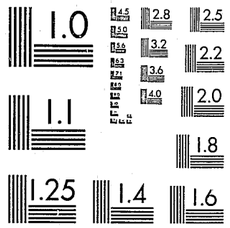

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Implementation of a Probation Management Information System in a Local Office

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THE LITERATURE about the implementation of computerized management information systems is replete with accounts of severe problems, often coupled with eventual implementation failure. (Zalkind, et al., 1979; Weimer 1980; Quinn, 1976; Harrell, 1981). This article is a report about an experimental implementation project establishing an inhouse computerized system in an urban probation office. The project proved successful, and the system has been incorporated into routine office procedures. However, there was rough sailing along the way; the usual problems of unreliable data and staff resistance were encountered and although these problems were expected, their tenacity and severity proved somewhat surprising. This article describes the system, its implementation, problems encountered, the project goals, and recommendations from our experience. It concludes with a review of the major lessons learned with the hope that other local offices and larger organizations embarking on similar projects will find our experiences useful in their planning.

Description of the System

Currently, case attribute data are collected monthly in the U.S. Probation Office, Washington, D. C., for all active cases (N=1,600) and the movement of inactive (N=350) cases is tracked. There are 14 items for each case that are coded by a Management Information and Research Section established for this project. These items are either unchanging attributes of the case (e.g., probation or parole case) or descriptions of case status changes during the month (e.g., opened, warrant issued, etc.). All monthly statistical reports are computed from this data, as well as many "tickler file" notices to probation officers.

In contrast, probation officers are asked to code monthly, for each of their cases, nine items concerned with behavior and adjustment during the month (e.g., violations, drug usage, employment status). There are two optional items that can be coded for special information needs such as counting the number of violent offenders in the caseload or the number of persons with mental health problems. These optional items offer great flexibility to data collection since just about any conceivable question about the nature of the caseload can be coded for a month or two, permitting caseload-wide surveys answering the question asked.

The officers receive computer-printed coding forms to complete each month. The data are entered into the computer from these sheets by the Management Information and Research Section.

Reports Produced

The following reports are routinely produced:

(1) Monthly statistics tabulating case openings, closings, transfers, etc., both office-wide and for each officer.

(2) Reports for each officer and his/her supervisor listing caseload supervision weights, persons unemployed, persons arrested, persons failing with special conditions, as well as persons with a drug history who are currently unemployed (a very high-risk category). Also, "tickler file" items listing all the various types of cases with reports on adjustment due in the next 90 days are produced.

(3) A report for the drug treatment unit giving the movement of cases in and out of that unit and tabulating employment, urine testing results, and intensity of supervision for all drug cases.

(4) An alphabetical list of their current cases for each officer and supervisor.

(5) Office-wide caseload frequency counts by the characteristics coded.

(6) An alphabetical listing of all cases and their current status for use by the Management Information and Research Section.

(7) A listing of caseload weights by officer for use in equalizing workload assignments.

(8) A list of cases scheduled to expire within the next month for verification by the Management Information and Research Section prior to closing them statistically.

Of equal importance with the monthly reports listed above is the capacity to answer any queries from administrators or line-staff for detailed information involving any of the attributes coded. Use of this data analysis ability has increased markedly as staff become more aware of this ability. We have an open-door policy regarding such queries, welcoming all of them. It is important to do this for at least one reason

other than the worthwhileness of the answers provided: The more staff finds the system personally useful, the more reliable their coding will become (Weimer, 1980).

Implementation of the System

Originally, the system was a manual one. Steven W. Reynolds, now a probation programs specialist with the Administrative Office of the U.S. Courts, designed the original data collection sheet and coding manual, then made arrangements with the Research Division, Federal Judicial Center, for computer access and programming assistance in order to pretest the possibility of implementing a one office management information system based on the existing manual system. The pretest indicated that the project was feasible, and a formal request for approval of the evaluative research project and assistance with keypunching, computer access, and software program design was made to the Research Division. The proposal was approved.

The evaluation project was in official existence for 2 years, from 1979 to 1981. Fortran software programs and System 1022 data base management programs manipulating the data and producing reports were designed in the Research Division. For 18 months, keypunching the coded data was done commercially and funded by the Research Division. Computer access and a typewriter terminal in the probation office were provided by the Research Division.

Because "batch" processing was used (i.e., submitting the program monthly for processing instead of making changes on-line as they occur), space on the coding forms was limited, so selection of data for coding required great care. Items were selected to ensure that statistical and "tickler-file" notices could be created and that information monitoring aspects of supervision important to office policy was collected. Consequently, some items of importance (e. g., type of offense) were consciously omitted.

A most necessary part of the implementation process was the Research Advisory Group, a "user's group" located in the probation office. This committee consisted of the deputy chief, a supervising probation officer, the research coordinator, and several line officers.[1] All were volunteers. This group approved the design of all aspects of the project and made numerous suggestions that were followed. Of particular importance was the sensitivity of line-officer members to the needs of line-officers for simplified coding and "tickler-file" information, and to the fear of line-officers that the administration would use the printouts in a heavy-handed, punitive manner. At their instigation, a "grace-period" when supervisors were not furnished with print-outs was established, an office policy against punitive supervision of line-officers with system information was fixed, and line staff's suspicions, complaints, and problems were better understood and coded with. Of equal importance, administrators on the committee were aware that accurate coding and concomitant success of the project depended upon quelling line-officers' suspicions so that policies aimed in that direction were steadfastly maintained by administrators even though no perceptible changes in line-officers' suspicions occurred for many, many months.

For the first year of the project, statistical reports were not tabulated by computer. After the first year, following a reliability study, changes simplifying the coding were made by eliminating inaccurate, unneeded items (e.g., telephone contacts) by adding items desired by staff (e.g., supervision quality, alcohol treatment status), and by reducing categories where feasible (e.g., employment status was reduced from eight to four categories). At the same time, programs were designed by the Research Division that would produce monthly statistics in official format.

It was far more difficult to implement statistical tabulations than to establish the project in the first place, and coding by officers was shut-down for three months in order to get the system functioning correctly. There were two major reasons for the problems at this point: One, user-agency staff did not fully understand the mechanics of the new programs. Two, the new programs were "tough," not permitting processing of data until each case beginning one month matched exactly, officer-by-officer and type-by-type, with each case at the end of the previous month; there are over 200 changes affecting these areas each month and a full understanding of how, when, and where most errors occur had to be learned from experience by operating personnel.[2] The necessity of changing user-agency statistical procedures, centralizing as much coding as possible, centralizing case information flow, and handling information by requiring paper backup (i.e., more, or, at least, new forms) became apparent, leading to the establishment of the Management Information and Research Section.

After 18 months, the user office took over responsibility for key-punching all data. Since trained

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[1]Later, when the Management Information and Research Section was formed, personnel from the section were also included in the committee.

[2]It was at this point in the project that problems occurring between two agencies involved peaked. These interorganization problems, which are common in the implementation of computer systems, are discussed in the next section under "interorganizational conflict."

personnel now existed, this step was easily accomplished.[3]

Once the system was operating again, implementation problems revolved around improving the management of case information flow, locating and reducing discrepanicies between file cards kept for each case and the computer file, and training of personnel in the newly established section. Personnel in the user-agency know how to use "fourth generation" user-oriented languages, SPSS (the Statistical Package for the Social Sciences) and the 1022 Data Base Management System (where all caseload data are maintained).

SPSS and 1022 enable the agency to do almost any research imaginable with the data, to answer all staff queries for specific information, and to produce specialized reports or lists of names. This ability for agency personnel to use the data to meet agency needs is essential for management information systems (Weimer, 1980).

At this point, the "case control system" is fully implemented as a routine and accepted part of office procedures. In addition, detailed sentencing information for local district court judges is now being produced bi-yearly at their request.[4] Important information not easily retrievable before a computer system existed is regularly discovered (e.g., persons with opiate-use histories who have a legitimate source of income have the same violation rates as other offenders). It is this ability to greatly expand the agency's knowledge base, coupled with the ability to accurately maintain caseload lists and to accurately tabulate statistics, that makes a computerized system so much more valuable than previous manual systems. The user-agency must place a great deal of effort in data collection and entry and in ensuring data quality. However, once the data are entered, even complicated data analyses and the production of finely tuned reports are usually quick and easy.

Problems Encountered

The major problems encountered were staff resistance, poor data quality, and inter-organizational conflict.

[3]It takes only about one man-day's work to enter all the monthly data from probation officers on 2,000 cases. Other changes, such as openings and closings of cases, are entered throughout the month as they occur.

[4]This was possible to implement fairly easily because a "1022" program designed for the U.S. District Court for the Eastern District of Pennsylvania was available and generously shared. This is an example of a "canned" program, designed for another agency being suitable for use. Such use of "canned" programs is not recommended and worked only because both agencies are in Federal courts, making information needs similar and offense codes compatible.

[5]Generally, there are too many intervening variables (i.e., all the other things going on in a person's life) between a probation officer's work and changes in the person's behavior to enable us to do much more than assume there is a connection (Thayer, et al., 1974).

Staff Resistance

Staff resistance to introduction of computerized information systems is universal and should be counted upon in planning. The primary reason for this resistance is that management information systems disturb the informal organization of an office by threatening mutual understandings about prestige, communication networks, and power. (Quinn, 1976a). Also, some structural reorganization is almost inevitable, promising managerial headaches (Sullivan, 1981), and clarification of agency goals and policies by making them measurable is required (Zalkind, et al., 1979). Human service agencies generally are not accustomed to formalizing goals. As Quinn (1976b, p. 167) writes: "Traditionally (human) service agencies have been able to preserve their autonomy by resisting rigorous measurement and evaluation. The resistance was possible because the evaluation technique was largely inadequate."

Further, although the effectiveness of services provided by human service agencies is most difficult to measure,[5] it is clearly possible to measure whether or not the service is provided by the agency and used by agency clients. Information systems reinforce (perhaps determine) agency policy, for, usually, what is measured by the system is underlined in importance and tends to get done, what is not measured may be ignored. Consequently, management information systems structure performance, increase accountability, and, at the same time, reduce to some extent line-staff freedom. Tabulated information about the performance of each officer's caseload is readily available, probably for the first time in that officer's career, and caseworkers often are evaluated by the good or bad performance of their clients, rather than by their casework practices (Kagle and Doner, 1979), so workers can be jeopardized by such tabulations. Clearly, there are many obvious reasons for staff to resent and resist computerized management information systems, and compensating benefits to staff are not immediately apparent.

Forms of Resistance. — The most usual form of resistance to a computerized information system and a problem experienced by this project is unconcen by many workers about accurate coding, leading to unreliable data. Weimer (1980), refers to this problem as the "Achilles heel" of information systems often leading to a "vicious cycle" of poor data quality discouraging use of the data, and lower levels of use leading to fewer errors being discovered and corrected, leading to further deterioration in data quality. Many measures, discussed in the next section under data quality, were taken to improve data reliability but two very important measures are refraining from punitive

use of the data which will only ensure more resistance (Quinn, 1976b), and making the information generated as useful as possible to line officers. As much as is possible real incentives for staff should be built into the program (Sullivan, 1981 p.36).

Other usual forms of resistance were less damaging and consisted of turning coding sheets in late, refusing to use the data provided (a second part of the "vicious cycle"), and unfavorable evaluations of the worth of the project ("useless"), the motivations of participants ("empire building"), and the intrusiveness of computers ("Orwell's *1984* is here").

Coping With Resistance. — First, office administration was committed to the project and was very clear in making that commitment known. Without such strong, obvious support the project would probably have failed (Sullivan, 1981).

Second, a "user's group" (called the Research Advisory Group) consisting of volunteers from administration and line staff was actively involved in all stages of the project. This group approved the project and all changes, was kept informed of problems and progress, conducted reliability studies, and supported the project with colleagues. Members sensitive to probation officer concerns were able to represent them forcefully throughout the project. Without this user's group the project would probably have failed. (Sullivan, 1981; Zalkind, 1979; Harrell, 1981).

Third, established office policy is that information on the case control printout is not to be used punitively against the officer. This is obviously a touchy situation, calling for skill on the part of supervisors who must exhibit concern and interest about cases that need attention without threatening negative sanctions. Over the length of this project it has become clear that no officer's caseload is in perfect shape; there are always reports due (or overdue), arrests to report, missing clients to find, etc. Since one of the major reasons for the system is to prevent, as much as possible, caseload problems from turning into "horror stories" (e.g., arrests not reported, clients missing six months) it is easy to see that heavy-handed use of the printout by supervisors would undermine the entire system, whereas skillful use of the information by supervisors benefits both the officer and the organization.

Fourth, benefits for the probation officers have been implemented as a result of the case control project. Officers are no longer required to tabulate their own monthly statistics or to maintain "tickler files." Workloads for most officers are becoming more evenly distributed in terms of classification weights. All requests from officers for specific types of data analysis and all queries amenable to computer retrieval are answered promptly. Probation officers generally state that the direct benefits that matter most to them are the "tickler-file" notices and the monthly review of all their cases forced upon them by the requirement to code caseload performance each month. Several officers have specifically mentioned that they have been saved embarrassment, or worse, because cases they had forgotten, or problems they were overlooking, were brought to mind by case-control coding.

It is in this area of providing direct benefit to line officers and to supervisors that more effort should have been placed during the early stages of the project. More benefits could have been envisioned originally, such as more thought given to simplifying coding by officers, more emphasis placed upon what computerized data could do for each person to make his/her day-to-day work easier, and more attention paid to educating personnel about the variety of computer analyses available to them personally (people unfamiliar with computers are unaware of the complex requests that can be answered from seemingly simple coding-categories).

Fifth, structural reorganization was done by changing the flow of paper work used in opening and closing cases and by establishing a Management Information and Research Section, combining the previously separate statistics and research sections. This has improved turnaround time between data coding and production of reports, resulted in more accurate statistics, and relieved probation officers of all responsibility for coding changes in their caseloads. The reorganization reduced work for many persons.

Poor Data Quality

Data quality, or reliability, is a most critical issue in management information systems and, as Thayer, et al., (1974) point out it is a serious error, often made, to build fancy models while ignoring the reliability of the data base. Our experience is that it is necessary to work hard to ensure reliability.

The problem of poor data quality is widespread, even in hospital medical records (Demlo, et al., 1978). Weimer (1980) writes that the first 20 installations of "PROMIS" (the prosecutor's management information system) were all plagued by problems of data quality, seriously limiting full utilization of the potential benefits of a computerized system. Getting prosecutors to compile data input and error correction forms accurately was always a problem, alleviated only when prosecutors began to realize tangible benefits from the system. Although cooperation in coding can be ordered, and usually is, Weimer (1980) points out that compliance can still be minimal, initiating the

"vicious cycle" of poor data, limited use of the data, even poorer data, etc.

We have formally checked the reliability of coding on two occasions, most recently in March 1982. This was done by recoding from the case record a random sample of cases for one month several months past and comparing the recoding with the original codes.

We made two major changes because of the problems indicated by the reliability studies.

(1) The Management Information and Research Section was established and given responsibility for coding all information not concerned with monthly supervision behavior. That means that all caseload changes and all statistical information such as type of supervision, special conditions, sex, dates of supervision, are entered into the computer by this section. Reliability of these items is now high, and is maintained by having a papertrail for each case, and periodically reconciling the computer file with card files that regulations require. Each probation officer is given a "discrepancy form" to note errors in his/her monthly coding sheets. Surprisingly, there are over 200 changes in the caseload every month (i.e., persons entering and leaving supervision for numerous reasons). Initially, probation officers did the coding of these items, and it became apparent that was unsatisfactory when the discrepancy between the computer file and the card file went over 200 in several months. Our experience is that with so many caseload changes from so many different sources it is essential that coding of these items be restricted to a section with clear-cut responsibility for it. Also, we have become more formal, requiring written evidence for every change made (no longer can probation officers phone in changes) since without such evidence discrepancies and errors are impossible to trace. We have reduced discrepancies requiring investigation and reconciliation each month from around 60 to around 10.

(2) Our second major change, involving monthly supervision behavior coded by probation officers, was to simplify coding when feasible. For example, we first required a count each month of the number of positive urines for a case. That count was ureliable, but whether or not the client had none, or one or more positive urines is coded reliably. Since there is no pressing reason for an actual count, the categories were changed to "no positive urines" and "one or more." Some items (drug-treatment status) could not be reduced. Although, over all, drug-treatment status is reliable, cross-tabulation of sample coding with actual coding indicated confusion in how to code the category "urine surveillance only." Consequently, reliability of some items can be improved by more careful wording of the coding manual and/or retraining.

Training programs and a manual were produced from the inception of the project. There have been several revisions of the coding manual in response to the results of reliability checks and comments from staff. Training of all the staff was done at first and then retraining done for weak items after the reliability check.

There have been two checks of reliability done. Currently only two items are unreliable: alcoholic treatment and case contacts. The first can probably be overcome by adding a category "alcoholics in remission" which was omitted, and the second item is unreliable, staff thinks, for two major reasons: Staff wants credit for work done and are reluctant to code no face-to-face contact (with client) when they have seen significant others, talked with the client by telephone, etc. Also, when this item is coded from memory, officers confuse "no face-to-face contact" with "out of contact" (i.e., the client is missing, perhaps absconded). In order to simplify noting contacts, each officer is now provided with an alphabetical printout of his current cases and a duplicate, to keep, of the case control coding form. Reliability of this item will be rechecked in a few months.

From the reliability study it is apparent that the drug treatment unit (responsible for supervision of about 300 persons with drug-aftercare special conditions) does very accurate coding. This is congruent with the idea that reliability depends upon officers' perceiving the usefulness of the management information system since the drug treatment unit utilizes the system more than any other unit for specialized information about their clients.

Interorganizational Conflict

This evaluation project depended upon the cooperation of personnel from two agencies that are administratively independent from each other. This is often the situation in the implementation of computer systems, and one that often leads to conflict if the problems involved in integrating the technical skills of the computer program experts with the substantive skills of the user-agency are not fully appreciated. It is common for computer programs to fail because they do not meet the needs of the users, particularly if "canned" programs are purchased (Weimer, 1980; Harrell, 1981), so close cooperation is absolutely necessary. Fortunately, such cooperation existed during the pretest and design stages of this project, so that the system meets the needs of the office reflecting user-agency priorities.

There were, however, interagency problems during implementation of the project that were finally resolved by meetings among the administrators and personnel from the two agencies. In retrospect, the problems grew, in part, from ill-defined issues of "turf" — who was responsible for controlling the project? The literature indicates that implementation of computer systems is most successful when control unambiguously lies with the user-agency, and the advisory, not policymaking, role of the computer specialists is clearly defined (Zalkind, et al., 1979; Weimer, 1980, Harrell, 1981). In this case, the issue was further complicated because the project was defined as a research project and both staffs have research competence. The further issue of who controls the research, including changes in procedures, was also ill-defined. It is strongly recommended that such issues be specifically clarified when interagency coordination in similar projects exists. The project could have failed over these issues; it did not fail because of the commitment of agency heads to their staff and the project. The experience has lead to a better appreciation of the fact that successful and rewarding professional and collegial interoffice relationships occur through trust, mutual respect, clarification of roles, and an absence of malice.

Project Goals

Weimer (1980) points out there are six output areas possible with management information systems: operational information (data on particular cases), logistical support (generation of schedules), management control information (data on consistency between practice and policy), problem analysis (identifying and exploring policies and procedures needing review) strategic planning (dealing with expected changes in the organization's environment), and general research (producing empirically based knowledge, in this case about crime and the criminal justice system). Many systems achieve only the first area (operational information), some achieve full utilization of computer technology by producing outputs in all six areas. This project falls in between. This section lists the original project evaluation questions made in the proposal to the Federal Judicial Center Research Division and subsequent project results under the output areas suggested by Weimer.

Operational Information

Monthly Statistics

One of the project evaluation goals was to determine whether it was feasible, in comparison with the manual system in use, to tabulate monthly statistics tracking caseload changes. This proved the most difficult part of the project, by far, to implement (see the section, "implementation of system") primarily because of the complexity of the changes, the sheer number of them, and the need to change office structure to centralize the flow of input data, eliminate word-of-mouth changes, reconcile the existing statistical cards with the computer file, and set-up error tracking mechanisms. Since the computerized system was in existence one year before introducing the statistical programs, we made the serious mistake of trying to begin producing statistics with both the computer system and the manual system continuing as before, making adjustment as errors developed.

Results. Statistics are now tabulated monthly by computer. It has been worth the effort for reasons of accuracy; it is suspected that very few manual systems with more than several hundred cases approach the accuracy possible by computer. For example, we found a simple arithmetic error of 50 cases that was being carried over month-by-month in the manual system. With a computerized system errors can be located quickly, the caseloads reconciled periodically with a minimum of effort, and tabulations produced easily.

Recommendations. We would strongly recommend that the process we used be reversed. Needed changes in the flow of data collection and in error correction procedures should be worked out first and pretested. (Our experience is these systems do not work, at first, as envisioned.) When the computerized system is ready to go up, there should be a cutoff date where the manual system halts, and the computer file begins by entering data case-by-case from the manual system. The computer file should then be printed out and reconciled case-by-case with the manual file. Starting absolutely "even-steven" will greatly reduce subsequent problems and save time in the long run.

"Tickler-file" Notices

Another evaluation goal was to determine if "tickler-file" notices (e.g., printouts for probation officers of supervision reports due, cases at risk, and cases needing attention) could be produced.

Results. These files have been no problem, and are reliable. They are, generally, the most popular part of the new system with line officers. They were modified, after one year, in response to line officer requests that names stay on the list from months prior to the report's due date (e.g., yearly parole progress reports, reports due prior to expiration of sentence, periodic review of warrant cases, etc.) until the month of the due date, instead of a "one-shot" notification 3 months before due date.

Recommendation. Such notices are very useful to the staff and highly recommended. To ensure maximum utility, the users (i.e., line staff) should be involved in deciding upon what items to include in these notices and the printout format.

Logistical Support

Evaluating the use of a computer for logistical support (e.g., scheduling court appearances, tabulating mileage) was not part of the original proposal nor has it been attempted. Currently, there is consideration being given by a clerical supervisor to using the computer to maintain office leave records since a "canned" program in near-by government office is available.

Management Control Information

Case "Slippage"

An important reason for inaugurating the computer system was to see if providing monthly "feedback" about cases to probation officers and supervisors would reduce case "slippage" (e.g., forgetting violation reports, months passing without contact with a client, etc.).

Results. This has been one of the more successful results of the program. Case "slippage" was reduced markedly almost from the beginning of the project, and "horror stories" are infrequent. It is important to note that there are two ways the case-control system reduces "slippage"; it forces a monthly review of all cases the first of the month, and around the middle of the month, probation officers and supervisors receive a report listing cases that are in need of attention. Probation officers feel the monthly review is the most important part of the process; generally, by the time of the printout they have taken care of most items. However, if they have forgotten, the printout serves as additional reminder.[6] Several officers have proffered anecdotal evidence illustrating how the printouts have "saved my neck" by reminding them of cases they had forgotten. Further, cases no one recognizes turn up from time to time on discrepancy forms from probation officers so that issues of case ownership are resolved. Undoubtedly, some of these cases would have "slipped between the cracks" under the manual system.

Recommendation. Since the success of reducing "slippage" requires accuracy in coding by probation officers it is in this area that supervisory skills in the use of the printouts are required. Office policy should prohibit punitive responses to supervision problems highlighted by the reports or using the reports as evidence of officer inadequacies. This would clearly be dysfunctional, undermining cooperation and reducing data quality (Quinn, 1976).

Case Contacts

Another issue in the original report was whether case contacts by probation officers would conform to classification criteria, which were then minimum-risk supervision cases be seen once every 3 months, medium-risk supervision cases at least once a month, and high-risk cases at least three times a month.

Results. First, and most importantly, it was determined during the first year of the project from analysis of violation rates for medium and high-risk cases that violation rates varied according to current drug usage and/or unemployment. Those cases not currently in crisis (i.e., not using drugs and having a legitimate source of income) violate much less frequently than those in crisis, regardless of classification. Consequently, risk is a dynamic process changing according to circumstances. It makes little sense to require three contacts a month for every high-risk case. These results, along with other factors, were considered by the Probation Division, Administrative Office, U.S. Courts, in arriving at supervision guidelines of at least one contact a month for high-intensity supervision cases (not three), with additional contacts to be made depending upon case needs. Consequently, case-contact criteria were changed during the project.

Second, probation officers felt that the number of face-to-face contacts did not measure supervision quality. The Research Advisory Group spent two meetings developing a qualitative supervision scale with three categories: routine supervision, planned counseling, high-activity counseling.[7] Explicit descriptive criteria were developed for these three categories, and the scale is reliable (somewhat to our surprise). It has been determined that supervision quality follows office policy — almost all of the attention is given to high-intensity supervision cases. Drug cases typically receive high-activity counseling, in line with office policy.

Third, the case-contact item has never been reliable throughout the project (see discussion under the "poor data-quality" section). A count once a month of the raw number of face-to-face contacts is obviously likely to be unreliable. Currently, however, the item has only two categories ("none" or "one or more"), and it is still not reliable. We believe we will be able to obtain reliability shortly.

Recommendations. Reliability of case contact, if coded by the probation officers (alternate ways of coding this item are conceivable), need careful attention. More time than we spent should be devoted to explaining the importance of this item and its relevance to office reputation and outside evaluation. Further, easy methods for probation officers to keep an ongoing tabulation of this item should be developed. A supervision quality category is perceived by officers as more reflective of work done and establishing such a category is recommended.

[6]Another reason "slippage" has been reduced is that the staff is more experienced than it was; no new probation officers were hired during most of the project.

[7]Originally "routine supervision" and "monitoring and surveillance" were separate categories. They have been merged into one category, since it is not possible to reliably differentiate between them, and, qualitatively, the differences are slight.

Turnaround Time

A major concern was whether the time between coding the data by probation officers and production of printouts could be made rapid enough for useful feedback. After all, stale reports are valueless.

Results. Although turnaround time was well over a month during the pretest and first year of the project, it has been reduced to 10 or fewer working days, providing reasonably prompt feedback. Between submission of data and production of printouts, data are entered into the computer, discrepancies pointed out by probation officers cleared up, recognizable coding errors in the data eliminated, and imbalances between the previous month's data and current data resolved. We have never had a totally error-free month, nor do we ever expect one, but the fact that data entry is done in the office and that personnel have become trained in error search, able to find them and correct most of them routinely, has greatly reduced turnaround time.

Originally, many probation officers were late in submitting completed coding sheets. This is a common problem of resistance frequently occurring when computer systems are implemented and sometimes for a long time afterwards (Weimer, 1980, Quinn, 1976b). This problem has disappeared; pressure from supervisors on officers is no longer needed, except occasionally, for prompt return. One reason is that after 3 years the system is accepted as a here-to-stay routine office requirement. Also coding for officers has been greatly simplified, reducing the time needed for conscientious coding from 1 to 2 hours to around 20 minutes.

Recommendations. Reduction of turnaround time depends upon training, experience, and acceptance of the system by staff so all steps that are taken to enhance those factors would be helpful. If line staff do any coding or data entry, simplification of these tasks for them so they are not very onerous is essential.

Monitoring by Supervisors

An issue in the proposal was whether or not supervisors would use the information provided by the system to constructively assist probation officers in their tasks. Since middle-management persons are often more resistant to computerized systems than other groups in an organization because they may feel a loss of autonomy and because information previously in their private domain is now filtered upward (Quinn, 1976b), middle-management personnel could easily become an effective focus of resistance to implementation.

Results. The easiest way for supervisors to have damaged implementation of the system would have been to utilize the printouts as proof of officer incompetence and failings, coupled with insistence that almost no problems appear on the printouts for officers to receive good evaluations. None of the supervisors did this — quite the opposite — they have been very nonthreatening in their use of the printouts, so that officers accept without comment or complaint the information going to supervisors. Most of the supervisors, at one time or another, have made requests for specific information from the system to aid them in their planning. They continue to also monitor work by review of case records and consultation with the officers, not making the mistake of relying upon the computer system for their information about officer performance.

Recommendations. We believe it would be helpful for supervisors to be aware at the beginning that while computer systems can highlight case and system problems and monitor measurable performance, in a human services agency it in no way obviates the need for supervisors to continue to consult with their workers, read case records, and train and educate their workers in agency practice and agency policy.

Further, top management should not use the system as a means of proving supervisor incompetence just as supervisors should not use the management information system in such a manner against probation officers.[8]

Problem Analysis

Data for Planning

One of the original proposal questions was whether data could be generated that was useful for administrative planning and decisionmaking.

Results. Uses of the system in this manner have been numerous and the ability of a computerized system to provide such information is one of its greatest advantages over a manual system. Quite simply, there is a great deal of useful, retrievable material in a computerized system that is out-of-reach to a manual system. One example: The system was used to analyze the differences between clients who succeed and who fail with community service orders enabling rational, empirically based planning around changes in

[8]At this point, some readers may be thinking a policy against using the system to prove incompetence could be wrong-headed, allowing incompetence to be overlooked. Obviously, however, computer systems are not needed to discover and deal with incompetence; organizations have been doing that for years, and although that may require more work than using the information system, why undercut data quality because of laziness?

the program to take place.[9] Data from the system was used in planning the Specialized Drug Treatment Unit for persons with drug aftercare conditions of supervision, for changing pending supervision guidelines into guidelines more reflective of current risk and of case needs; for determining adequate case record sample sizes for management review teams; for recommending changes in the workload formula for probation offices; for checking on the accuracy of urine testing and locating people who may have been revoked because of subsequently discovered inaccurate testing, for determining if the field work varies with the amount of paperwork, and for determining the percentage of probationers with fines.

Proposed programs or changes in programs are frequently not implemented because of data provided. For example, it was discovered that non-violent, non-drug-using, poor-risk cases on probation were too rare to justify planning community service as a possible alternative sentence for these types. Also, unanticipated results do occur (e.g., amount of field work and amount of paperwork are unrelated). In sum, for planning purposes there is clearly no substitute for easily accessible, detailed empirical data such as that provided by computerized management information systems.

Recommendations. To make data for planning feasible the user agency must do all it can to ensure data quality (a recurrent theme in this paper) and must train or have personnel able to manipulate the data through fourth generation, "user-oriented" languages. And, of course, fourth generation languages have to be included in the software design. These languages are relatively easy to learn, requiring rather minimal training followed by telephone consultation over problems for a period of time and a great deal of "hands-on" experience.

Strategic Planning

Strategic planning is the provision of information that will enable administrators to cope with changes in the organization's environment. This project was not designed to provide information on that level, although it does offer the ability to track changes in caseload types, sizes, and outcomes from month-to-month. (Of course, a manual system measures such gross changes also, although probably not as accurately.) Strategic planning is generally the responsibility of central offices and not local offices.

Research

Evaluative Research

An original question in the proposal was whether the system would provide data for evaluative research regarding office programs.

Results. We completed several useful evaluative research projects through the use of the system. The community service program, the community resources program (i.e., job placement, emergency services, job training), and an office participant-management project were evaluated. The probation risk-scale in use has been periodically re-validated. There is no question that a computerized management information system makes evaluative research easily possible.

Recommendations. Like providing data for planning, evaluative research depends upon data quality and agency ability to use user-oriented languages for data manipulation and analysis.

General Research

A management information system can provide data for general research that has implications for the criminal justice system as well as for office programs and planning.

Results. The system provides a data base that can be used for general research. For example, we are currently looking into the interactions between drug abuse, education, employment, and arrests in order to better understand why high school graduates who have never used drugs consistently succeed under supervision and to obtain knowledge that may lead to improved programs for addicts. Also underway is a project investigating the personnel and situational attributes of persons under supervision who commit violent acts, such as violence against family members, fights at work, or violent criminal offenses.

The data base is available, under supervision, for college-student interns working in this office and to officers pursuing advanced degrees. All requests from academic researchers and other legitimate research organizations are considered. It should be emphasized that all general research proposals, whether from staff, students, academicians, or research organizations, must be approved by our Research Advisory Group after submission of a formal request from the researcher. In particular, Federal guidelines regarding the protection of human subjects in social science research are followed.

Recommendations. General research, again, requires quality data and user-agency capability with user-oriented languages. For general research it is imperative that the agency boundaries and data be adequately safeguarded, and that the human rights of both staff and clients be respected. This requires formal, written research guidelines, and a mechanism for prior approval of all research projects.

[9] In this case younger opiate abusers were almost all failing; older, "solid-citizens" were almost all succeeding. One of the problems with this type of information is that many persons feel it is obvious after it has been presented, asking "who needs a computer to find that out?" There are two responses to this criticism. One is, obviously, where was the data to prove this "obvious fact" before? Typically, all of it was impressionistic or anecdotal. The other is to ask recipients of the information to say what the results are before they are presented. Some guesses will be correct; most will not.

Review

The central necessity for a management information system is the maintenance of data quality. Obviously, with poor data, the system is limited and agency personnel will not use and will denigrate it leading to failure.

Figure (1) is a graphic presentation of our experience with establishing and maintaining a practical information system. Use of the system depends on the interaction of several factors.

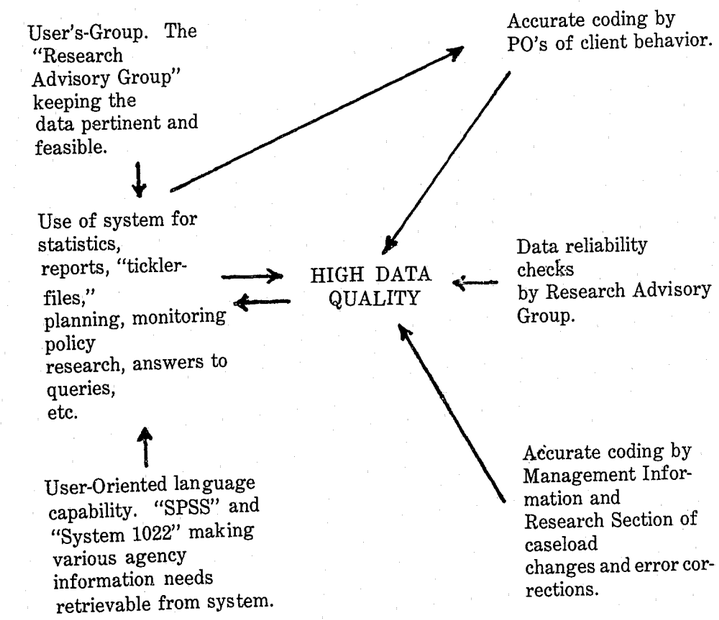

Figure 1

Factors related to establishing a successful information system in the U.S. Probation Office, District of Columbia.

Reviewing figure 1, we see that agency use of the system is based first upon high data quality, and vice versa. Increased system use increases quality essentially by creating vested interests in accurate data as the system becomes personally useful to agency staff. Consequently, system problems and errors are located and corrected, and suggestions for improvement made. However, without a reasonable level of data accuracy, staff will not care about quality since they will not rely on the system and Weimer's (1980) "vicious cycle" of deteriorating use and deteriorating data quality will begin. Consequently, it is essential to obtain good quality data by all feasible means, and to increase agency use of the system as much as possible.

In addition to high quality data, agency use of the system depends upon producing practical information for both administrators and line-staff; information that makes their jobs easier and their performance more effective. Our experience is that producing this practical information requires establishment of a representative "user's group" to approve research requests, proposed changes in report formats, data items, training, plans, system forms, and coding manuals. This group should be sensitive to staff complaints and concerns about the system and represent them accurately, as it is important to have com-

munication about the system flow from line-staff upwards. This group ensures the system will not stray too far from the practical needs of users. Further, agency personnel should be helped to make use of the system by encouraging requests from them for data analyses important to their work, and all agency staff should be able to request information from the system. Providing workers at all levels of the agency with computer outputs that are useful is one of the primary means of overcoming staff resistance to the system.[10]

Finally, agency use of the system depends also on the user-agency having capability in some user-oriented languages so that research, reports for planning, responses to queries, etc., can be made easily, without consultation, and tailor-made to agency requirements.

Data quality also depends, obviously, upon accurate coding of the data. We found it best to shift as much coding responsibility as possible to a Management Information and Research Section clearly accountable for reliable data. The flow of paperwork initiating statistical changes (warrants, transfers, etc.) was redesigned and centralized to ensure a paper trail and passage of all this information through the Management Information and Research Section. Individual probation officers necessarily have to code client adjustment data. This requires training, a coding manual, and error correction forms for the probation officers. We also made periodic reliability checks and will continue to do so. Following such overall reliability checks, problem-solving and re-checks can be concentrated upon any items that are currently unreliable.

Obviously, poor data will kill off the system and we feel the quickest way to have this happen is to give probation officers and supervisors reason to defeat the system by using output from it to prove they have been incompetent or to downgrade their performance reports. As Quinn (1976b) points out, bright professionals can defeat any computerized system, and sometimes do so. At heart, a successful system depends upon it being useful and practical, not threatening, to users.

Finally, since it takes many months for the information system of prestige, communication networks, and power in an agency to be rearranged and to settle down again after introduction of a computerized system, many months of staff resistance in some form or other can be expected. Throughout this period of time, commitment of the top administrators to the successful outcome of system implementation needs to be crystal clear and unambiguous.

[10]It is not, however, recommended that all agency personnel be able to enter or manipulate data; data entry and data modification should be restricted, we believe, to persons trained in the user-oriented languages and mechanics of the system.

BIBLIOGRAPHY

Demlo, Linda K, Paul M. Campbell, Sarah S. Brown 1978. "Reliability of information abstracted from patients' medical records." *Medical Care* 16: 995–1005.

Harrell, Rhett D. 1981. "Five principles for successful computer system implementation." *Government Finance* 10:-19–22.

Kagle, Jill D. 1979. "Evaluating social work practice" *Social Work* 24:292–96.

Quinn, Robert E. 1976a. "Productivity, management information systems, and resistence: towards a better understanding." *Public Productivity Review* 2: 5–19.

———1976b. "The impacts of a computerized information system on the integration and coordination of human services." *Public Administration Review* 36: 166–74.

Sullivan, James O., Jr. 1981 "Probation caseload management programs: prescriptions for implementation." *Federal Probation* 45, no. 2: 31–37.

Thayer, Richard, Andrew Leigh, Colin Vyvyan 1974. *Information Use in Social Services Planning and Control.* Carlisle, U.K.: Social Services Research Group.

Weimer, David L. 1980. "CMIS implementation: a demonstration of a predictive analysis" *Public Administration Review* 40:231–40.

Zalkind, David, Harvey Zelon, Mary Moore and Arnold Kalvuzny 1979. "Planning for management information systems in drug treatment organizations," *The International Journal of the Addictions* 14:183–96.

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