningful changes in productivity are to be achieved it is essential that the fullest cooperation from employees and first-line supervision be obtained.

To this point we have invested money and time in obtaining an estimate of the labor efficiency, and it is critical that this information be used constructively by all concerned. Under no conditions should labor efficiency reports become a threat to supervision or employees. If they do become a threat, not only will the goal of improved productivity be lost but also much time will be spent in attacking and defending the system. On the other hand, if labor productivity information is presented in a spirit of cooperation, the information will be used constructively by all concerned—including employees—to seek improvements.

Returning to our example, why should or could the productivity of this group be 74% rather than a higher number. Having first satisfied ourselves that the problem is not with our labor standards, we would turn our attention to typical causes of lower than possible labor efficiency. In such a group in the courts, these causes might include the following:

- The key punch operators are not properly trained.
- The group is staffed to ensure that peak loads will be covered, thereby inducing idle time at other points during the day, week, or month.
- The equipment is improperly maintained, leading to loss of production because of machine downtime.
- There are too many key punch operators, perhaps resulting from a change in procedure in the recent past, which reduced the workload.
- There are interruptions such as waiting for transmittal sheets, cards, or other materials.
- The environmental conditions are poor, such as excessive noise, poor ventilation, poor lighting, and so forth.
- The material being presented to the key punch operators is illegible.
- The input of work is scheduled in such a way that there is excessive idle time between keypunching jobs.

In addition to these possibilities, there is, of course, the possibility that the key punch operators are simply not working at a normal pace. This may be the result of social or psychological factors.

The above example, incidentally, is based on a real case study in a municipal court. In this court, the labor efficiency of the key punch group was measured consistently in the range of 60% to 65% for several months. The problem was due to improper scheduling. A procedure had been established whereby all warrant keypunching had to be completed by 4:00 P.M. on Thursday of each week in order to meet a computer run deadline established at the county's central computer center. However, the transmittal documents to allow the warrant keypunching to be initiated were were not available until 9:00 A.M. of the same day. Between 9:00 A.M. and 4:00 P.M. on Thursday, all key punch operators were extremely busy attempting to meet this deadline. There were similar deadlines for other types of documentation during the week, but there were also periods of substantial lack of work and idle time.

In discussions with the key punch supervisor and key punch operators, it quickly became apparent that none of them liked the situation. When there was nothing to do, many of the operators would take extended breaks to avoid being idle at their key punch machines, and this created a certain amount of anxiety. While attempting to resolve the underlying scheduling problems, which involved coordination among several county departments, an immediate solution to the problem was found by providing productive non-keypunch work for the operators during those times in the week where there was insufficient keypunch work. This work included auditing and purging case files as well as fill-in work for absentee personnel in other routine clerical functions in other parts of the court.

In subsequent reporting periods, the time that key punch operators spent on non-keypunch work tasks were, of course, subtracted from the "actual hours" used in calculating the labor efficiency for the group. This, in turn, reduced the denominator in the labor efficiency equation and, with the earned hours remaining the same, the labor efficiency of the group improved to the 90% to 95% level.

The following figures will make this clear. At the beginning there were five key punch operators in-

volving approximately 880 person-hours of time per month, and the earned hours for the group based on labor standards were approximately 570 per month. Initially, the labor efficiency of the group was calculated at approximately 570 ÷ 880 = .65 or 65%. About 265 hours per month of non-keypunch work was assigned the operators. After this change, the actual hours to be used in calculating labor efficiency were 880 less 265 = 615. Since the earned hours remained the same at 570, the new labor productivity for the group became 570 ÷ 615 = or about 93%.

It should be noted that there would only be a true gain in productivity in the above case example to the extent that the key punch operators were assigned needed and productive work elsewhere in the courts.

In the above example, we were measuring performance in terms of labor efficiency. Using the same data that is shown in Exhibit 3.10, it is possible to contrast the labor efficiency concept with that of a labor productivity index.

One index that could be easily formed would be "number of documents processed per person-hour" in the key punch section. From Exhibit 3.10 we note that in November there were 128,126 transactions processed by 1344 person-hours of labor. The index for November would therefore be 128,126/1344 = 95.3 transactions per person-hour.

Similarly, in December we had 117,712 transactions and 1352 person-hours. Therefore, our index would be 117,712/1352 = 87.1 transactions per person-hour.

The results using the productivity index and labor efficiency for these two months can be summarized as follows:

Month	Labor Productivity Index	Labor Efficiency
November	95.3 transactions per person-hour	73.9%
December	87.1 transactions per person-hour	66.5%

It is worthwhile to consider these results carefully. When calculating labor efficiency, not only did we need to know the number of transactions processed and the actual labor hours spent but we also had to have labor standards for all the principal operations that were being performed by the key punch group. In the case of the productivity index we only needed to know total transactions processed and actual labor hours spent. In both cases, the results tell us that the performance decreased between November and December and, moreover, decreased by about the same amount. Why then go to the trouble of establishing labor standards and calculating labor efficiency when the more simple productivity index is telling us the same thing?

There are two answers to this question. The first is simply that "95.3" or "87.1" transactions per person-hour, in itself, tells us nothing about the current performance of the key punch section relative to what the normal performance of the group should have been. In other words, we do not know whether "95.3" transactions per person-hour for November is good, bad, or indifferent. The "73.9%," on the other hand, tells us that the performance of the key punch group was somewhat below normal for November and, as discussed above, gives us a sound point of departure for exploring ways of improving the performance.

The second reason for establishing labor standards and measuring labor efficiency rather than using a productivity index is somewhat more subtle, and lies in the fact that it is possible to perceive that productivity is increasing with an index when it is actually decreasing. To illustrate this possibility clearly, consider the data for the months of January and February for the same key punch group shown in Exhibit 3.11.

Exhibit 3.11 uses the same labor standards that were used in the previous example and uses the same general levels of workload. For the month of January there were 128,400 transactions processed with 1350 labor hours, giving a productivity index of 128,400/1350 = 95.1 transactions per person-hour. Also in January there were 996.1 earned hours, and the labor efficiency was 996.1/1350 = 73.8%.

In February, however, there was an increase in the number of transactions from 128,400 to 130,000, but a decrease in the earned hours from 996.1 to 962.9. The actual hours remained the same at 1350, and the productivity index would be calculated as 130,000/1350 = 96.1 transactions per person-hour and the labor efficiency as 962.9/1350 = 71.3%.

These results for the two months are displayed below:

Month	Labor Productivity Index	Labor Efficiency
January	95.1 transactions per person-hour	73.8%
February	96.3 transactions per person-hour	71.3%

Thus, in using the productivity index method, one would conclude that performance increased from January to February; but in using the labor efficiency

Exhibit 3.11. *Continuation of Data Illustrating Differences Between Productivity Indices and Labor Efficiency*

January

Transaction	Work Produced		Standard Hours		Earned Hours
Small claims	1,000	×	.0128	=	12.8
Civil complaints	600	×	.0122	=	7.3
Criminal dockets	2,000	×	.0086	=	17.2
Area #1 incoming parking	25,000	×	.0050	=	125.0
Area #2 incoming parking	800	×	.0053	=	4.2
Area #1 paid parking	17,000	×	.0043	=	73.1
Area #2 paid parking	500	×	.0070	=	3.5
Traffic intake	49,000	×	.0095	=	465.0
Warrants	4,000	×	.0055	=	22.0
Dispositions	26,000	×	.0091	=	236.6
File support	2,000	×	.0123	=	24.6
Criminal trans. comp.	500	×	.0095	=	4.8
Total Transactions	**128,400**				

$$\text{Labor efficiency} = \frac{\text{Total earned hours}}{\text{Total hours worked}} = \frac{996.1}{1350.1} = 73.8\%$$

February

Transaction	Work Produced		Standard Hours		Earned Hours
Small claims	500	×	.0128	=	6.4
Civil complaints	300	×	.0122	=	3.7
Criminal dockets	2,800	×	.0086	=	24.1
Area #1 incoming parking	30,000	×	.0050	=	150.0
Area #2 incoming parking	800	×	.0053	=	4.2
Area #1 paid parking	20,100	×	.0043	=	86.4
Area #2 paid parking	500	×	.0070	=	3.5
Traffic intake	47,000	×	.0095	=	446.5
Warrants	6,000	×	.0055	=	33.0
Dispositions	21,000	×	.0091	=	191.1
File support	500	×	.0123	=	6.2
Criminal trans. comp.	500	×	.0095	=	4.8
Total Transactions	**130,000**				

$$\text{Labor efficiency} = \frac{\text{Total earned hours}}{\text{Total hours worked}} = \frac{962.9}{1350.0} = 71.3\%$$

method, one would conclude that productivity decreased. What happened? The answer can be seen by closely inspecting the change in relative workload between types of transactions for the two months. In February there were more transactions, but they were performed on types of jobs that required less work. Therefore, earned hours decreased, as did labor efficiency, even though the productivity index increased. In other words, the productivity index shows performance improving when it had actually deteriorated!

The above example is intended to illustrate one of the pitfalls in the use of productivity indices and to highlight the essential difference between productivity indices and labor efficiency calculations. However, one should not conclude that labor efficiency is always preferrable to productivity indices in the courts.

First of all, if the mix of types of cases being handled remains relatively constant even though the total workload may be increasing or decreasing, the productivity index approach is not likely to indicate productivity increasing when it is actually decreasing, or vice versa. Second, if labor efficiency information cannot be effectively used by supervision, then there is no reason to spend the substantial additional money needed to set up the labor standards for its calculation.

The productivity index method can be made sensitive to relative differences in the time to perform the transactions by weighting each of the transactions to obtain what would be called a weighted index. Unfortunately, the time and trouble to set up the weighting system may be no less than that involved in setting up labor standards.

Overall, the advantages of reporting productivity by means of labor efficiency is that it tells us where we are in relation to normal and more accurately reflects month-to-month changes in the real performance due to changes in the mix of types of cases being handled. The advantage of reporting productivity by means of a productivity index is that it is much easier to set up and maintain, since labor standards are not required. Neither labor efficiency nor productivity indices are worth establishing without the concomitant ability of the court to utilize the information for productivity improvement.

There are two additional questions that have to be addressed in successfully designing and operating a productivity reporting system in the courts. These are: (1) How frequently does one report productivity? and (2) What is the format of the report?

Most productivity reporting systems seem to operate well with a reporting period of one month. Since actual hours are required to calculate the performance measure, whether it is labor efficiency or productivity, it is sometimes easier to set up the system to operate in consonance with pay periods. In this way the actual time may be taken directly from time cards. For example, if biweekly time cards are submitted, the productivity report could be issued every four weeks thereby including exactly two pay periods. Reporting periods shorter than two weeks should be considered where it is possible for

supervision to use the information for management purposes at such intervals.

The format of the report itself can be quite important and a graph of the level of performance over time rather than a tabular type of presentation is normally the best. It is not necessary to use the phrase "labor efficiency" as the title for the report, and a more acceptable euphemism such as "performance" or "productivity" may be preferable even though labor efficiency is being measured.

Exhibit 3.12 shows three formats for presenting month-by-month trends in labor efficiency for the traffic division of a municipal court. In all cases, the chart is labeled across the bottom by month of the year. The other axis of the chart can be labeled in various ways.

In the first format, the chart is labeled in percentage of normal performance. In the second format, labor efficiency has been converted to a scale of "dollar efficiency" in which $1.00 is equivalent to 100% performance. The idea is that at 100%, $1.00 of work is produced for $1.00 spent; at 80% efficiency, 80¢ is produced for $1.00 paid, and so forth. In the third format, all numbers on the scale have been removed entirely, but the chart was color coded into three regions: below 60% is shaded red, between 60% and 95% is shaded yellow, and above 95% is shaded blue. The color is used to connote the current state of affairs and the objective is to get the trend line into the blue area.

When these three alternatives were presented to first-line supervision in the court, they all preferred the third alternative.

Obviously there are many ways of displaying labor productivity information and it is always preferable to consult with both supervision and employees as to

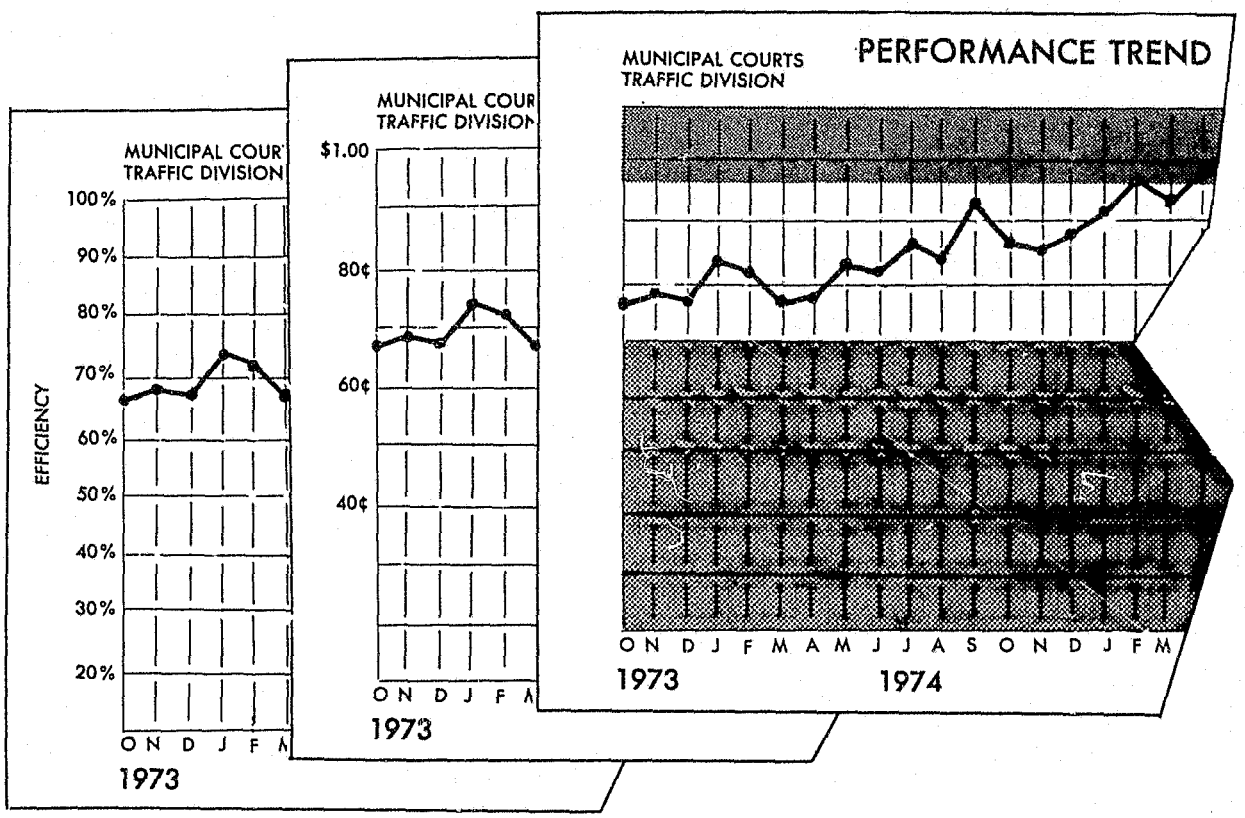


Exhibit 3.12 *Reporting Labor Efficiency*

The three charts illustrated above show three ways of reporting labor efficiency. In the chart to the left, efficiency is reported in terms of percent of normal performance. In the middle chart, it is reported in terms of dollars worth of work produced per dollar paid. The chart at the right has been shaded to indicate ranges of performance. The bottom shaded range denotes the area of extreme concern; the middle unshaded range denotes the area in which improvements should be pursued; and the upper shaded range denotes the level of performance that is the goal. All three charts present exactly the same performance trend line. However, the way the axis of the chart is labeled affects the way supervision and employees perceive the purpose and use of the system. Many other alternatives are possible.

what they consider the most useful and acceptable format.

Overall the key to successfully developing and operating a productivity reporting system lies in two main considerations. These are:

- The system must be sufficiently accurate so that it is credible to the persons using it. If standards have been poorly set up or are allowed to become inaccurate, then the system will not be reporting true changes in productivity or levels of efficiency. This will be quickly detected by both employees and supervisors and the system will be ignored.
- The information must be used in a constructive way by supervision and must not be allowed to degenerate into a threatening or repressive management control system. In order for the system to encourage and guide continuing attempts to improve productivity, it must be perceived as constructive by employees. While an inaccurate system will be ignored, a threatening system will be easily destroyed by both employees and supervision through inaccurate reporting.

For these reasons, the design and implementation of productivity reporting systems must be carefully planned, and there must be sufficient resources and expertise to see that they are properly installed. Most importantly, supervision must be trained in the appropriate use of the system.

If these objectives are met, these types of systems can be an invaluable aid in improving productivity in the courts.

Other uses for labor standards and the techniques of work measurement lie in methods improvement, scheduling and related management tasks.

I. Use of Labor Standards in Methods Improvement

When a new piece of equipment is being contemplated, when a change in the layout of the court facility or a new procedure is being considered, work measurement can aid in the selection of the proper alternatives by accurately forecasting the labor requirements.

If it is possible to run a pilot program with the new procedure or equipment, any of the techniques of work measurement discussed above can be used to provide an estimate of the savings that will be associated with the program.

In cases where a pilot operation is not possible, standard data systems may be used to provide an estimate of the time to perform the work with the new procedure. This is possible because these systems do not require the direct observation of the work being performed. It is only necessary to have a step-by-step description of the contemplated change in work methods.

J. Uses of Labor Standards for Scheduling, Forecasting, and Making Work Assignments

Regardless of how the time standard is reached, labor standards can be used to produce better forecasts of personnel needs in response to increasing workloads or to changes in the mix of cases being processed.

Using the standards for the key punch group in Exhibit 3.11 as an example, we can readily predict the impact of an increase in small claims actions on the workload of the group. As shown in Exhibit 3.11, the standard time for processing a small claims action is .0128 hours per action, which with the present workload of about 1150 transactions per month would require about 15 person-hours of time at the 100% performance level. If the number of small claims actions are increased to 2000 per month, for example, as a result of a change in law increasing the maximum claim that could be filed, then an additional 850 actions would be processed.

At .0128 hours per action this implies an additional 11 person-hours of key punch time per month at 100% efficiency. Since the current level of efficiency in the key punch section is on the order of 75%, we would estimate that the actual personnel needs would be 11/.75 = 14.5 person-hours per month.

In a similar manner, labor standards can be used for making more equitable work assignments and for scheduling of work in ways that minimize idle time of clerks while ensuring an adequate amount of time to complete the work.

As discussed above, it is not necessary that labor standards be established as a result of an elaborate work measurement program. What is important, however, is that they be available and organized in a way that supports management needs.

CHAPTER IV. LAYOUT AND FACILITIES PLANNING IN THE COURTS

The planning and design of court facilities is a topic that has generated considerable interest in the last few years. Studies have been mainly directed toward improving the functional arrangement of the courtroom, improving the efficiency and security of the movement of criminal defendants, and in better locating the many special-purpose work areas needed in the modern courthouse. In this chapter we will touch on some of these issues, but we will emphasize improved layout as a means for improving clerical productivity.

A. Designing Efficient Facilities

When a new court facility is being planned, there is a golden opportunity to design the facilities in such a way that the sections of the court are located in efficient relationship to one another and that equipment is properly selected and positioned. Unfortunately, the opportunity to start from scratch is infrequent, and the problem that one typically encounters is an existing facility which has become inefficient and overcrowded. While rearranging existing facilities can be an expensive undertaking, there are many improvements in productivity that can be made at a minimal expense by simply rearranging furniture, adopting different types of filing equipment, and by the installation of material handling equipment.

Apart from security and environmental considerations, the principles of effective layout are based on a simple objective: Design the facility in such a way as to minimize the movement of people and materials. Since the movement of people and materials takes time, it costs money. Minimizing these movements thus reduces the cost of operating the facility or, stated otherwise, improves productivity.

Although standards are available for such matters as aisle width, square feet per employee, and so forth, designing an effective layout is perhaps more of an art than a science.

B. Analyzing an Existing Layout

What are the steps required to analyze and improve a layout of clerical areas in the courts? The following briefly outlines the typical industrial engineering approach to this problem.

- At the outset, it is important to identify that there is indeed a problem, which is possibly solved by a new layout. Sometimes the problem may be obvious, such as congestion in the aisles or filing areas, or simple overcrowding. In other instances, there may be predictable future problems such as diminishing document storage space. Also, it may be perceived that there is too much movement of people, and that this movement is perhaps unnecessary. Before proceeding, however, it is important to explore solutions by changes in work methods rather than a new layout.
- If symptoms of the problem are measurable, then one should obtain at least a rough estimate of costs of the existing conditions. For example, if clerks have to walk 100 feet or so to consult files continuously throughout the day, one can estimate the amount of time that is spent walking to retrieve documents. This estimate need not be the result of an elaborate study. For example, a quick work sampling study as described in the previous chapter can be used, or an hour or so of observations can be used to approximate total time spent.
- Prepare documentation that describes the existing conditions. This will normally take two forms. The first is what is called a "travel chart," and is illustrated in Exhibit 4.1. This chart shows the relative volume of movement between various functional segments of the organization, and serves as a guide to where and how to relocate functions so as to minimize the travel volume. The second is a drawing of the work area showing the furniture and equipment. How to effectively construct these draw-

ings is an important point that is discussed below.

- Try alternative relocation of "blocks" of activities. This is called a *block layout* and is illustrated in Exhibit 4.2. Estimate the savings in time associated with the new block layout by determining the reduction in travel time.
- After a block layout has been prepared which appears to satisfy the objective of minimizing travel-distance criteria, lay out the details of the furniture and equipment. If the block layout has been done correctly, they should fit. At this point, one must be careful to ensure that minimum aisle widths are provided and that

FUNCTION	PROBATION INTAKE AND PROCESSING	WELFARE-COURT LIAISON	MENTAL HEALTH SERVICES	SOCIAL ASSISTANCE	SCHOOL-COURT LIAISON	CLERICAL SUPERVISION	CLERICAL	CALENDARING	PROCESS NON-LOCAL SUPPORT	RECORD ADMINISTRATION	CHILD SUPERVISION	PROCESS SUPPORT AND BAIL	CITY-WIDE CLERICAL SUPERVISION	PRINTING AND SUPPLIES	ADMINISTRATION	TEMPORARY DETENTION	PRIVATE JUDICIAL	LEGAL SECRETARIAL	LEGAL ASSISTANCE	LEGAL REPRESENTATION	RECORD PROCEEDINGS	COURT SECURITY	INTERPRETING	EXTERNAL PARTICIPATION	TRIAL AND HEARING	ANCILLARY TO TRIAL AND HEARING	LEGAL RESEARCH
PROBATION INTAKE AND PROCESSING		1	1	5	4		5	4	2	5		1				2	5			4		1		5	5		
WELFARE-COURT LIAISON	1			3	3	1			1	5		5					4			5					5		
MENTAL HEALTH SERVICES				1													3							1	5	3	
SOCIAL ASSISTANCE	5	3			5					4		3					5							4	5		
SCHOOL-COURT LIAISON	5	4		5						4		1					3			2					5		
CLERICAL SUPERVISION	1			1			2	5	1	2	1	2	4		1		2				1	1	1		2	1	
CLERICAL	1			1	1	2		4	1	4							1				1	1	1	2	3		
CALENDARING	4		1			4	4		1	3							5		1	4		1			3		
PROCESS NON-LOCAL SUPPORT	1	3				1	2	3		4		5					5			1		1			5		
RECORD ADMINISTRATION	1	1		1	1	2	2	1	1			1	3		1	1	3		2	1		1					
CHILD SUPERVISION	1	1		1		1																2			1		
PROCESS SUPPORT AND BAIL	4	5		3		3		1	3								3			1					4		
CITY-WIDE CLERICAL SUPERVISION						1	1	1		1	1			1	5		3				1	1	1				
PRINTING AND SUPPLIES			1			1	1	1	1	1		1			1		1	1	1		1						
ADMINISTRATION	1	1	1	1	1	1	1	1	1	1	1	1	2	1			5	1	1	1	1	1	1		1	1	1
TEMPORARY DETENTION	1		1														1				3				5	5	
PRIVATE JUDICIAL	4	3	2	1	1	1	1	1	1			1	1		3			3	4	3	3	2	1		5	4	3
LEGAL SECRETARIAL																	1		1								
LEGAL ASSISTANCE										4							5	3			3						5
LEGAL REPRESENTATION	4	3	1	1	2	1	2		2	2		2				5	5		2						5	4	3
RECORD PROCEEDINGS						1											2			2					4	4	
COURT SECURITY	4		4	3		1	1	2		2	1		1		1	3	3								3	3	
INTERPRETING	2						2		2							2	2			2					3	2	
EXTERNAL PARTICIPATION	5	1	1	4		2	4	1	5	2	1	3				3	4			4					5	4	
TRIAL AND HEARING	1	1	3	1					1	1		3				1	4			2	2			2		4	2
ANCILLARY TO TRIAL AND HEARING	1															1	2			2	1			1	5		2
LEGAL RESEARCH																	2		4	2				1	3	3	

Source: Wong, Michael F. "Space Management and the Courts—Design Handbook". Grant from National Institute of Law Enforcement and Criminal Justice, U. S. Department of Justice. Government Printing Office, 1973.

Exhibit 4.1 *Travel Chart in Court Clerical Operations*

The chart above shows the relative volume of travel and communications between functions in a court. The chart provides a way of organizing the information needed to locate departments in a facility in such a way that the cost of travel and communications between departments is minimized.

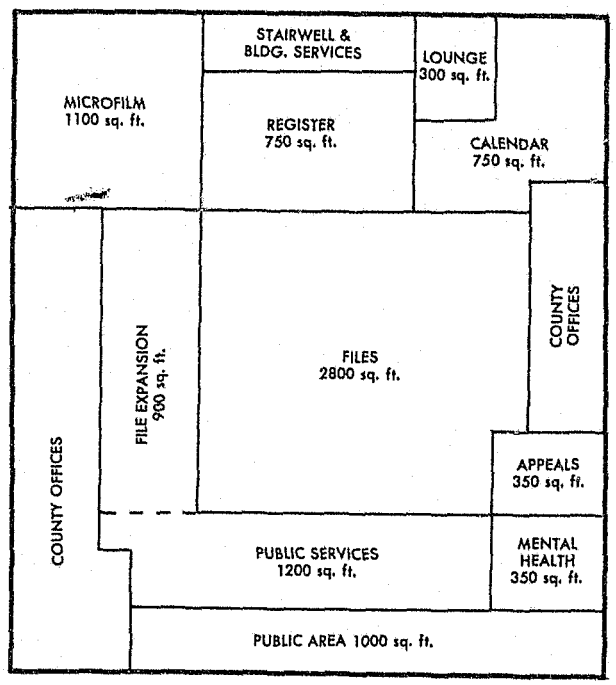


Exhibit 4.2 *Block Layout in the Courts*

A block layout of a new layout is prepared to analyze the movement of materials and persons. The purpose of the diagram is to determine the relative location of sections of the court so as to minimize travel subject to meeting environment requirements and space needs. A number of block layouts will be prepared before undertaking a detailed layout.

employees within each section are located in a manner that facilitates communication and exchange of documents. Also, environmental considerations such as glare from windows or lighting, noise, access for visitors, and privacy must be taken into account.

- When an improved layout has been designed, obtain an estimate of the cost of implementing the change. This will include the costs of moving the furniture and equipment from its current location to the new location, the costs of removing and rebuilding partitions, the costs of changing phone and electrical outlets, the costs of any lighting changes, carpets, painting, etc., as well as any cost for making up lost production while the move and subsequent refurbishing are taking place. Compare this cost with the savings that have been estimated in step 2 above, in order to help justify the new layout in addition to other improvements such as increased file capacity and improved environmental conditions.

C. Improving Proposed Designs

The following are some questions that may point to the need for improved clerical office arrangements in the courts. These same questions may be useful in evaluating a proposed layout.

- Are related departments near each other?
- Have peak work levels been considered in terms of documents and necessary personnel, as opposed to average conditions?
- Have supplementary work groups been strategically arranged around the primary work group that they serve?
- Have future record storage requirements been accurately projected?
- Have desks been located in such a way as to prevent a glare problem, and are noisy operations isolated?
- Has open shelving been used for storage, thus eliminating the need for drawer space?
- Have partitions been selected in such a way as to maximize the amount of light and feeling of spaciousness? When selecting partitions, keep in mind the possible necessity of a future change and the subsequent cost of that change.
- Have the desks of the employees who are involved in a series of operations been placed in such a way as to minimize the time and effort of passing work from one area to another?
- Is the employees' supervisor located in an easily accessible location and near those who are being supervised?
- Are the employees who have the maximum communication with the public, or other outside persons, located nearest to the entrance of the area, thereby eliminating distractions an congestion?
- Has provision been made for future expansion?

D. Drawing Preparation

It might appear that the method used to prepare drawings of the plan is not of great importance. This is not the case, however, and the use of acetate templates in designing proposed layouts is usually an invaluable aid.

When a new layout is being planned in the courts, assistance will normally be obtained from the office of the city or county engineer or architect. At some point in the planning stage, a drawing of the layout designating not only the location of desks and equipment but also the partitions, electrical outlets, phone services, lighting, drinking fountains, and so forth, must be prepared.

Exhibit 4.3 *Material Handling Devices*

Material handling devices can substantially improve the efficiency of court operations. The photograph at the left shows an endless chain type document conveyor transporting case files from a central file area to another location on the same floor. In the photograph at the right a pneumatic tube is used to transport traffic citations between the reception desk and the supporting clerical group in a traffic court. The dumbwaiter shown to the left of the pneumatic tube is used to move batches of documents between floors.

Traditionally, these types of drawings are done in either pencil or ink on vellum paper, and a blueprint is made. In preparing the drawing, the architect will first make sketches that are reviewed by the court administrator, judges, and affected supervisors. These sketches will then be converted to a plan-view type of drawing by a draftsman.

There is another technique for preparing layouts that is particularly attractive from the standpoint of the court administrators, first-line supervisors, as well as judges. This technique uses movable acetate templates of the furniture and equipment that are affixed to an acetate sheet. A print of the acetate sheet may be made easily at any blueprint facility or on an office copy and, since the templates are movable, changes may be made readily.

Using this process, a first-line supervisor or court administrator may make changes by *himself* without relying on the two- or three-day turnaround time normally needed to obtain a conceptual drawing. In addition, the acetate layout, with all desks and equipment affixed in the form of movable templates, is always available for an instant visualization of the impact of minor rearrangements in the office area.

Exhibit 4.4 shows how the layout is made. At first glance, it might appear that a great deal of work is required to make an acetate template layout. This is not the case. Acetate templates of desks, files, conference tables, computer terminals, vending machines, and a wide variety of common office equipment, may be purchased commercially from firms that specialize in artist-aid materials. Tapes may also be purchased to denote the partitions and aisles, and special symbols printed on pressure-sensitive material may be purchased to designate phone outlets, electrical outlets, and so forth. With the exception of unusual pieces of equipment, there is very little in the way of materials needed to prepare the layout that cannot be purchased at minimal expense.

The result is a highly pictorial yet technically accurate drawing of the facility, which can be made by persons not skilled in drafting, and without the use of drafting equipment.

From the standpoint of the court administrator, this technique offers significant advantages over traditional drawing preparation methods. First, many alternative arrangements of equipment may be tried without having to rely on a draftsman and several days of waiting between ideas. For example, four or five different layouts of a 5000 square foot office area may be easily completed in a single day, as well as a blueprint made of each one. Second, the layout achieved is more pictorial than that normally ob-

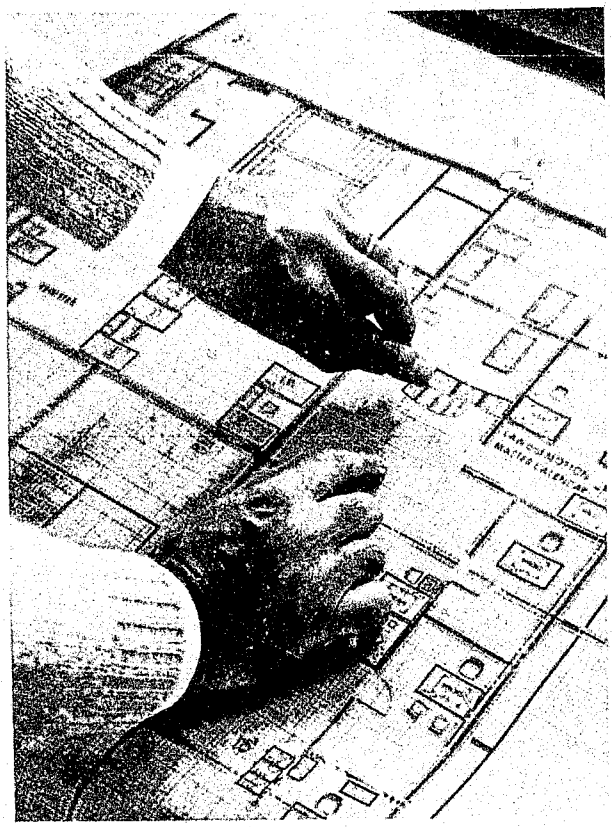


Exhibit 4.4 *Acetate Template Layouts*

Careful layouts of the court clerical facilities are important in improving the efficiency of operations. The photograph shows how acetate templates are used for producing plans that can be easily modified, updated with little difficulty, and that allow all persons to readily visualize proposed changes.

tained by traditional architectural drafting procedures, and it facilitates discussion and explanation of proposed changes to employees, judges, county administrators, or others who may have to approve the concept. Once a plastic template layout has been prepared, it can be used over and over for minor equipment rearrangements, partition changes, phone service changes, and so forth, for a number of years. By contrast, pencil or ink drawings will only stand a limited number of changes. Moreover, with little effort, the template layout is always up-to-date and available for discussing space needs and their solutions.

E. An Evaluation Checklist

Below, a set of checklists are presented that summarize some of the important considerations in the evaluation of court facilities. While a "no" answer to a question on these check lists does not necessarily indicate defective design, it may flag an area in which further consideration is warranted.

The Courthouse

	Yes	No
In site evaluation, has consideration been given to changes and growth of population centers, public transportation facilities; proximity to community centers and accessibility of court-related facilities, such as hospitals, police stations, the jail, drug treatment centers, half-way houses and other related institutions?	___	___
Has site evaluation given adequate consideration to the future as well as present needs of the building or complex?	___	___
Has the site evaluation taken into account topographic, climatic and orientation factors that could adversely or favorably influence building design?	___	___
Has consideration been given to convenience of the site for both attorneys and general public? Most attorneys in urban areas are located in commercial or financial centers of the city.	___	___
If a multi-story courthouse is proposed, have major court functions been located and designed to minimize the duplication of spaces which could be shared such as robing rooms, chambers and conference rooms?	___	___
Have courtroom, departmental and judges' floors been planned in vertical segments each served by its own elevators and staircases so as to facilitate security and decrease travel times?	___	___
Are space allocation plans in consonance with the method of assigning cases and judges to courtrooms, and with respect to the location and degree of centralization of the clerk's office?	___	___
Have floors nearest the entrance level been assigned as public spaces, including clerical, administrative and jury assembly spaces?	___	___
Have escalators rather than elevators been considered to move persons to and from their destination on adjoining lower public floors thus reducing waiting time and congestion during peak periods?	___	___
Have separate entrances been provided for judges, public, staff and prisoners?	___	___
Can prisoners be transferred by secured elevators or stairs, physically separated from public or judges' elevators or stairs?	___	___
Have portions of courtroom floors been designated as "public," "restrictive," "private" or "secured" spaces (courtrooms, public conference rooms and waiting rooms are readily accessible to the public; private conference rooms and departmental offices are restrictive spaces; judges' robing rooms and chambers are private spaces; prisoner holding and interviewing facilities are secured spaces)?	___	___
Has consideration been given to increased future use of computer systems and automation in courts and its effect on personnel use, method of operation and space requirements?	___	___
Have security systems been analyzed as an integral part of the design?	___	___

The Courtroom

	Yes	No
Does the design of the courtroom create a symbolic extension of the concept of justice?	___	___
Is the courtroom size and shape determined by functional and environmental requirements, the kinds of cases handled and the routine number of participants and spectators?	___	___
Does the courtroom have separate entrances for spectators, press, litigants, witnesses (public); judge, jury, attorneys, court personnel, witnesses (private); and prisoners and court officers (secured)?	___	___
Can heavy furniture such as the judge's bench, clerk's station, witness box, jury box and attorneys' tables be constructed in modular sections which may be reassembled to provide flexibility?	___	___
Has provision been made for central recording of court proceedings (microphones should be designed as an integral part of courtoom furniture, and space and personnel required for efficient operation should be planned in advance)?	___	___
Have the courtroom interiors been designed to minimize acoustical problems?	___	___
Is the judge's eye level when he is seated higher than any other participant or spectator, standing or seated?	___	___
Can the judge be able to alert, without detection in the courtroom, a central security system?	___	___
Can attorneys move easily from their stations to a lectern, the judge's bench, court clerk's station, court reporter's station, jury box and witness box?	___	___
Can attorneys and litigants see, hear, and be seen and heard by judge, witnesses, court clerk, jurors and court reporter?	___	___
Are attorney's stations sufficiently lighted to enable them to read fine print on legal documents?	___	___
Is each attorney's station equipped with (or provisions made for) a microphone connected to an amplifier controlled either by the judge or the clerk?	___	___
When not testifying, can witnesses in controversial trials be isolated for their safety and protection?	___	___
Since witnesses may be under emotional strain, are the environmental conditions in which they wait calm and cheerful?	___	___
Is there a "non-encroachment distance" between attorneys and witnesses of at least 6 ft.?	___	___
Can witnesses see, and be seen as close to full face as possible, and hear attorneys, judge, court clerks and jurors?	___	___
When answering attorney's questions, can witnesses be clearly seen and heard by attorneys, judge, jurors, and court reporter?	___	___
Is the witness box equipped with a microphone connected to an amplifier controlled by the judge or the clerk?	___	___
Are jurors sufficiently removed from the public to avoid interference and improper influence?	___	___
Is a bailiff or court officer located between jurors and the public to prevent communication between them?	___	___
Are jurors adequately separated in distance—a minimum of 6 ft.—from attorneys and litigants to prevent their overhearing private conversations?	___	___
Are jurors located on the same side of the judge as is the witness?	___	___
Is the furniture and equipment used by the court reporter designed as an integral part of courtroom furniture thus maintaining court dignity by providing for orderly stacking of steno-tapes, etc.?	___	___
Is the court clerk's work surface surrounded by a 6- to 9-inch high rail to prevent attorneys from seeing documents and to cover sound recording equipment, if placed on the work surface?	___	___
Does the court clerk's station have the same alarm/intercom system as the judge (a direct intercom line to a central security area)?	___	___
Can the bailiff see all participants and public?	___	___
Are members of the press too close (less than 9 ft.) to attorneys and litigants who may want to engage in private conversation?	___	___
Are adequate telephone facilities available to the press and in close proximity to courtrooms on each floor?	___	___
Is a press room available in close proximity to the building entrance?	___	___

Judges' Chambers

	Yes	No
Does the judge's chamber or the secretary's office lead directly into a courtroom?	___	___
When chambers are located on more than one floor away from courtrooms, or when judges are assigned to different courtrooms on a rotating or other basis, are small robing rooms provided behind courtrooms for conferences and for judges to work during short courtroom recesses?	___	___
Are judge's and law assistant's work areas well-lighted, quiet and finished in colors and textures that create an atmosphere conducive to reading and writing legal documents?	___	___
Is the judge's conference area, which can be a separate room adjoining his chamber, well-lighted with a moderately low background noise and with greater contrast in color and texture than the work area?	___	___
If the conference area is separate from the judge's chamber, can the space be much better utilized if shared by two or more judges to hold conferences with attorneys and staff?	___	___

Jury Facilities

	Yes	No
Is there an effective sign system to guide prospective jurors to jury assembly spaces?	___	___
Is the main jury assembly area planned, not as a large space housing row-upon-row of benches, but in small spatial units with movable lounge or office furniture, arranged so as to stimulate interaction between prospective jurors?	___	___
Is adequate space provided close to the jury assembly area for jury clerks to call jury panels, prepare jury lists and arrange payment to jurors?	___	___
Because some prospective jurors may wait long periods before being called, are assembly rooms		

	Yes	No
cheerful and spacious and equipped for activities such as reading, television and games such as chess or checkers?		
Since prospective jurors may desire to do personal work while waiting to be called, are appropriately designed work areas provided?		
Are jury impaneling rooms of soundproof construction so that *voir dire* is not disrupted by external noise?		
Is the jury box on the same side of the courtroom as the witness so that the attorney questioning the witness will not block the jury's view of the witness?		
Is a jury deliberation room directly and privately accessible from the jury box so that the jury does not have to pass in front of the public seating area when moving to the jury deliberation room?		
Is an entrance lobby to the deliberation room provided for jurors to leave coats and store personal belongings?		
Has adequate consideration been given the activities and space requirements of the bailiff responsible for security and safety of jurors during jury deliberation?		

Prisoner Holding Facilities

	Yes	No
Are air-conditioning and ventilating registers and lighting fixtures designed to prevent their removal and use as weapons?		
Does each prisoner holding facility have a combined wash basin and toilet unit constructed of stainless steel installed along the wall on the corridor side of the facility so that repairs can be made from the outside?		
Is the distance of movement of prisoners from temporary detention facilities to courtrooms as direct and as short as possible?		
Are adequate secured interview spaces provided for attorneys to interview their clients?		
Are security measures taken to avoid the passage of weapons and drugs into the prisoner holding facility?		
Are all prisoner holding facilities and secured interview spaces properly ventilated, well-lighted and reasonably maintained?		

Special Considerations Related to Security

	Yes	No
• Are private corridors, stairs and elevators provided for each category of persons requiring complete privacy?		
• Do detention spaces directly feed each criminal courtroom?		
• Do detention floors or floor areas in a criminal courthouse connect directly to a detention building and feed directly and only to spaces where prisoners are routinely sent?		
• Are chambers located in close proximity to each other on their own separate floors or floor areas?		
• Is there limited and controlled public access to chambers spaces?		
• Are there private building entrances for judges and prosecuting attorneys?		
• Are there a limited number of doors giving public access to building?		
• Are public functions (complaint, arraignment, bail and parole hearings) on first and lowest floors?		
• Are there secured building entrances into detention spaces for prisoners under arrest?		
• Are facilities with higher security needs located in proximity to each other and away from public and low security areas?		
• Are there double walls or soundproofed walls for jury deliberation rooms?		
• Are courtrooms located away from public spaces, such as washrooms, in which bombs can be easily hidden?		
• Are there no furnishings and objects of lightweight or flimsy construction in or near courtrooms which can be used, wholly or broken, as weapons. (Chairs, ashtrays, tables, lamps and other furniture would be included in this category)?		

F. An Example of Layout Changes in a Superior Court

The layouts shown in Exhibits 4.5 and 4.6 show the existing and changed layout of a portion of a Superior Court facility and illustrate some of the principles discussed above. The area contained active files, calendaring, microfilming, registering of documents, a public counter, and space for personnel dealing with probate, appeals, and mental health cases. Approximately 12,000 square feet of floor space was involved.

There were numerous problems with the existing arrangement that had been steadily growing over a number of years. The capacity of the open shelving files was rapidly being absorbed. Some activities were being performed in areas that were not conducive to efficient work because of factors such as noise and glare. There was excessive movement through the area since the location of the groups required extensive and repeated travel to other locations on the floor.

The improved layout was accomplished using the steps outlined at the beginning of this chapter. First, travel charts were prepared to organize information as to the preferred location of each function in relation to other functions. Second, several alternative block layouts were made, taking into account the travel chart information as well as requirements for providing service to the public and for environmental needs. One of these block layouts was selected as the most promising. Third, an acetate template layout of the existing arrangement was

prepared, which designated the location of all files, desks, counters, partitions, and permanent building fixtures. Using the acetate template layout, the templates were arranged to provide five alternative detailed configurations of equipment and furniture. Costs of the alternatives were calculated and each alternative reviewed with first-line supervision to ensure that all factors had been considered. From this review, one of the alternatives was selected as being the best.

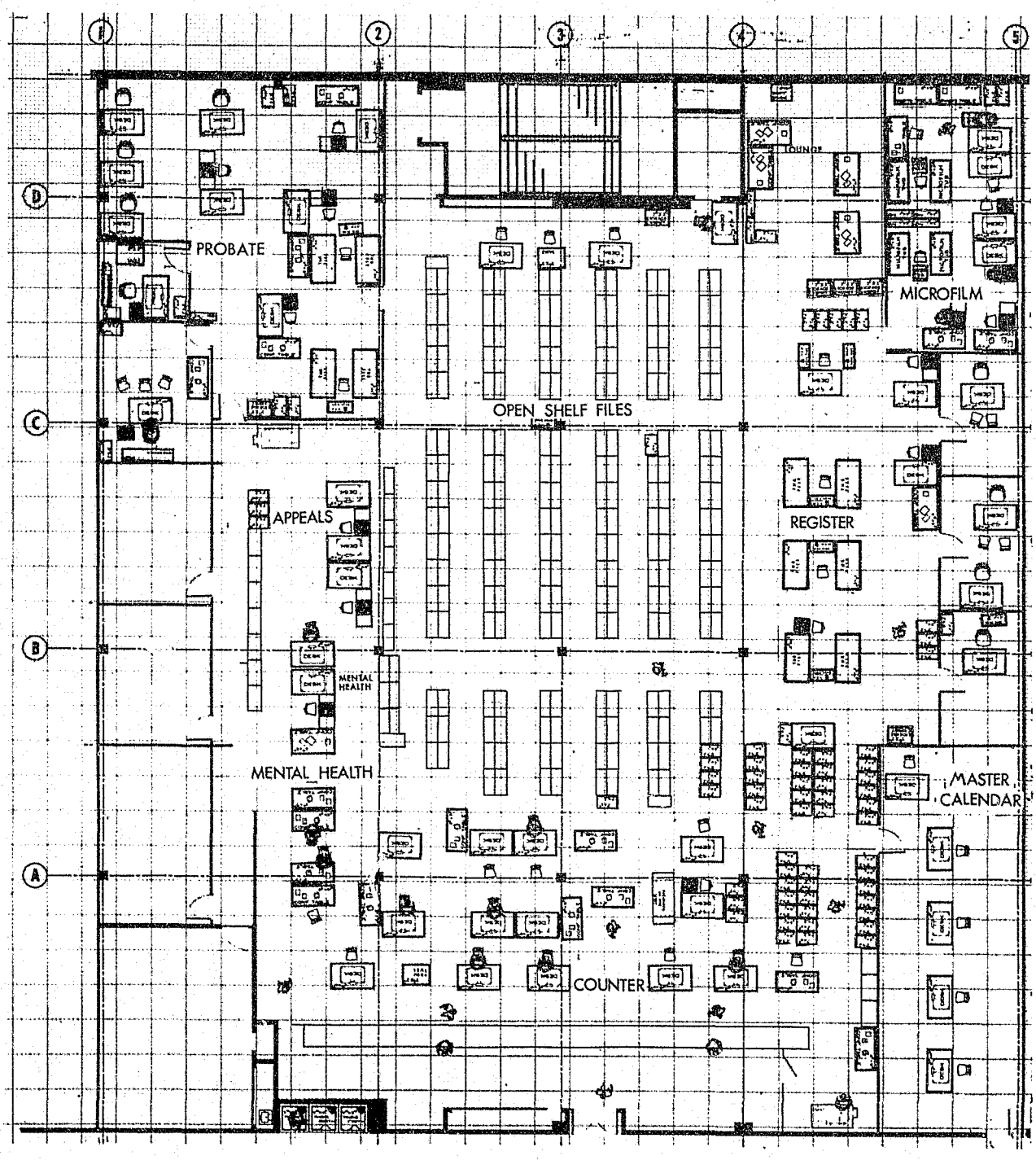


Exhibit 4.5 *Clerical Area Before Layout Changes*

Layout of a portion of a superior court clerical area before introduction of automated files.

The changes in the layout and the reasons for them are briefly described as follows:

- The existing open shelving was replaced with automated files. The existing open shelving and file cabinets provided for approximately 50,000 lateral inches of storage space. File space was being absorbed at the rate of slightly over 400 inches per month, and the capacity of the file area was going to be exceeded in about three years. The room had a 15-foot ceiling height.

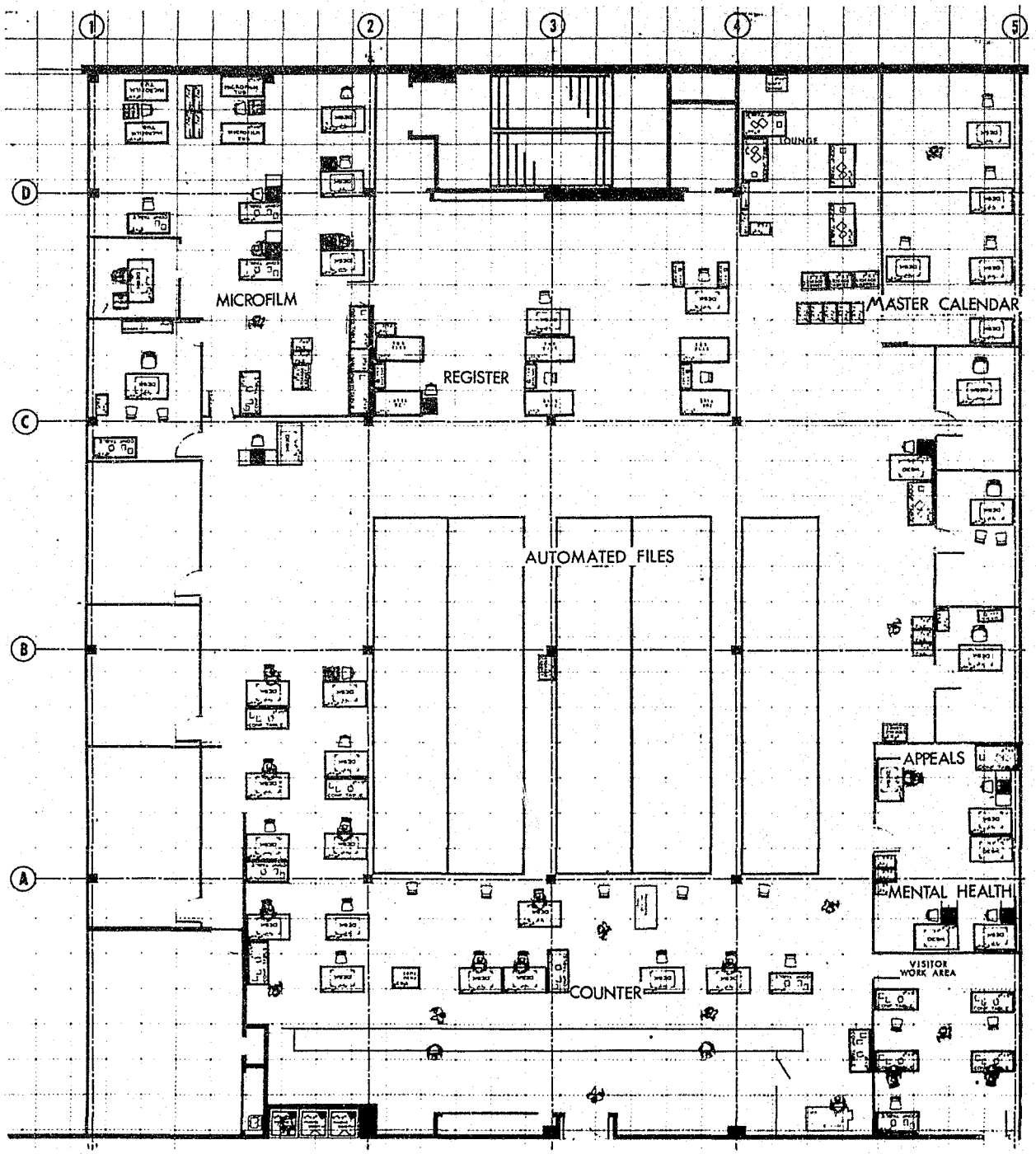


Exhibit 4.6 *Clerical Area After Layout Changes*

Layout of a portion of a superior court clerical area after introduction of automated files and relocation of departments to reduce movement of persons and documents, and to improve environmental conditions.

The alternatives for increasing the filing capacity included:

—The construction or rental of a new facility,

—Replace existing open shelving with mechanized file systems.

The mechanized file systems were selected as the best alternative after considering the costs of the alternatives. The proposed system doubled the capacity of the file with no additional floor area needed, as well as provided a 35% improvement in the labor efficiency of document filing and retrieval. The space savings were obtained by elimination of access aisles and by the ability to fully utilize the high ceiling in the room.

- The Mental Health and Appeals group was relocated to the area previously occupied by the Law and Motion and Master Calendar group. These new locations allowed more efficient layouts for both groups, and placed them outside of the mainstream of filing and counter activities that were not essential to their activities.
- The Law and Motion and Master Calendar section was moved to the area currently occupied by the Microfilm section, where an improved layout could be achieved and where there would be adequate space for expansion.
- The Microfilm section was moved to the area currently occupied by the Probate section. In this location the equipment and personnel could be arranged in a manner that would allow the work to flow through the section's processing functions without the necessity of backtracking and duplicative handling. This area also provided adequate room for future storage areas and for the placement of additional equipment presently on order. The new location for the Microfilm section also eliminated glare problems.
- Moving the Document Register section from the east side of the room to the rear of the files placed the operations out of the flow of traffic to the offices and lounge area. In addition, the noise associated with the function was better contained in the new location.
- The entire operation of the Probate Division was moved from the area because there was not enough space in the area to accommodate all existing sections. The Probate function was less related to the filing function than the other sections.
- Relocation of personnel serving the public counter allowed the mechanized files to be optimally located without substantially changing the efficiency of their work.

The planning of court facilities so as to ensure the efficient movement of persons and documents is closely linked to the design of the work methods that are used. The next chapter discusses principles for use in analyzing and designing court work methods.

CHAPTER V. WORK SIMPLIFICATION AND METHODS IMPROVEMENT

The objective of work simplification and methods improvement in the courts is to reduce idle time, improve the efficiency with which work is performed, reduce the effort required on the part of court employees to accomplish the work, and to improve the quality of work. Work simplification is *not* intended to trivialize the work and should not result in work environments that employees consider to be degrading.

Work simplification in the courts may be accomplished in different ways, ranging from simple rearrangements of the work place to the introduction of mechanical filing and document moving devices. Computer automation is many times the best way to improve work methods, but non-computer alternatives should always be explored first.

Over the years, a number of principles of work simplification have been developed that are applicable in the courts. These principles must be applied in the context of the specific job that is being performed since they are very general in nature. Nevertheless, by keeping them in mind, many changes may be made that will improve productivity and efficiency while reducing the effort on the part of court employees.

A. Symptoms of Problems

Signs of problems in work methods in the courts include the following:

- *Excessive walking:* indicating a need for simplification of the work flow and possibly a more efficient floor plan layout.
- *Excessive talking:* indicating a need for a better floor plan arrangement, partitions, or possibly sight supervision.
- *Extensive hand copying or retranscription of documents:* indicating the need for photocopying equipment, an extra carbon copy, or duplicating equipment.
- *High percentage of time spent in filing:* indicating a need for reorganization of the records or a centralization of the filing systems.
- *Peak loads, high unit costs, low individual productivity, unequal individual output within positions,* and *idle machines:* all being signs that improved scheduling is needed.
- *Low typing or keypunching production:* suggesting the need for forms redesign.
- *A very high volume of activity in unit record files such as punched cards or docket file folders:* indicating possible savings through the acquisition of automated files or by document handling devices.
- *Poor housekeeping:* dust on the furniture; waste paper on the floor; magazines, files, records and paper piled on tables, desks and tops of file cabinets; disordered file drawers; and records, papers and documents in desk drawers, are usually a good indication of poor quality work, reduced productivity, and a feeling of indifference among the clerical force.
- *Poor workplace layouts:* frequently-used materials, supplies, machines, and reference material not within reach, causing a waste of time and effort that can often be eliminated through a sensible rearrangement of the work place.

B. Analysis of Court Operations

The process of identifying methods improvements in the courts is assisted by answering a series of questions with regard to the way in which the work is being performed. These questions deal with the purpose of the operation, the utility of checking the quality of work, the type of material being used, the way the workplace is set up, and the logic with which operations are sequenced and performed.

The following is a series of questions that can be raised regarding many court operations as a first step in improving methods.

What is the purpose of the operation? The answer to this question may seem trivial, but the process of answering it may be very illuminating. For example, if inactive dockets are being carefully sorted into case numbers for filing but are rarely being retrieved,

it is possible that a complete sorting by case number could be replaced with a partial sorting into batches. In this case, the operation of completely sorting the files may be serving no real purpose.

Is the desired result actually accomplished by the operation? If the filing of records by case number is designed to ease retrieval of the records, but the requests are almost always initiated in terms of the defendant's last name, it would be better to file by defendant's last name at that point in the process.

Was the operation established to correct a problem or condition that is no longer in existence? Asking this question quite often leads to the discovery that copies of forms are being either thrown away or filed with no substantial further use because a procedure had been introduced that eliminated the need for the form.

Can the objective of the operation be accomplished in some other way? For example, if the objective of maintaining duplicate files is to ensure that the same information is available to two working groups, would an index or abstract rather than copies of the documents serve the needs of one of the groups?

Can the method of supplying material to the operation be improved? For example, if warrants alphabetized by the defendant's last name are being prepared and delivered to a group who must re-sort them by case number in order to match the copy of the warrant with the docket, could the warrants be organized by case number to start with?

Can the operation be eliminated by changing the sequence in which the operations are performed? This question can be particularly helpful when it is found that a batch of documents is being repeatedly re-sorted against different items of information on the document. By changing the order in which operations are performed, one or more of the sorts may be eliminated.

The sequencing and manner in which elements of operations are combined should be questioned. The following questions may be considered:

- Can the operations be more effectively combined with the operations that either precede or follow?
- Can part of the operation be more effectively performed separately?

What are the real quality inspection requirements? Time spent in checking for document completeness or accuracy must serve some useful purpose. It is always important to ask oneself, what if this item of information is incorrect? Will it make a difference in the outcome of the process or in meeting the objective of the process? If the item is incorrect, can it be corrected later, as needed, at an expense less than that of checking all documents to start with?

Is the material that is being used suitable for the intended purpose? Common examples of this problem include forms which are too long for the file folder or are printed on unnecessarily heavy stock. The size and construction of file jackets and file boxes used in open shelving file systems are also items that should be questioned.

Is there a less costly substitute material? This question applies to types and grades of paper that are being used as well as to fixtures and furniture.

Could the supplier perform additional work that would enhance the usefulness of the material? It is common to find information on forms in the courts that is being entered by hand and that could be preprinted on the form by the manufacturer.

Is the time consumed in moving materials within the court substantial in relation to the time spent working on them? If so, check to see that incoming and outgoing locations for documents are placed so that overall time spent in moving the documents is minimized. It is easier to have a messenger circulate through an office area than to have individual clerks repeatedly moving back and forth from a central mail point. Where continual movement of individual dockets or documents exists between two or more points, the use of conveyors or pneumatic tubes should be considered. Many times cart design can be improved, particularly in file areas, and files can be made portable if the materials are needed at various points during different times of the day or week.

Is the work organized and assigned to the employee properly? If the particular job involves matching documents, are all materials provided in the proper amounts so that repeated trips to obtain more materials are avoided? Delays and frequent clerk idle time are often signs of a need for improving the ways in which jobs are set up.

C. Some Principles for Designing the Individual Workplace in the Court

Because many clerical operations in the courts involve short, repetitive operations such as processing large batches of documents, it is important to pay careful attention to the arrangement of materials and the methods that are used in performing the task.

The following is a set of principles called "the principles of motion economy." They can be applied by all persons in the courts to both improve the efficiency and quality of the work and to reduce

fatigue of the clerk who is performing these types of operations.

- When working on a task which has short, repetitive elements, the two hands of the clerk should begin as well as end a set of motions simultaneously. This adds balance to the operation and reduces fatigue if the operation is being performed over extended periods of time.
- The motions of the hands and arms should be made in opposite and symmetrical directions, again to add balance and reduce fatigue.
- Hand and body motions may be classified as to whether they involve finger motions only; fingers and wrists; fingers, wrists, and forearms, and so forth. When designing repetitive clerical operations, attempt to formulate a method which uses the lowest classifications of motions.
- Another classification of motions is whether they are "ballistic" or "controlled." Ballistic motions, such as occur in tossing an object, result in less fatigue.
- Arrange the workplace to permit an easy and natural rhythm.
- Attempt to design the work in such a way as to minimize the number of eye fixations and the distance the eye must travel between fixations.
- Locate documents to be worked on and containers to be used for their removal as close to the point of use by the clerk as possible. Work located much beyond 30 inches from the body of the clerk requires shifting the body to reach it. If all materials can be located within an area that can be reached without moving the body, then greater efficiency and reduced fatigue will result.
- Locate the documents and other materials to be used in the operation in such a way that the location corresponds to the sequence in which they will be used.
- Be sure that illumination is adequate and that there is not excessive glare. Both of these factors are extremely important in efficiently executing repetitive short-cycled clerical operations.
- When repetitive clerical tasks are being performed for extended periods of time, design the work station so that the clerk may alternate between a standing and sitting position to reduce fatigue. This can be accomplished by performing the work at a counter with a stool rather than at a normal desk.
- A well-designed adjustable chair at the proper height and one which aids in proper posture is important in reducing fatigue.
- Introduce simple automatic devices such as mechanical staplers, collating equipment and so forth, when repeated use of these devices is indicated.
- The time and effort to accomplish a clerical task can sometimes be reduced by batching elements of a job. For instance, when opening a batch of envelopes, it may be easier and quicker to open all the envelopes first before removing the contents.

Recognizing situations where the above principles may be applied and learning how to apply them is often a simple matter of common sense and staying alert to what is going on. By keeping these principles in mind, the opportunities to use them will readily present themselves in the courts.

Employees working on repetitive, short clerical tasks need to be instructed in the proper way to set up the workplace and the proper way to proceed with the task. It cannot be assumed that they will naturally find the best and least fatiguing way to do the job.

Moveover, where supervision shows an interest in adopting work methods that minimize fatigue, promote good quality, and save time, the employees will tend to develop and use methods that meet these same goals.

D. Examples of the Application of the Principles of Methods Improvement

The following paragraphs provide some examples of the application of the principles described above. The examples have been selected to cover applications that require neither the purchase of expensive equipment nor major changes in the way that work was being performed.

1. *Improved selection of materials.* The inactive case record storage area of a municipal court was replacing 1000 file boxes per year due to the front lip of the boxes being torn by repeated removal from the storage shelving. New boxes cost $1.09 each, and setting up a new box and transferring the contents took about 5 minutes of an employee's time. The use of special binding tape allowed the boxes to be repaired rather than discarded, and the time necessary to repair the boxes was approximately the same as that for setting up a new box. It was also found that, for an additional 9¢ per box, stronger boxes could be ordered. Under the new

system, older boxes are being repaired where possible at a saving of over $800 per year in material cost (see Exhibit 5.1), and all new orders for boxes specify the strengthened types. In addition, nearly 15 days of employee time per year is being saved by the new procedure. This method improvement resulted from questioning the appropriateness of the materials used in the operation.

2. *Change in numbering system to ease the problem of locating docket files.* The filing of traffic citation dockets was set up in boxes containing groups of 150 dockets, thereby utilizing the capacity of existing file boxes. Thus, a typical sequence of boxes was numbered 400500, 400650, 400800, 400950, 401050, and so forth. By purchasing smaller file boxes and numbering them in even segments of 100, i.e. 400500, 400600, 400700, etc., the time to file and retrieve dockets was reduced by 5%, which easily paid for the increased number of boxes required and slightly decreased filing space. The change is shown in Exhibit 5.2. The improvement in efficiency was due to reducing the number of eye fixations necessary to locate the proper file box. In addition, filing errors were reduced.

3. *Retrieval and purging of docket files aided by color coding of case categories.* Traffic citation dockets were filed by case number regardless of the nature of the offense. The retrieval of the documents, however, is influenced by the seriousness of the case (driving while intoxicated, hit and run, driving without a license, etc.). In addition, the legal requirements for retention of the file is also influenced by these same factors. By color coding the docket sheet differently for each category of offenses, both the retrieval and the purging of dockets was speeded and made more accurate. The color coding allows the clerk to scan a group of documents while searching for a particular type, thereby eliminating the handling of many dockets.

4. *Simple shelf to aid in handling of documents in file areas.* Very inexpensive open shelving was utilized for filing of inactive records in one municipal court. In order to ease the problem of handling file folders and file boxes, a simple masonite shelf was inserted as shown in Exhibit 5.4. This simple change in the nature of the work station reduced the filing and retrieval time by several seconds, which, when multiplied by the thousands of filings and retrievals performed per year, provided substantial savings in time as well as reduced the effort to perform the operation. The shelf allowed the clerk to use both hands while filing and retrieving documents.

Exhibit 5.1 *Improved Selection of Materials*

The selection of proper materials is important in maintaining productivity. The boxes shown in the photograph were being replaced by new boxes at a cost of over $1.00 each. For a slight additional cost, reinforced boxes were purchased and old boxes repaired. Note the simple fixture used to steady the box during repair, leaving both hands free to apply the reinforcing tape.

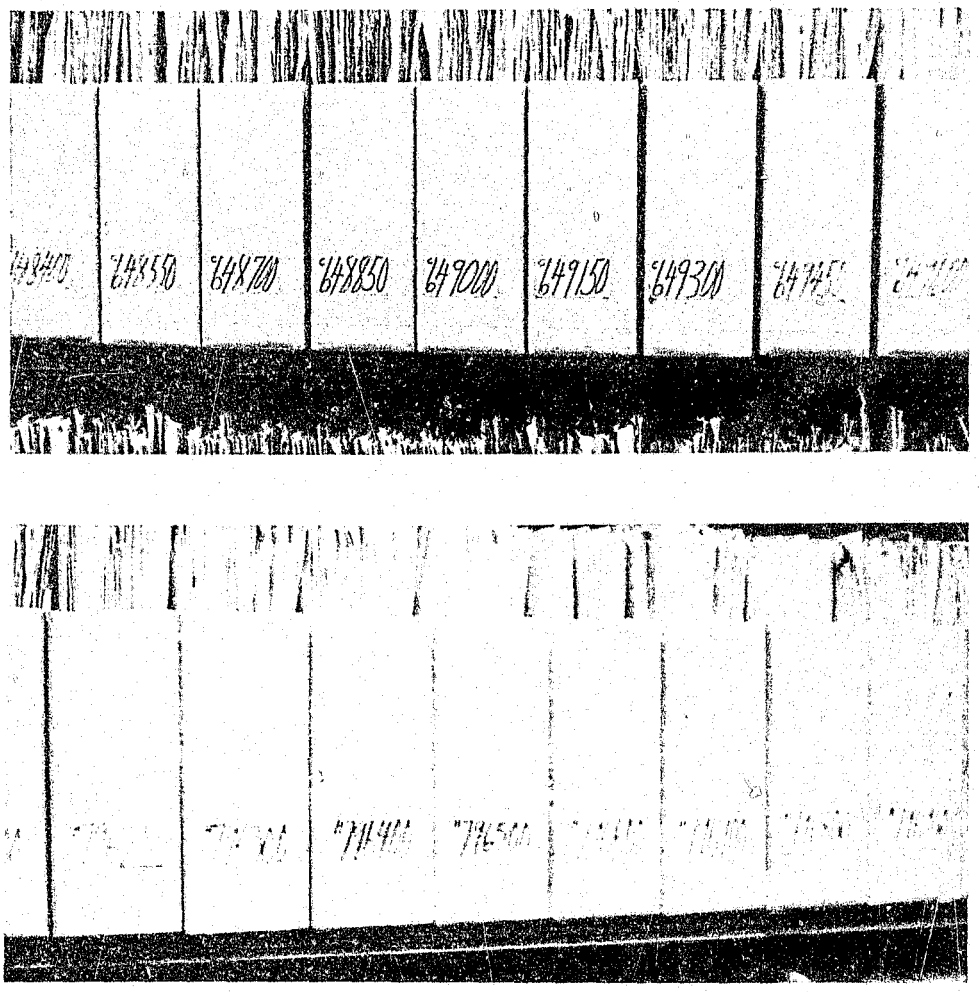


Exhibit 5.2 *Change in Numbering System*

The open shelving file boxes shown at the top were numbered in intervals of 150. By changing the interval to 100, both filing time and errors were reduced.

5. *Moving the current file boxes to keep active records close to the point of use.* In one particular court, parking citations were being filed in open shelving, and virtually all retrieval called for recent citations. By moving the file boxes along an extended lateral shelf on the wall, the current boxes were kept close to the clerk who performed the retrieval and minimized the effort needed to reorganize the file. Significant time savings resulted from reducing walking time between the clerk's desk and the files.

6. *Initial aisle widths established to accommodate future expansion.* By establishing the aisle widths in a large inactive records storage area to correspond exactly with the width of new shelving, the new shelving could be added without extensive rearrangement of the area.

7. *Use of partial sorting when probability of retrieval is low.* One court was taking nearly five hours of clerk time per day to file approximately 500 traffic citation payment records. The records were filed by the citation number—a six digit number. On the average, there were about 25 requests per day for retrieval of payment records, and it was taking about 50 minutes per day to retrieve the records. Is this filing policy the best? One alternative for the records section was to sort and batch the documents by only the ten's digit, the hundred's digit, or even the thousand's digit, and then search within these ranges when a retrieval was requested for a certain record.

Exhibit 5.6 shows the results of an analysis of the times expected under each alternative. As the records were batched in larger groups, the filing time

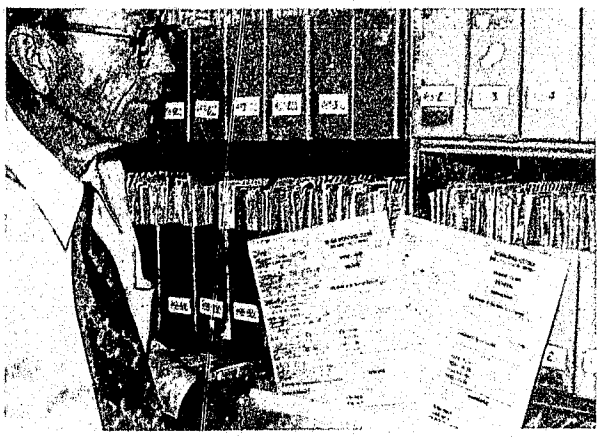


Exhibit 5.3 *Color-Coded Dockets*

By printing similar forms on different colored paper, retrieval and purging of files is made faster and more accurate. The traffic citation dockets shown above are color coded yellow or orange according to the legal requirements for retention of the file.

was reduced but the retrieval time increased. As is shown in Exhibit 5.6, the least overall time will be spent by the records group if they sort only by the hundred's digit, thereby saving 165 minutes per day. However, the persons requesting the information must wait longer as the clerk's search time is increased. The answer to which policy is best would lie in an evaluation of the cost of waiting time for the persons who were waiting for the information. Since this waiting time occasionally involved the general public, an assignment of cost to the waiting time would involve valuing the public's time as well as employee's time. In this case, it was decided that batching in groups of 10 was the best policy. This method improvement resulted from questioning the purpose of the operation.

8. *Changing of case number position to ease handling*. By moving the case number to the extreme right-hand margin of the warrant form, a number of small handling operations were eliminated in the processing of the form. Reduced errors and increased

Exhibit 5.4 *Open Shelving*

In the court file area shown in the photograph, an inexpensive shelf was inserted at various locations to allow the clerk to use both hands for the filing and retrieval of documents. The prior method is shown at the right.

Exhibit 5.5 *Work Station Shelving*

The clerk shown in the photograph is constantly filing and retrieving parking complaints received from the dumbwaiter behind her desk. By locating the most recent complaints immediately adjoining her desk, movement away from her desk is eliminated.

sorting and filing speeds were further achieved by placing a space between groups of digits. Both of these changes are illustrated in Exhibit 5.7. Together, these changes in forms design saved over one month of employee time per year. By moving the case number to the right-hand margin, a number of small finger and hand motions were eliminated in searching for warrants once they were batched together. By separating the six-digit number into two groupings of digits, the number of eye fixations necessary to identify the case number was reduced.

9. *Determining optimal steps for locating lost documents.* By experience, over a period of months and years, records clerks learn where to look when a docket or other file is not in its proper place. Unfortunately, the reason for the "lost" record can be due to a variety of factors such as it being removed without an out-card left, it having been misfiled, or it simply not having been sent to the records group for filing in the first place. Many times there are clues as to what might have happened to the document based on the spelling of a defendant's name, case numbers that lend themselves to transposition errors, typical movement of docket files for certain types of cases, and so forth. While acknowledging the usefulness of clues as to what might have happened to the records, one court has established a systematic procedure for tracking down a document. This procedure is outlined in Exhibit 5.8, and is particularly useful for new clerks. The idea behind the procedure is that there is an optimal set of steps to take when looking for a lost document, and if these steps are taken the document will be found with both the minimum amount of delay and search time.

The dockets are filed by the case number, which is a six-digit number preceded by a letter identifying the category of the action, i.e., M 123456 would identify a docket for a misdemeanor. The procedure shown in Exhibit 5.8 was adopted on the basis that in the absense of clues, the step-by-step procedure shown would locate the document in the minimum amount of time.

This method improvement was based on questioning the sequence in which operations are performed.

10. *Repeated sorting and re-sorting of the same set of documents.* Where the same batch of documents is repeatedly sorted and re-sorted, a review of the overall process is in order. It is usually necessary to track the documents through several departments. In one municipal court, parking complaints were received daily from the city attorney's office where the complaints were first assigned a complaint number and then sorted alphabetically by the defendant's last name in order to enter registered vehicle owner information. Before being sent to the court, the complaints were re-sorted, by complaint number. After receipt by the court, the complaints were re-sorted according to defendant's last name and held in the traffic section of the municipal court for payment by date of appearance. If the complaints were not answered, they were then re-sorted into numerical order by complaint number for purposes

Exhibit 5.6. *Analysis of Alternative Citation Filing Policies*

System	Documents Filed		Documents Retrieved		
	Number Filed Per Day	Time Per Day to File	Number Retrieved Per Day	Time Per Day to Retrieve	Total Time Per Day in Both Filing & Retrieving
File by all digits	500	300 minutes	25	50 minutes	350 minutes
File by tens digit	500	120 minutes	25	90 minutes	210 minutes
File by hundreds digit	500	60 minutes	25	125 minutes	185 minutes
File by thousands digit	500	30 minutes	25	250 minutes	280 minutes

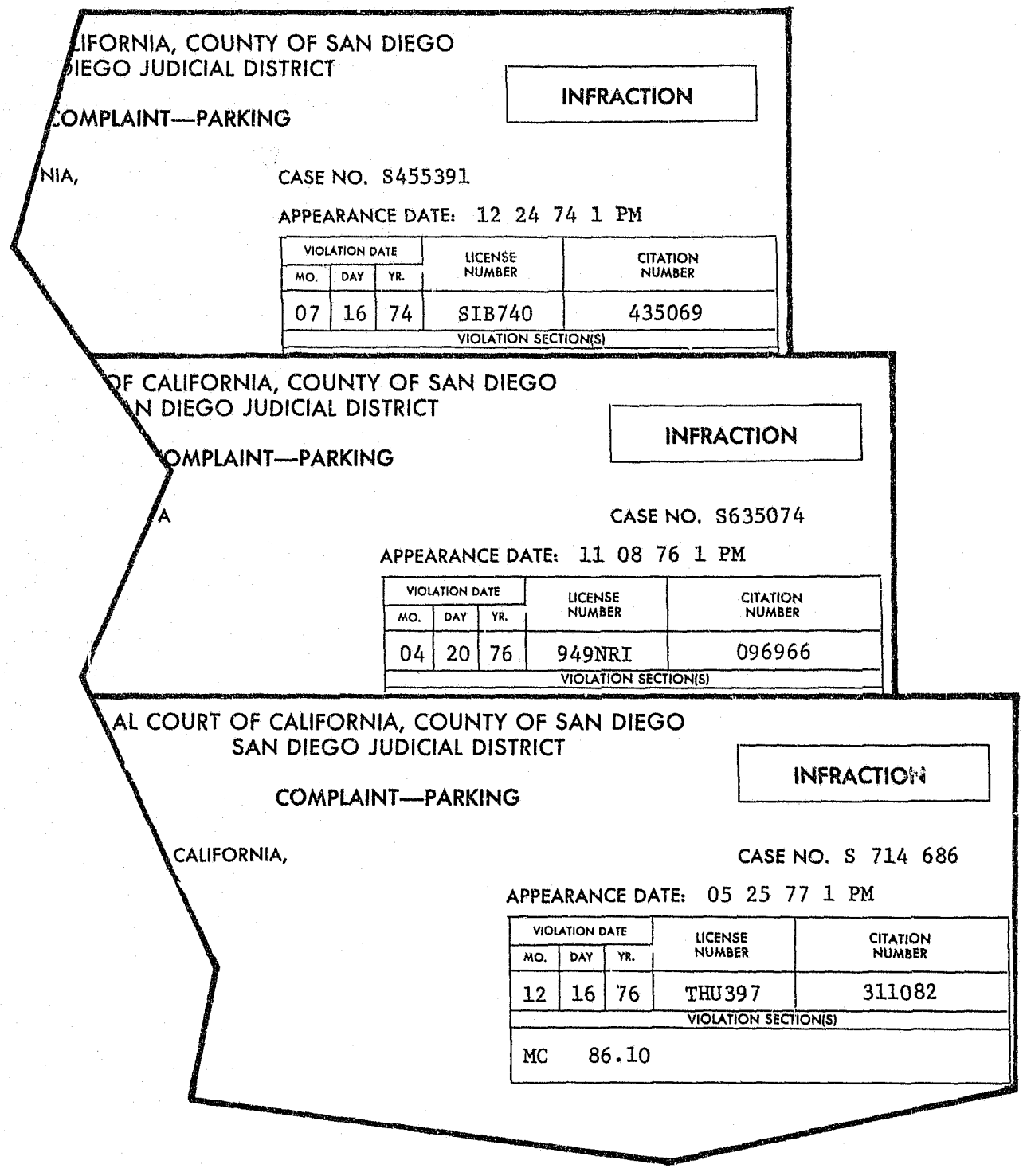


Exhibit 5.7 *Position of Case Number on Form*

In the form shown at the top, the case number is indented over one inch from the right-hand side of the form. By moving the case number nearer the edge of the form (as shown in the middle copy), the time to sort the forms is reduced. By separating the 6-digit case number (as shown in the bottom copy), the filing and retrieval time as well as filing errors were further reduced.

Exhibit 5.8. *Misfiled Case Check-Off List*

Below, enter the case number and defendant's full name. As each step is completed, enter that date of completion.

Case Number _____ Defendant's Name _____

Step	What to Do	Date Completed
1	Check with supervisor for any special instructions	
2	Put out-card in file showing that search is in progress	
3	Check all cases in file box where document should be located	
4	Check computer listing to verify that case number and defendant name match	
5	Check other categories of files using same six digit number, e.g., if missing file is M 123456, check F 123456, J 123456, etc.	
6	Check file boxes immediately before and after the file box where the document should be located	
7	Check all combinations of first three digits using the same last three digits, e.g., if missing file is M 123456, check M 132456, M 213456, M 231456, etc.	
8	Check all file locations that have same first three digits	

of issuing a warrant, which was controlled by complaint number rather than defendant's last name. After the warrant was prepared, the complaints were again sorted back into alphabetical order for filing in the active warrant section of the court.

While there are a number of approaches that could have been considered for improving this process, one involved only a minor change in the ordering of the operations. This change was to have the city attorney's office alphabetize the complaints before assigning the complaint number, and then sequentially assign the complaint numbers to the alphabetized batch of complaints for the day. In this way the batch was simultaneously in both alphabetical order and numeric order throughout the remaining steps, and no further sorting was required. The key to this improvement was in recognizing that the order of the operations was important and that only one alphabetical sorting was required if it preceded assignment of complaint numbers. Two sortings were eliminated and no additional elements of work introduced. The savings in sorting costs exceeded $3000 per year.

In situations of this nature one is tempted to jump to the conclusion that computer indices or manual cross files are required, when a perfectly satisfactory answer lies in a simple rearrangement of the sequence of the operations.

11. *Combining information on one stamp.* Many court forms have standard phrases, dates, facsimile signatures, and similar items hand stamped. It is not uncommon to find the same two, three, or even four separate stamps being used identically on each document in a batch. Where this is the case, a stamp that combines the information should be designed and used. Where minute orders and similar documents are typed, a number of courts around the country have investigated and adopted word processing units for retrieval and insertion of standard phrases.

12. *Workplace arrangement.* Exhibit 5.9 shows a workplace that is being used to check and sort misdemeanor citations. In the first arrangement, it takes approximately 15 minutes to complete 100 items. In the second arrangement, it takes 10 minutes to complete the same 100 items. Note that this

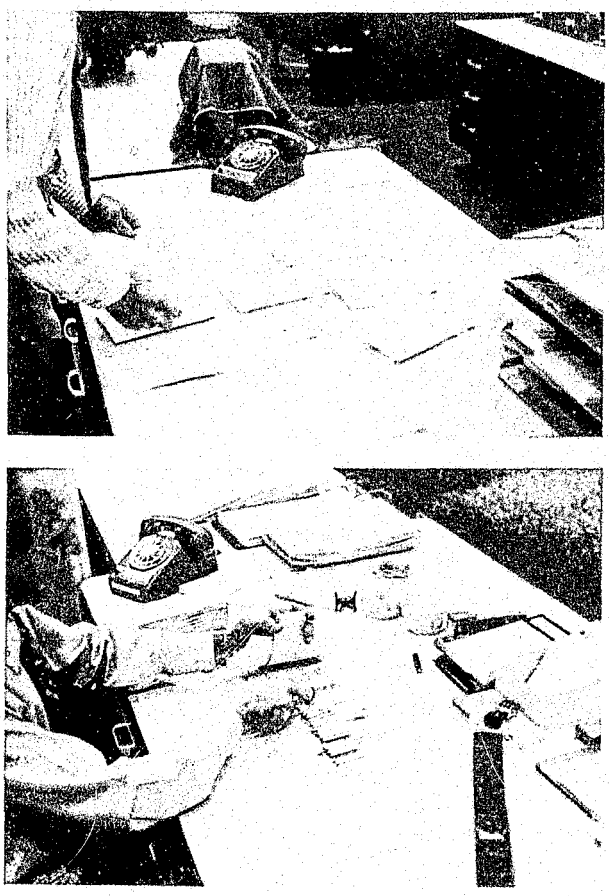


Exhibit 5.9 *Workplace Rearrangement*

The arrangement of the workplace is important in efficiently performing repetitive clerical tasks. The arrangement shown at the top will take approximately 50% more time to execute than that shown at the bottom.

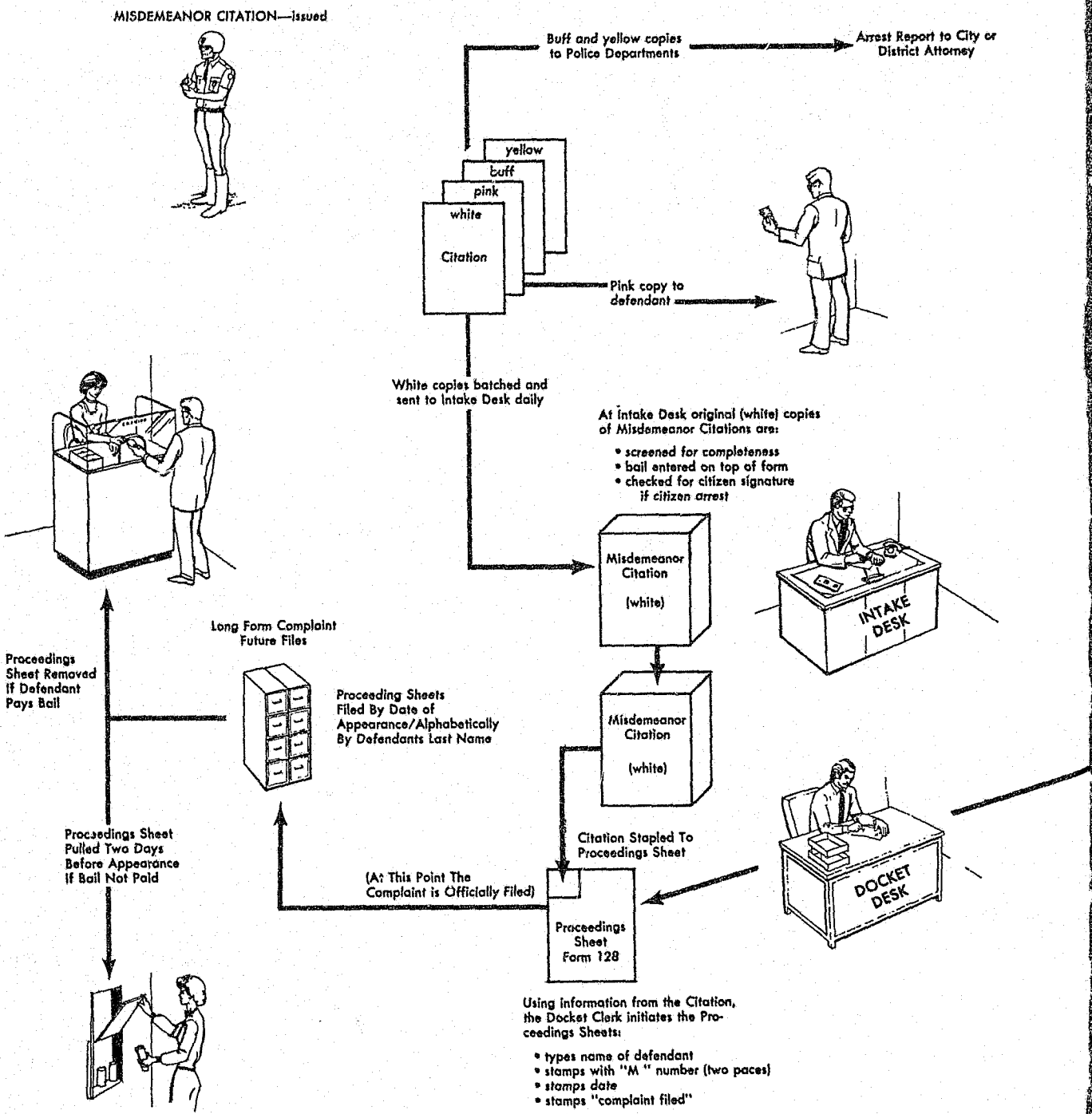
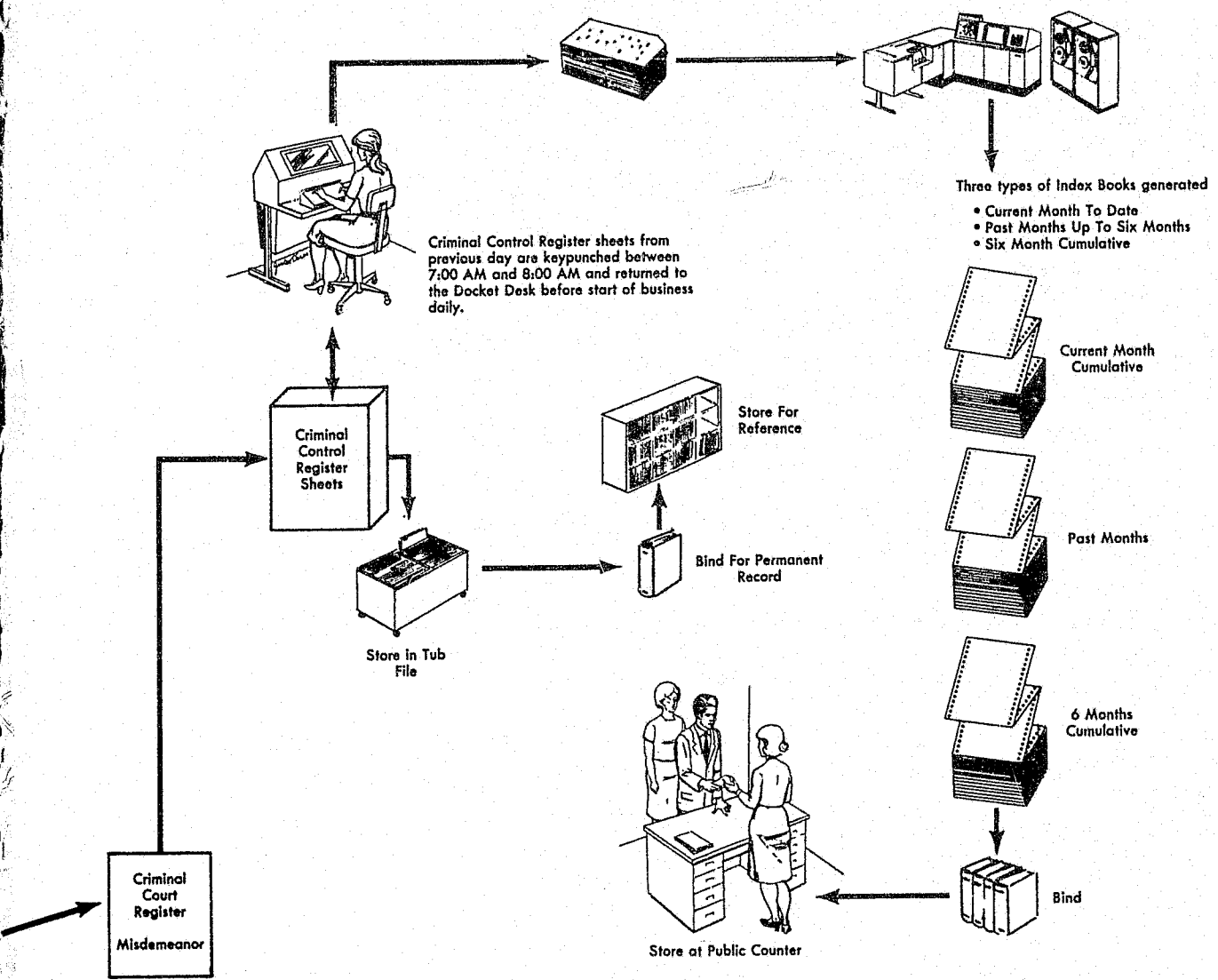
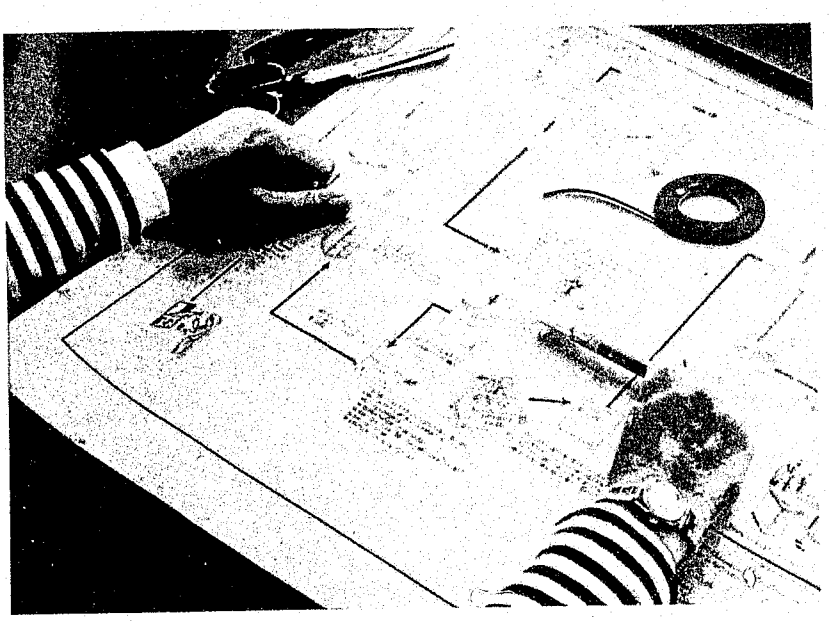


Exhibit 5.10 *"Pictogram" Flow Chart*

Flow charts of the handling of forms and files are useful in operations analysis studies. The flow chart shown above is called a "pictogram" and can be easily made using templates. This type of flow chart contains all the information usually found on more technical types of charts, and has the advantage of allowing persons to visualize the process rather than dealing with abstract symbols. This type of chart is much more useful when explaining systems and procedures to new employees, judges, and persons outside the court.


Three types of Index Books generated
• Current Month To Date
• Past Months Up To Six Months
• Six Month Cumulative
Criminal Control Register sheets from previous day are keypunched between 7:00 AM and 8:00 AM and returned to the Docket Desk before start of business daily.
Current Month Cumulative
Past Months
6 Months Cumulative
Bind
Store at Public Counter
Store For Reference
Bind For Permanent Record
Store in Tub File
Criminal Control Register Sheets
Criminal Court Register
Misdemeanor
Docket Clerk enters name of defendant and violation; prenumbers sheets with "M" number. All receipts for day must be processed before close of business.



saving was not accomplished by the purchase of any special machines or fixtures—simply by rearranging the workplace to minimize the number of motions and distances reached.

The above examples have illustrated methods improvements that were accomplished with very little expenditure for equipment, without the use of computers, and with little change in the overall process. They were achieved by a careful and systematic application of the basic principles of operations analysis: Can the form be eliminated? Can the sequence of operations be changed? Can the number of motions be reduced? and so forth.

Methods improvements can also be achieved by:

- Installing document conveyors where a large amount of time is spent traveling between locations
- Use of automated files; and
- Relocating files to a closer proximity of the clerks who use them

E. Methods Improvements Through Computers and Data Processing

Computer systems in the courts are no longer a novelty. Just about every possible court application seems to have been computerized in some jurisdictions, and many courts have their own computer and data processing staff. Examples of significant cost savings abound. However, the approach in many jurisdictions seems ad hoc. Perceived needs are automated without reference to an established plan.

When using computers for methods improvement, it is important to keep the following points in mind.

- Is the problem one that really can be solved by a simple change in manual methods?
- Is the proposed computer system the most cost-effective after taking into account all the indirect expenses?
- Is there provision for an independent audit scheme to periodically verify the accuracy of the system?
- Is there provision for correction of errors, including subsequent computations or decisions that may have resulted from such errors?
- Does the system route data to the proper persons and places?
- Are there adequate provisions for security and privacy?
- Are the printouts and displays designed to provide a high degree of readability?
- Is there provision for flexible inquiry and intervention in the normal routine to provide for unforeseen needs?
- Can the system be easily modified as needs change, and is the system designed on a modular basis?
- Will the court have its own staff for programming changes and, if not, how will changes be made in the future?
- Does the implementation plan provide for parallel operation at the outset and provide test criteria for the termination of parallel operation?
- Is there provision for thorough documentation, both for management and for new programmers?

Overall, the process of improving the productivity of court operations can be summarized in the following steps. First, question everything about the operation to clearly establish the purpose and objectives of the operation. Next, eliminate the unnecessary work, change the sequence of operations, and combine steps in the process. Finally, simplify the way in which the necessary operations are performed by rearranging the workplace, introducing simple labor saving devices, and by automation when it can be financially justified.

CHAPTER 6. SUMMARY

Productivity improvement is of concern to the court administrator due to the simultaneous pressures of limited resources and increased demands for services. Moreover, the public and its elected officials are increasingly expecting productivity improvement in local government as a way of mitigating adverse national economic problems.

This book has briefly touched on several of the concepts and techniques for productivity improvement in the courts, which can be referred to as the industrial engineering approach. These techniques have been widely applied in private industry and in other governmental areas for many years. They include the measurement and reporting of labor efficiency for better identifying productivity improvement opportunities, the more efficient layout of facilities, and the application of principles of operations analysis for reducing the time and effort to perform work tasks as well as improving the quality of the work.

The techniques of work measurement such as work sampling and the use of standard data can provide the labor standards needed for understanding the current efficiency of the court as well as improving the ability of the court administrator and supervisors to schedule and plan work. An understanding of the relative advantages and disadvantages of these techniques is essential in conducting productivity improvement programs.

Many of the principles of operations analysis and motion economy that have been presented may be readily applied by all personnel in the courts and require only an alertness to opportunities rather than extensive technical training. Moreover, they do not require the purchase of expensive equipment nor do they require expensive studies. These types of improvements result from a systematic questioning of the purpose of operations and how they may be eliminated, combined and simplified.

While the opportunities to use these techniques abound in the courts, there are other approaches to productivity improvement that should be considered by the court administrator.

Which approach should be used by the court administrator? Systems analysis, the application of theories from the behavioral sciences, and computer automation are some of the alternatives. Which approach or combination of approaches will work best is dependent not only on the specific problems that are to be solved but also on the resources and background of those responsible for supervision and management in the court. A point to be emphasized is that the adoption of one specific philosophy to the exclusion of the others is likely to result in missed opportunities.

The attractiveness of the industrial engineering approach is that there are many problems in efficiency in the courts that can be solved by the application of basic principles of work simplification and methods improvement. In addition, the techniques of work measurement described in Chapter III can provide the essential ingredient of steady and long-term improvements in court productivity. This ingredient is the ability to accurately measure and report labor efficiency.

An awareness of the basic principles of methods improvement is important. As discussed and illustrated in Chapter V, many methods changes in the courts can be conceived and implemented without the purchase of expensive equipment, without major rearrangement of facilities, and without the use of computers. An awareness of the time-tested principles of work simplification and operations analysis greatly increases the ability of both supervision and employees to detect opportunities and to conceive changes that will reduce the time to perform operations, make them easier to perform, and improve the quality with which they are performed. While computer automation, sophisticated materials handling equipment, automated files, and other mechanized and automated approaches are important and should be considered, there is no substitute for a systematic questioning of the purpose, sequence, and manual work methods that are used in court operations.

Work measurement projects must be approached cautiously. The work measurement techniques discussed in Chapter III all have a single purpose. This purpose is to produce an estimate of the time needed

to perform a task in the court. The cost of these techniques and the sophistication needed to apply them are directly related to the accuracy or precision of the resulting time standard.

A time standard, regardless of how obtained, is essential for implementing systems of labor efficiency reporting, for improved scheduling, and for analyzing the implications of proposed methods changes. Nevertheless, it is extremely important that the cost of the approach, as well as the degree to which it satisfies information needs, be carefully analyzed and justified.

Thus, if it is unlikely that monthly labor productivity reporting will be used by supervision for productivity improvement purposes, it does not make sense to spend the money to develop the types of standards needed to make such a system work. As with all management information systems, the information produced must be useful. It is also important to recognize that labor productivity reporting systems must be maintained by updating of standards as work methods and other conditions change. In local government it is easy to find examples of work measurement systems that were installed at substantial expense only to be worthless in a short time because there were no resources to maintain the systems.

Finally, labor productivity systems must be implemented with a great deal of tact on the part of management and first-line supervision. The systems, as valuable as they are for productivity improvement, will fail if they are not implemented in a constructive manner.

Measuring performance is the key to improving it. Within local government today there is a great deal of confusion regarding the respective purposes and requirements of systems such as MBO (management by objectives), PPBS (program planning and budgeting systems), ZBD (zero base budgeting), the use of benefit-cost ratios, cost-effectiveness studies and so forth. There is also confusion as to the meaning and usefulness of basic performance measures. In the courts these are "workloads," "unit costs," measures of "effectiveness," "labor productivity indices," and "labor efficiency." Each of these measures of performance has different uses and reflects different operating phenomena.

What these measures do and how they reflect changes in productivity is widely misunderstood. This misunderstanding leads to the adoption of systems that do not meet the needs of management or supervision. In particular, it is critical to have a clear understanding of the difference between labor efficiency, labor productivity indices, and unit costs. All are useful in productivity improvement in the courts, but they serve distinctly different decision-making and supervisory needs, and have different data requirements.

Resources must be sufficient for seeing projects through. A common mistake in the use of traditional industrial engineering techniques for productivity improvement is either to have underestimated or failed to plan for the follow-up work that is required to implement systems, install procedures, and work the bugs out of changes in work methods. Anticipating the costs of complete implementation is particularly critical when consultants are used. The symptoms of failing to plan ahead include report recommendations that have not been implemented or systems that have become useless or are ignored because they have not been maintained. It is also important that there are resources available for training of supervision and employees in new methods.

Employees must be rewarded for productivity improvement. Many productivity improvement efforts fail because employees are penalized rather than rewarded for improved productivity. Innovative approaches to this problem are vitally needed in government. Where it is not possible to reward employees for productivity improvement by increased pay, time off, or enlarged job responsibilities, other forms of recognition must be provided.

In any event, penalizing of the work force by job insecurity, whether real or perceived, is an unacceptable condition if productivity gains are actually to be achieved. It has been amply demonstrated since the turn of the century that true gains in productivity only accompany policies that reward employees for these gains.

GLOSSARY

Allowed Hours: See standard time.

Benefit-Cost Ratios: A measure of the attractiveness of alternative processes, procedures, or types of equipment constructed by quantitatively estimating the benefits and dividing this by a quantitative estimate of the costs. A benefit-cost ratio greater than 1.0 implies that the alternative produces more benefits than costs. Benefit-cost ratios may *not* generally be used to rank more than two alternatives, which is a common mistake in their application in local government.

Cost Effectiveness Studies: A process for choosing between alternative process, procedures, or types of equipment in which one first establishes a minimal level of acceptable effectiveness and then attempts to determine the alternative that meets the minimum level of effectiveness at the minimum cost.

Daywork: Refers to a wage payment system in which the employee is paid by the number of hours worked rather than by the amount of work produced.

Delay Allowance: An allowance applied to the normal time to compensate for delays in the performance of work, which are inherent in the job and are outside of the employee's control. Typical examples in the court include waiting for persons to arrive at public counters, getting supplies, time spent searching for misfiled documents, and so forth. (See Normal Time, Standard Time.)

Earned Hours: The time that it would have taken to perform the work under normal conditions and normal performance based on the amount of work produced and the standard time for producing the work. For example, if the standard time to file a parking complaint is 0.01 hours per complaint and 500 complaints were filed, then the *earned hours* would be calculated as $0.01 \times 500 = 5.0$ hours. Earned hours are used in calculating labor efficiency. (See Labor Efficiency and Standard Time.)

Ergonomics: The study of work tasks with an emphasis on minimizing the physiological cost of doing the work.

Fatigue Allowance: An allowance applied to the normal time to compensate for time spent overcoming fatigue. (See Normal Time, Standard Time.)

Human Factors Principles: Principles used in the design of work processes and operations (particularly those involving machines or equipment) based on fundamental knowledge of man's physical and mental characteristics. These principles are applied in the courts for designing facilities, choosing equipment, and for establishing work methods.

Labor Efficiency: The ratio of the time it should take to perform the work under normal conditions (earned hours) to the time it actually took. For example, if the earned hours associated with preparing a group of warrants is 4.0 hours and the time actually spent is 5.0 hours, then the *labor efficiency* would be calculated as $4.0/5.0 = .80$ or 80%. (See Earned Hours.)

Labor Productivity Index: The ratio of the amount of work produced to the hours of work used to produce. For example, if the clerical time spent to process 200 misdemeanor complaints is 400 hours, then the labor productivity index would be $200/400 = 0.5$ complaints per hour. The difference between *labor productivity* and *labor efficiency* is that, in the case of labor efficiency, the amount of work produced is measured in terms of how many hours it should have taken to do the work. (See Labor Efficiency, Earned Hours.)

Labor Standard: See Standard Time.

Leveling: See Performance Rating.

Normal Time: The time required by a properly trained and qualified employee to perform a job using a specified procedure and working at a normal pace.

Operations Analysis: The study of all factors related to the way operations are performed for purposes of reducing the time or improving the quality of the work. In the courts, *operations analysis* will normally involve questioning the sequence, the need, and the purpose of operations along with the degree to which materials are appropriate and whether operations can be combined or eliminated by redesigning the process.

Performance Rating: A process whereby an analyst attempts to take into account the pace at which an operation was being performed, so as to adjust the ti~ that was observed to obtain the time it should take at a normal level of performance. For example, if a clerk was observed to be preparing 100 warrants for failure to appear in 10 hours, then the observed time would be 0.10 hours per warrant. If the analyst felt that the employee being observed was working at a pace that was, say, 10% faster than normal, he would *performance rate* the employee at 110%, and the observed time of 0.10 hours per warrant would be adjusted to 0.11 hours per warrant for purposes of obtaining the *normal time*. (See Normal Time.)

Personal Allowance: An allowance applied to the normal time to compensate for time spent by the employee on breaks and attending to personal needs. (See Normal Time, Standard Time.)

Predetermined Motion Time Systems: A system of normal time values for performing basic hand and body motions such as reaching, gr..sping, standing, walking, and so forth. Predetermined motion time systems differ from standard data systems in that the latter are defined for small tasks rather than basic motions. Predetermined motion time systems are used in work measurement for establishing standard times. (See Standard Data, Work Measurement, Standard Time.)

Principles of Motion Economy: Principles for designing the layout of work stations and the manner in which materials are handled, so as to minimize the effort and time needed to perform the task. In the courts the principles of motion economy are applicable to short, repetitive clerical operations such as those encountered in the sorting, filing, checking, and preparation of documents.

Regression Analysis: In the area of work measurement, this refers to a statistical technique for estimating the standard time to perform a task, or group of tasks, by analyzing the historical times it has taken to perform these tasks in connection with the different characteristics of the work which was performed. (See Work Measurement.)

Self-administered Time Studies: A work measurement technique in which the person performing the work records the time taken to perform the work. A typical technique is one in which the employees record, at 15 minute intervals, what they are working on.

Standard Data: A collection of normal time values defined in a manner that allows them to be added together to provide an estimate of the time to do a task. Standard data systems typically have elements such as "remove file folder from file drawer," "use rubber stamp," and so forth. (See Work Measurement, Predetermined Motion Time Values.)

Time Study: Any work measurement technique in which the standard time is arrived at by measuring the actual time it takes in a sample of the tasks studied. However, the term *time study* is usually reserved for those situations in which an analyst uses a stopwatch or other timing device to precisely measure the beginning and end of elements of work. (See Work Measurement, Self-Administered Time Study.)

Standard Time: The time to perform a task by a properly trained and qualified employee with allowances for delays, personel needs, and fatigue. The *standard time* is arrived at by adjusting the normal time to compensate for fatigue, personal needs, and delays. (See Normal Time, Fatigue Allowances, Personal Allowances, Delay Allowances.)

Unit Cost: The amount of work produced divided by the cost of producing the work. Various types of unit costs may be constructed in the courts by including different types of costs, e.g., labor only, labor plus material, and so forth.

Work Measurement: A generic term referring to the use of one of several techniques, the purpose of which is to provide an estimate of the time to perform a task. (See Time Study, Work Sampling, Predetermined Time Standards, Standard Data.)

Work Sampling: A technique of work measurement in which a large number of instantaneous observations are made of the nature of work being performed. The instantaneous observations are converted to an estimate of the percentage of time spent on elemens of the processes or operations, which, in turn, can be used to estimate idle time and to establish a standard time.

Work Study: Refers to the application of principles and techniques of work measurement, methods improvement, and operations analysis for the purpose of improving the way in which operations and processes are conducted.

REFERENCES

All of the traditional industrial engineering techniques presented in this book are discussed in the following two handbooks, which are available in many libraries.

- Ireson, William Grant, and Grant, Eugene L., Eds. *Handbook of Industrial Engineering*. Englewood Cliffs, N.J.: Prentice-Hall, Inc.
- Maynard, H. B., Ed. *Industrial Engineering Handbook*. New York: McGraw-Hill.

In addition, many libraries have a good selection of books in the areas of work measurement, methods analysis and work simplification, and facilities planning. Several well-known texts in these fields that should be useful to the court administrator are as follows:

- Barnes, Ralph M. *Motion and Time Study—Design and Measurement of Work*. New York: John Wiley.
- Krick, Edward V. *Methods Engineering—Design and Measurement of Work Methods*. New York: John Wiley.
- Nadler, Gerald. *Work Design*. Homewood, Illinois: Richard D. Irwin, Inc.
- Reed, Ruddell Jr. *Plant Layout—Factors, Principles and Techniques*. Homewood, Illinois: Richard D. Irwin, Inc.

Two recent publications discussing facility planning in the courts are:

- Wong, Michael F. *Space Management in the Courts—Design Handbook*. Washington, D.C.: U.S. Government Printing Office, 1973.
- *The American Courthouse, Planning and Design for the Judicial Process*. Ann Arbor, Michigan: Edwards Bros., 1973.

A recent publication directed toward productivity measurement in the service industries and government is:

- Mundel, Marvin E. *Measuring and Enhancing the Productivity of Service and Government Organizations*. Tokyo: Asian Productivity Organization, 1975.

Most recent texts on industrial psychology discuss the topics of job enlargement and the role of employee motivation in improving productivity. One article on this subject that provides a good contrast in viewpoints is:

- Herzberg, Frederick. "One More Time: How Do You Motivate Employees?" *The Harvard Business Review*, January, 1968.

The systems approach and operations research in the public sector is discussed in a very useful fashion in:

- Churchman, C. West. *The Systems Approach*. New York: Delacorte Press, 1968.

and in the first few chapters of

- Drake, Alvin W., *et al.*, Eds. *Analysis of Public Systems*. Cambridge, Massachusetts: The MIT Press, 1972.

The use of computer automation in the courts along with some perspectives on methods improvement is available in:

- Adams, Eldridge. *Courts and Computers*. Chicago: The American Judicature Society, 1972.

Labor management relations in productivity programs and the need for employee participation are discussed in the following monograph:

- Fein, Mitchell. *Rational Approaches to Raising Productivity*. Norcross, Georgia: American Institute of Industrial Engineers, 1974.

The National Commission on Productivity and Work Quality has prepared a number of publications dealing with productivity improvement in State and local government. A complete list of their publications may be obtained by writing the Commission at 2000 M Street, Washington, D.C. 20036.

In particular, incentive systems in the public sector are discussed in:

- *Managing Human Resources in Local Government: A Survey of Employee Incentive Plans*. Washington, D.C.: The National Commission on Productivity, 1973.

Useful background information on productivity measurement in government can be obtained from:

- Hartry and Fiske. *Improving Productivity and Productivity Measurement in Local Government*. Washington, D.C.: U.S. Government Printing Office, 1972.

- *Measuring and Enhancing Productivity in the Federal Sector.* U.S. Civil Service Commission, General Accounting Office and Office of Management and the Budget, 1972.
- *Productivity in State and Local Government—The Wingspread Conference.* Washington, D.C.: National Commission on Productivity, July 1973.

Many examples of the analysis of work methods changes for improved productivity in the courts may be found in the reports of the Criminal Courts Technical Assistance Project of the American University. An index to these reports is available from Criminal Courts Technical Assistance Project, American University, 2139 Wisconsin Avenue, Washington, D.C. 20007.

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