INFORMATION SYSTEMS AND PUBLIC PLANNING*†

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Persuaded that management information systems will help them achieve efficiency of operation and attain organizational goals, public planners, like those in the private sector, are eagerly embarking on ambitious feasibility studies and contracting for elaborate hardware and software systems. Since this effort is being undertaken in the service of the public, it is important to assess the social costs and benefits.

The research focus of the work on which this paper is based is on information systems as entities in themselves and as components of a larger systems design. After analyzing the three discretely defined but operationally joined concepts, *information*, *system*, and the *information system*, we examine the four assumptions underlying the general acceptance of the information system as a management tool: (1) that more information leads to better plans or decisions; (2) that more and faster-moving information necessarily enhances "efficiency" of operation; (3) that greater "efficiency" is identical with better public service; and (4) that information systems are best conceived, designed, and controlled by "information experts," whose talents are movable and ubiquitous.

Information systems in public welfare, criminal justice, and land use are reviewed as cases in point, and the conclusion drawn that while there is no gainsaying the fact that in each area a body of organized information is essential to systematic analysis and planning, there exists considerable confusion between quantity and quality, between the necessary and the busy. So far, there is a lack of clarification not only as to the proper constitution of the information system but also about the qualifications of the "experts" designing them.

Unfortunate as these matters are in raising the costs and lowering the benefits (economic and social, as well), they have ominous implications when viewed in the light of the many-fronted encroachments by computerized information systems on individuals' right to privacy. The data bank and the dossier may be rationalized as means to efficiency, but they cannot be reconciled with democratic process and freedom from cradle-to-grave surveillance.

Introduction

There is an unmistakable tendency on the part of public planners from county to federal levels to assume, since their mandate is to "plan rationally", that their first and primary need, in order to discharge this obligation, is a management information system. Implicit in this persuasion is a set of apriorities: (1) if, as public planners, they had more information, they would make better plans, and perhaps arrive at better decisions; (2) more and faster-moving information would improve the "efficiency" of governmental operations; (3) greater "efficiency" would better serve the needs of the community in particular and society at large; and (4) the design of information systems is a technical matter and best assigned to an "information expert", whose movable talent is almost universally applicable. Thanks to the cult surrounding information systems, critical inquiry into these assumptions amounts to a kind of heresy, but it is important that we examine them and review them as practiced lest the new mythology so dominate the social planning scene that only the voice of the devotees will be heard.

So as to provide the perspective for our scrutiny of these four apriorisms, we first

analyze the principal elements with which they are concerned: (1) information, (2) system, (3) the information system. Clarification is necessary and proper because, while there is no gainsaying the fact that a body of organized information is essential to any systematic analytic process, confusion prevails both as to its proper constitution and to the qualifications of the "experts". There are no distinctions between quantity and quality, between the necessary and the busy.

Information

Information, *data*, and, especially in military parlance, *intelligence*, are terms often used interchangeably and frequently equated with *facts* and *knowledge*. As such, they enjoy acceptance in the public mind. Whether because of a historically-derived reverence for knowledge or cultural heritage, we in the computerized age show an enormous respect for data. We feel comfortable with "hard facts", and the more, the better. The very concept "data bank" is permeated with virtue. Associated with the values of the Protestant Ethic, the notion not only conjures up the bright, lively, and good things associated with banking generally,—saving, interest, etc.—but it replaces the dreary and dusty archive, the dead record office.

The allure of a bankful of data, available on command, is practically irresistible to the public administrator. The data base has come to be regarded as the keystone of the art of planning and the arch of learning as well. The current generation of graduate students in almost every academic discipline are card-carriers of the new genre. They can be seen on every college campus, the huge stack of IBM cards their project, the computer their hope for making sense out of and finding a hypothesis in the morass of material. No matter what their field or their topic, they first sally forth to gather data. In much the same fashion, the professional planner, whether in the employ of the CIA, the NEA, or the BSA,[1] whether dealing with pacification in Vietnam, education in the ghetto, or crime in the streets, whatever else he accomplishes, energetically collects data.

At this point, it might be well to underscore an interesting etymological anomaly. *Datum*, by origin, is something *given*. *Data*, the term now so familiar, is the plural form; but as conceived at present, it is something *gotten*. When recognized as such, *data* are divested of the qualities of accuracy and objectivity. In fact, the very opposite may be closer to the truth. The aggregation, selection, and organization of data are all part of a value-laden, mission-oriented process that renders absurd the notion that any information is "neutral". If this were so, it would probably be so vacuous as to be worthless, anyway. Separated from derivation, the context in which used, and the conclusions derived from manipulation, *data* is an empty concept. In operation, we shall see later, it is often fallacious and dangerous besides. C. West Churchman, discussing the social significance of computer technology, suggests that, in the context of social policy, there may be no such thing as accurate or objective information. "Instead, so-called 'information' is simply one kind of incentive, which can be used by one person or group to influence the behavior of another person or group. It is, in fact, a commodity with its own price, a commodity that serves the purpose of shaping social action" [5].

System

The second element requiring analysis in our disquisition on the *information system* is that of *system*. This term is a coverall, and, not surprisingly, generous in scope, loose

[1] Central Intelligence Agency, National Education Association, Boy Scouts of America.

in dimensions, and imprecise in meaning. The Webster International Dictionary offers a range of definitions from which to choose: Meaning number one is "an aggregation or assemblage of objects united by some form of regular interaction or independence; a group of diverse units so combined by nature or art as to form an integral whole, to function, operate or move in unison, and, often, in obedience to some form of control; an organic or organized whole". The second meaning is brief and to the point: "the universe; the entire known world". Number three, a bit less comprehensive, shifts attention to the nonmaterial: "an organized or methodically arranged set of ideas; a complete exhibition of essential principles or facts, arranged in a rational dependence or connection," hence number four: "a hypothesis; a formulated theory". Number five suggests structure: "a formal scheme or method governing organization, arrangement, etc., of objects or material, or a move of procedure; a definite or set plan of ordering, operating, or proceeding; a method of classification, codification, etc.". Number six develops the same notion further, into "regular method or order; formal arrangement, orderliness". Meanings numbered eight through fifteen are specialized and run from *anatomical* through *legal* to *zoological*. Number seven is exceptional and worthy of sober contemplation: "the combination of a political machine with big financial or industrial interests for the purpose of corruptly influencing a government".[2] Purveyors of the systems approach, for all their claim to precision, have so far failed to reveal which of the above definitions they accept. Judging by their unanimous predilection for the plural form, i.e. the *systems* approach, we can only infer that they mean to embrace *all* of the meanings with the possible exception of number seven!

Persons engaged in the analysis, design, and engineering of systems display a remarkable tendency toward solipsism. The system is what they *say* it is. This they study, this they manipulate. And by so doing, they define and delimit *other* systems, for these can only "interface with" the first system and cannot, therefore, be part of it. Paradoxically, absence of clear articulation about the system allows, at one and the same time, for both arbitrary eclecticism and broad inclusiveness. Already demonstrated as any one man's conception, a system, in the broad view, is "a set of parts coordinated to accomplish a set of goals" [6]. Thus, the term *system* is used freely in matters animal, vegetable, and mineral, in the inner city and in outer space. The semantic impoverishment that allows reliance on the same terminology for, say, nuclear weaponry and elementary education then leads to the assumption that systems design, engineering, and analysis as practiced in the first can be meaningfully and appropriately applied in the second. Since any system fits the description, they are alike and, therefore, amenable to the same treatment. The next step in this fallacious logic is that the person who is expert in one system is expert in them all. In practice, we find that there is just about as much justification for commiting society's malfunctioning systems to the care of a "systems expert" as to call upon a hydraulic engineer to cure an ailing heart merely because that organ is essentially a pumping system!

The Information System

Information means less than it says and *system* is an amorphous term, but a remarkable metamorphosis occurs when the two are joined together. The *information system* emerges as a tidy and finite entity, a commodity for sale by hardware and software merchants, the *sine qua non* of planners, business executives, and public administrators. Representing a fusing of computer technology and management science, the informa-

[2] Webster's *New International Dictionary*, Second Edition Unabridged, 1935.

tion system has gained rapid acceptance and enormous prestige. It begins to become evident, however, that the latter has exceeded its accomplishments in the business world where the technology was spawned. Despite aggressive sales campaigns on the part of hardware and software merchants, the rosy dreams of the 1950's have faded. Clerical costs still soar, computers handle many of the pedestrian routines but at a price. Most of the paper problems plaguing management still persist and they will proliferate. Disenchantment is being voiced in such hitherto enthusiastic columns as those of *Fortune*, where an author describes the "misguided euphoria" about computer installations and underscores the confusion as to just what constitutes and what is the purpose of an information system [2]. A survey reported in *Dun's Review* provides details on specific shortcomings. Systems reviewed are shown to inundate managers with useless information, the plethora of which obscures what might have been important. Managers cannot specify nor can the information systems supply just what is needed. Thus, the $1 billion spent by U. S. industry on management information systems seems able neither to equip managers to make better decisions nor to establish justification in salubrious effects on profits [10]. For all their touted "efficiency" as an adjunct to record-keeping, information systems have not provided a tool to estimate or justify their own cost-effectiveness. There seems as yet to be no accounting of the very items crucial not only to the organization paying for the sophisticated technology but also and especially to the computer industry and purveyors of software in substantiation for claims made for their products. Measuring the cost/effectiveness of computerized information has been the subject of many high-level conferences and the object of much professional concern [1]. But the present situation is best summed in the statement of W. Holst (Norwegian Industries Development Association): "the information problem is not solved by hurriedly spending a million pounds" [20].

Of the eudaemonia[3] of public planners who have discovered the information system and, therefore, think they can now proceed "rationally", we shall speak later. For now, it is important to report the extent to which imprecision about what an information system *is* and what it is supposed to *do* prevails as much in the social arena as in that of business affairs. Unfortunately, the confusion is only compounded when one examines the information systems proposed and designed for public use. There are, on the one hand, information systems that are supposed to help managers manage information. Such, for example, is the California Statewide Information System: "The Statewide Information System has the basic objectives of promoting maximum utilization of acquired information" [13]. There are, on the other hand, information systems that are apparently supposed to help managers manage the enterprise or organization. In the real life situation, what starts out as the management *of* information becomes management *by* information.

An example of this conception of an information center is to be seen in a proposed system for the Nassau County (New York) Department of Welfare. The project was specifically intended to: "(1) establish Welfare Department goals and objectives; (2) define information requirements and managerial techniques; (3) establish information acquisition requirements; (4) establish information distribution requirements; (5) develop information feedback techniques; (6) develop decision-making techniques; and (7) develop computerized information systems." The ultimate objective was stated as: "to aid the Welfare Department in optimizing programs, services, and resources

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[3] This term is Aristotle's conception of human felicity, a life of activity in accordance with reason.

to satisfy community needs" [24]. Implicit here is the notion that a computerized information flow is what is needed to improve the functioning of the welfare system and, presumably, deliver better service. In actual fact, Nassau County's poor people are suffering not because their records do not move but because they cannot. Recipients of public assistance, with annual family incomes under $5,000, have been found to be handicapped by poor health, education, and vocational skills, trapped by inadequate transportation facilities, and in pockets remote from jobs [17].

Information Systems in Public Welfare

In California, public welfare has been the target of a number of systems studies, intended to reduce rising costs of aid to the needy. The underlying assumption is that more efficient management of information or paperflow will affect the trend. Management-minded administrators at every level of government recognize reorganization of the information system as a politically palatable device, whereas overt acknowledgment of the handicapping social and economic conditions contributing to burgeoning welfare loads could have unfavorable repercussions. Preoccupation with records, forms and data-processing is frequently a substitute for rather than an adjunct to intelligent social planning.

Aid to Families with Dependent Children was the program selected as the focus for a $225,000 study in California because, the consulting team averred, "it offers some hope of reduction using the techniques of systems analysis". This orientation ignored both the factors which determine dependency and the statutes regulating eligibility for and amount of aid; information-handling procedures assumed a key role in what was loosely defined as "the welfare problem".

Juxtaposed against a table of particular deficiencies of the current data-handling system, as though the proposed information system would correct the failures and shortcomings of the entire system of welfare and reduce dependency, was the following set of "design goals" for the information system study:

(1) to increase the flow of information in order to promote better service and management control at all levels;

(2) to minimize administrative cost and improve efficiency;

(3) to provide research and statistical data for State planning and program evaluation purposes;

(4) to provide inquiry service for questions which cannot now be anticipated;

(5) to provide fiscal data for State planning and evaluation purposes;

(6) to provide a system sufficiently flexible to accommodate changes in needs, volume, policy, and/or data demands; and

(7) to reduce the cost of operations below that of the present information system [23].

Review of numerous systems studies, covering a wide variety of subjects and executed by "experts" from a diversity of disciplines, reveals a predilection for what may be called "flip-chart analysis". Generalized objectives like the seven listed above appear both in the original proposal and in the final report with attainment no closer in the latter than in the first place. In other words, the approach often turns out to be only superficially and semantically analytical, the expertness lying less with operations knowledge and more with jargon-juggling. "Design goals" such as these are certainly commendable, but the information systems provide a rather doubtful vehicle for their implementation or realization. When one probes the items in the flip charts for substance or content, one finds them vague, generally applicable and lacking in specific usefulness.

While there is no denying that current practices have shortcomings, we find little evidence that the analysts' criticisms stem from "technical analysis". They more often than not reflect a hasty review of operations and opinions gleaned from interviews with welfare personnel and others. There are no new insights here; the traditional bureaucratic complaints are merely being used as a springboard for their campaign to sell a new system. That it will overcome present deficiencies is highly problematical; in fact, it could create more trouble than it eliminates.

Notwithstanding the enticement of electronic technology and speed-of-light transmission of data, there still remains the fundamental question as to the appropriateness and relevance as well as the uses to which the information will be put. Information systems have gained ready acceptance in the innocent cloak of being the first and necessary step in the direction of rational planning. But herein lies one of the most serious dangers of information systems. Just because they may, indeed, become the basis for planning, now and in the future, the way in which they are conceived, for what purpose, and by whom remain crucial matters, unsatisfied, and usually ignored by technically-oriented designers. Insensitivity to or lack of knowledge about the substantive issues are often washed out of sight in the deluge of detail enthusiastically captured.

This is clearly illustrated in a proposed welfare information system, which would yield routine facts about age, sex, address, etc., and then respond to "special inquiries". For example, it could tabulate the number of cases in which the mother (unwed) was of a particular ethnic minority, with four children, under the age of six, known to have a mental history, with a police record. And, like the sorcerer's apprentice, it could keep on pouring out information,—that the area in which the family lives has x number of substandard dwellings, y number of known drug addicts, and is z miles from the nearest police station. What is never made clear is how this cornucopia would "reduce the cost of operation below that of the present information system" (item 7 above).

If, in fact, reduction of cost of operations is the main concern, then attention should be given to many matters besides the mere pushing of paper. It is to be recalled that little substantiation for cost reduction has been found in the experience of the business world. Far from cutting down costs or "reducing dependency", sophisticated information systems in public welfare might actually increase caseloads and costs by uncovering and bringing into the system eligible persons now outside public relief rolls. Speeding up investigative and certifying procedures might not be a clear-cut benefit to the system of welfare as we know it. If the claim of reducing cost of operations pertains to record-keeping only, it has not been confirmed by actual experience. The sole reduction would have to be calculated in terms of unit cost of processing; actually, the free-flowing information would be no bargain. Without lowering administrative costs appreciably, the system would at best shift them, with effects on efficiency, however construed, speculative, conjectural, and nebulous.

Criminal Information Systems

Fraught with great significance not so much because of poor economics but rather because of bad social ethics are the many information systems being developed as a weapon in the current war on crime. A key item in the system of criminal justice proposed for the State of California, for example, was "the development of an information system linking together various agencies of criminal justice and being capable of evaluating program and system effectiveness through collection, storage, and processing of appropriate data". By this point in our exposition we should not have to

pause to analyze and refute the shaky foundations for the implicit promise that the information system will yield measures of program effectiveness, however conceived, and that collection, storage, and processing of appropriate data, however defined, will improve the quality of justice. In this instance, the analysts equated "criminal justice" with law enforcement, and accepted as their data base crime statistics for the preceding five years; their assumptions and conclusions about crime present and future were built on offenders convicted in the past. Actually, the statistics reflected merely concentration of law enforcement.

Reliance on arbitrarily selected figures yielded a biased picture, encouraged preoccupation with crime-prone individuals, and diverted attention from crime-making conditions and circumstances. Not the least, although little recognized, among factors to be considered were the prevailing public attitudes toward law and order, detention and bail procedures, state of the court calendar, philosophy dominating administration of penal institutions, and, especially, the local political climate. Moreover, the system left out of account organized crime in its various manifestations, including police corruption. In other words, it concentrated on the hapless and helpless, those least able to defend themselves.

Convicted offender records provide a poor clue to criminality; reported crime rates do little better. For example, the Crime Analysis Unit, New York City Police Department, reported decreases of 2.7, 4.2, and 6.8 per cent in index crimes for July, August, and September respectively. At the very same time, however, a separate Police Department report revealed that arrests during the first nine months of 1969 showed a rise of 17.8 per cent over the corresponding period in 1968 and that arrests on narcotics charges had increased 39.4 per cent [19]. The apparent contradiction was due to the fact that the Crime Analysis Unit used the seven specific categories chosen by the Federal Bureau of Investigation to represent a general level of crime activity: murder, rape, robbery, aggravated assault, burglary, larceny ($50 and over), and motor vehicle theft.

Crime, it becomes evident, is a matter of definition, institutional, cultural, legal, political, and social. If, however, one were willing to accept the simpleminded premise that crime is that which gets punished, one could more comfortably accept the next "logical" step in the development of criminal information systems. This is the determined effort on the part of almost every police department to set up an automated file to implement the capture of criminals. Police information networks, intended to aid in "law enforcement", are operating in many parts of the country, having received an enormous impetus in money and public support through the Safe Streets legislation. In California, where the recommendations of an earlier Crime Study were used as leverage, the Department of Justice paid Lockheed Missiles & Space Company $350,000 (from a U. S. Department of Justice Office of Law Enforcement Grant) to design a system which would meet the "total information needs" of law enforcement agencies. Its main objective was to "aid in direction and apprehension of criminals" [12]. Upon reviewing the proposed system design, even some of the dedicated law enforcement officials were a bit discomforted to learn that the proposed network called for the same items of intelligence about potential *jurors* as *criminals*. What this amounted to, therefore, was institutionalized Big Brotherhood of serious proportions, especially in view of the linkages with other information systems elsewhere in the country.

The main drawbacks of criminal information systems as currently conceived deserve brief review in anticipation of the next section of this paper which deals with

social consequences of the data bank and its implictions for society. Our review has shown that crime information is based on crime as measured by law enforcement activity and definition. Police "crackdowns" on prostitution or lewd movies demonstrate the first; the level of community tolerance to certain kinds of behavior governs the second. The proposed systems would provide only for the mass gathering of baseline data. With all offenders included, persons involved in brushes with the law through civil rights marches and peace demonstrations would be counted like the burglars and rapists.

Planners concerned with improving public policy *vis a vis* crime must ask a number of questions: what objectives will be served by the criminal justice information system? Will it (1) maintain order? (2) protect society? (3) get individuals to conform? (4) increase respect or the fear of the law? (5) improve administration of the law? Then, having satisfied themselves that the system offers some socially healthy promise for a reduction in crime, planners still must face the more fundamental question about proper allocation of resources: should community money be spent on reduction of crime (assuming after the above dissertation that we had a workable definition) or on eliminating poverty and other known and long-run determinants of many forms of crime and delinquency? Although funds for general social improvement might be more effective in stemming certain kinds of criminal activity, it is an inescapable fact of political life that public attention and support are much more readily gained for the computerized law enforcement networks.

Land Use Information Systems

Among the happiest of all hunting grounds for proponents of information systems are those dealing with land use. Attracted by large federal grants and descending upon anxious planners persuaded that a data bank is a prime necessity for their and the community's good, "information experts" of all stripe busily vend their wares. And it may be noted that they meet little sales resistance. Quite the contrary. Uncertain as to goals and defensive as to bailiwick, naive about computer technology and oversold on Space Age management methods, public officials invite feasibility studies by persons who claim expertness in such matters. To ask an aspiring contractor for a feasibility study is, of course, tantamount to inviting a fox into one's henhouse. Not only does his review disclose feasibility but downright indispensability. The bureaucratic overlaps, the jurisdictional duplication, the antediluvian procedures—all are set forth as though newly discovered. And, in neat juxtaposition, is the land use information system, which, presumably, will "facilitate effective sharing of land use data between departments within a jurisdiction and between jurisdictions" [22].

The planners of one such project, for which a $200,000 contract was awarded TRW in 1966, thought this objective could be accomplished "by first obtaining a consensus among users as to the range and type of information required, then establishing policy and standards for data exchange". The final report [4], looking and sounding more like a sales brochure than the result of professional analytic effort, was an agglomeration of platitudes. For example, "Information about land is collected and used by many different organizations at many different levels, i.e.: major agencies of the federal government within the state; major agencies of the state government; counties; cities; industrial and commercial businesses; special intergovernmental organizations and districts".

The final report, a document of about 23 unnumbered pages, presented at most eleven pages of text. Sample displays and printouts accounted for considerable space.

Three and a half pages were simply photographs, neither particularly illustrative nor enlightening. The equivalent of more than a page was given over to decorative but not especially relevant drawings and a full page was devoted to a gallimaufry of items—a clock face, a field, a freeway, a female fiddling with a dial, a fisherman in a canoe, a family picnicking at the seashore, a stylized cow sculpture, an elongated raccoon, and assorted skyscrapers, all pictured on a globe. The numerals *1973* accompanied this fanciful display.

Along with many vague generalizations, there was a display of what might best be called artificially hardened facts. For example, a page of tables showed "basic characteristics of the land data environment" in percentages:

Unfulfilled Data Needs

Federal	5%
State	20%
County	15%
City	8%
District	1%
Private	25%

Another surprisingly precise display provided a summary of "tangible cost savings," e.g. $803,000 in fiscal 1970. Such nicety would impress only persons totally unfamiliar with bookkeeping practices in the public or private sector. Even the contingencies were made to sound as though exactly computed: "If participation and services rendered exceed the estimates used in this analysis, the operation costs will be correspondingly higher; however, the benefits will increase with stronger participation." Further to demonstrate the exactness of the systems team's operations and to allay any notion that the work of information-gathering is not busily done, the final report devoted a full page to a questionnaire used and half of the facing page to the following "survey facts":

"Each questionnaire contained 412 data elements—with 10 questions about each element.

"A total of 844 questionnaires were sent to agencies in state.

"A total of 554 questionnaires were completed and returned.

"The resulting information amounted to 35,000 records and about 10 million characters."

The rest of the half-page was left blank.

In most land use information systems, compatibility of classification is vital to computerization. But the requirement that the data fit into fixed categories obscures important differences and nuances which may be more crucial for planners than their similarities. Selected because they are known and machine-processable, the items passing for a data base are homogenized into isomorphous condition. As adjuncts to the planning process, information systems leave to be desired and yet to be realized most of the rosy promises of (1) better resource allocation and (2) improved efficiency in land usage. As to the former, an experienced government official has observed that most pertinent decisions take place at the ballot box anyway. Regarding the latter, fundamental choice issues enter into the very conception of the term *efficiency*, and, according to one RAND expert, preoccupation with the analytical or managerial tools distracts attention from fundamental issues and policies which deserve study before we even concern ourselves with "efficiency". The problem, as he sees it, "is not absence of knowledge; it is rather that appropriate actions are constrained by political factors reflecting the anticipated reactions of various interest groups" [21].

Alameda County, California, has PIN, a Police Information Network; the State of California has CJIS, the California Criminal Justice Information System; the United Planning Organization, an antipoverty agency in Washington, D. C., is developing the UPO bank, with about 81,000 individual records from local police, education, and welfare files. The New York State Identification and Intelligence System stores data in a centralized computerized facility on persons who have entered the law enforcement files of the 3,600 police, prosecutive, judicial, prison, probation, and parole agencies of New York State. Kansas City, Missouri has a "municipal regulatory system". New Haven, Connecticut is having designed for it by the International Business Machines Company a system to consolidate all of the city files on individuals into a single data pool [25]." The U. S. Secret Service Liaison Guidelines," issued to all federal and local law enforcement agencies, could, if literally interpreted, yield vast amounts of "negative information" of potentially great harm to individuals. Every military and civilian agency, every official bureau, every religious, social, and fraternal organization throughout the land is busily gathering information about people. So also are commercial organizations of diverse kinds. The Credit Data Corporation, for example, maintains personal credit files of millions of persons, possibly some 70 % of the U. S. population [15].

The publisher of 1400 different city directories advertises that for almost 100 years it has been "in the business of keeping track of people—who and how many they are, where and how they live, where they work and what they do". Gathered in the course of city-wide, door-to-door canvasses conducted each year in about 7,000 American communities, the materials become the source record both for printing the directories and for preparing what is called "the Urban Information System". And this is for sale, eligible for federal funding, and available on tape for local processing or ready for merging or cross-reference with other data stored in the company's files [16].

The information systems under consideration and in operation are capable of providing a full dossier on any individual, with complete details on birth (place, legitimacy, etc.), color, religious and political affiliations, organization memberships, school grades, military record, criminal career, financial status, and medical history. A person may have been arrested on a minor juvenile offence, may have carried a protesting placard in a parade, may have had a nervous breakdown. He might have put his name to a politically-unpopular petition; he might have displayed a bumper sticker on a controversial matter. Any of these occurrences could cause him to be tabbed as a potential member of some designated "risk" group and made subject to unfavorable discrimination, if not outright harassment.

The threat of cradle-to-grave surveillance was called to public attention by the Congressional hearings on the establishment of a National Data Center. An understandable desire to take advantage of computer technology in government record-keeping had prompted the Bureau of the Budget, in 1961, to commission a special study for the centralization and computerization of the numerous personal records now scattered throughout various federal agencies. The Task Force, made up of highly respected specialists in economics, statistics, and similar fields, strongly recommended creation of this national data bank. Stressed were the advantages of the proposed facility: *viz.*, centralization and integration of and ready access to information. Neglected was the inherent threat to individual freedom and privacy. The potential dangers were, however, so grave as to arouse serious public debate.

Senator Long and his committee conducted intensive inquiry into all aspects of the proposed Data Center. Congressman Cornelius E. Gallagher, heading a special sub-

committee on Invasion of Privacy, assembled a vast array of documents and brought together the testimony of many authorities [18]. Although Congress ultimately ruled against creating a Federal Data Center, the gesture was a sort of tilting at windmills. The linking together of hundreds of data banks at the various levels is already taking place; the result will be both statistical and regulatory federal data centers, whatever they are called. The Congressional Hearings were, however, not without effect: (1) They opened to a bemused public many hitherto unknown or neglected facets of the problems generated by information in a computerized age; (2) they disenchanted a beguiled citizenry on the matter of technological locks and legal safeguards; and (3) they created a climate of intelligent concern.

As to the first and third points, which are related, the Senate Subcommittee on Administrative Practice and Procedure acknowledged the virtual existence of a dossier, the chairman's portentous introduction stating: "More than two years of hearings have shown us that perhaps one of the most subtle invasions of privacy is that which is accomplished through the use of the information which the Government maintains on American citizens" [14].

A United Nations report expressed concern about possible erosion of human rights through technological developments. Emphasizing as potential dangers the very features regarded as advantages by proponents of a National Data Center, the Commission issued a solemn commentary, worth pondering whenever any information system, large or small, is under consideration.

> One of the important features of a democratic government is the doctrine of the separation of powers which makes it difficult for any branch of the government to jeopardize the fundamental rights of the individuals. Certainly, at present, the multiplicity of agencies and procedures and the resulting red tape protect the individual against undue invasion of his privacy by making it more difficult for various government officials to know enough to cause real trouble. But if all the available data are integrated and stored in a computer in a way permitting instantaneous access to the record of each person, a sword of Damocles is going to hang all the time over the head of everybody. Even the best of us have done something which can be easily blown up out of proportion, or have offended somebody who would be glad to deposit a little misinformation in our file. In addition, there is always the possibility of misfiling, of mistaken identities, or pure spite and vindictiveness of casual acquaintances with warped personalities. On the other hand, it seems quite impossible to envisage a process which would purify the data in the computer through properly protected legal proceedings. Considering the effort required to check the incomplete data which are now available to various agencies, when they have to decide on the employment of persons in positions which are sensitive from the point of view of national security, one can easily see that there are not enough investigators, funds, and, in case of dispute, judges to deal even with one-hundredth of the problem. It is, therefore, doubly important to consider the advisability of the whole scheme and, in case of its execution, to provide sufficient safeguards with respect to the maximum accuracy of the data, their confidentiality, access to them, and the permissibility of their use in situations involving an invasion of individual privacy. [7]

For testimony about protection of privacy through technological barriers to access and legal redress, the Congressional committee heard computer specialists and professors of law. Laymen soon learned that the primary objective of conventional computer hardware and software is fast and inexpensive retrieval of information. To design and construct a system with built-in guards against misuse would add greatly to the cost and thus defeat the very purpose of the system. Moreover, even though additional expenditure for safeguards might discourage some improper access, no system was judged to be impenetrable by powerful organizations for whom the particular mission at hand seemed worthwhile [3].

As for legal protection, there is none. The law is a notorious laggard with respect to technology and no redress is available until *after* damage is claimed and proven. We cannot look to the legislative system for help with respect to technology and its effects, for the legislative process needs a great deal of lead time, while technological development moves at a rapid pace. When the technology, such as the computer, the data bank, or such, is in use, vested interests influence usage. Besides the economic, there are strong political factors which affect and even impede the framing of protective statutes [26]. And privacy still remains a nonlegal concept. "Much of the history of privacy in the law is still ahead of us," observes the editor of *Law and Contemporary Problems* [9].

Many social scientists, who are as prone as any other professionals to perceive the mote in their brother's eye while ignoring the beam in their own,[4] interpreted the failure of the Task Force advocating the Federal Data Center as an instance of trained incapacity. Insensitivity to social consequences, in the name of operational efficiency, might have been expected from computer technologists, but for distinguished economists and statisticians to have allowed the eclipse of considerations as vital as the right to privacy served as a chastening warning: The temptations of technology may be as irresistible to the "soft" scientist as to his "hard" brother. The apologia which later came from the Task Force in the form of a confession of "gigantic oversight" carried an attempt at explanation for it [8]. The Chairman of the Task Force wrote the *post mortem* of the Federal Data Bank. He acknowledged that public fears were founded and, at the same time, suggested a list of additional abuses. However, he dismissed the idea of governmental intrusion as the "stuff" of right-wing ideology". "Without decisively choosing one over the other of these ideological stances, and with full recognition that a government too feeble for the welfare of its citizens in some matters may be too strong for their comfort or even their liberty in others, it is possible to believe, as I do, that the present balance of forces in our political machinery tends to the side of healthy restraint in such matters as these" [11]. The chairman's sanguine confidence in the "healthy restraint" governing the "present balance of forces on our political machinery" is not widely shared, nor can it derive much credence from recent events in the United States and other countries.

Conclusion

Having reviewed the conceptions, preconceptions, and misconceptions involved in information systems, with real-life experience as background and future implications as foreground, we can now reassess the assumptions listed at the beginning of this paper. The first was that if public planners had more information they would make better plans and, perhaps, arrive at better decisions. We now know that they cannot look to information systems as designed and merchandised at present to help them much. In fact, there is more likelihood that they will be inundated by an overabundance of data that will impede their efforts to understand problems in their true and dynamic dimensions. Data selected because they are machine-processable provide a shaky foundation, indeed, for community planning.

The second assumption was that more and faster-moving information would improve the efficiency of governmental operations. We now know that this, like a Sunday band in the park, sounds better than it is. On the technical side, there still remain great difficulties with storage uniformity, cross-availability of data reference items, and retrieval. If overall efficiency of agency operation encompasses dollar costs, there

[4] Matthew, vii: 3,4,5.

is no evidence that the promised economies will be realized. In fact, it could well be that, saddled with elaborate and expensive systems, government agencies will find themselves serving their information systems instead of deriving service from them. Even if there were clear-cut technical and financial advantages, the social benefits are nebulous.

The third assumption was that greater efficiency would better serve the needs of the community in particular and society at large. We now know that "efficiency" is a loaded term. Efficiency of operation could carry very high social costs if it were an instrument for centralization of control and for circumvention or stifling of democratic processes and procedures. The terms of the Faustian bargain defraud the citizen: He receives his tax bill faster, although, despite all the claims about operating economies and efficiency, it is higher every time. But his privacy is eroded with every technological advance that is adopted, presumably, to save his money.

The final assumption is that the design of information systems is a highly technical matter and best assigned to an "information expert". We now know that information is not an entity separate and apart from a context. The selection, aggregation, and manipulation of data are matters where knowledge, not mere know-how, must be applied. Insensitivity to the special problems involved, preoccupation with the mechanistic formal model, and ignorance of the stuff and substance of the real-life situation can result, if taken seriously, in designs for a neatly-programmed future fraught with social disaster.

With all the technologically-contrived information systems that could ever be crafted, wise and humanitarian planners will have to be aware of and take into account the economic balances of power, the sources of pressure, the political and jurisdictional realities, and the likelihood of rapid change and swift reaction as communities become more alert to their rights and responsibilities. Herein reflected are the human and social values of the society and they defy technical handling. They are incalculable, immeasurable, but all-important considerations in plans for the present and patterns for the future.

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