MANAGER OR TECHNICIAN?
THE NATURE OF THE INFORMATION SYSTEMS MANAGER'S JOB

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ABSTRACT

The role of the information systems manager has evolved in twenty years from that of a technician managing a relatively unimportant service function into that of a vice presidential-level, general manager whose department can substantially impact the entire organization. In this paper we trace, by example, the historical evolution of the job and, through an observational study of six information systems managers, examine the position today. The analysis includes the daily activities of the managers, the nature of the oral contacts that constitute 76% of their day, and other points of particular interest. The information systems manager's role is depicted as one of coordinator, motivator, and planner, with a cadre of experts, both internal and external, to provide technical information.

INTRODUCTION

How has the role of the information systems manager evolved with the changing needs of business organizations for data processing? A fictional account of one individual's rise through the ranks of information systems management will serve to illustrate a "typical" case.

Our manager's name is Ralph. In 1958, armed with a bachelor of arts degree, Ralph landed his first job as a draftsman. Shortly thereafter, he transferred to data processing where he designed card-based systems, wired boards, and occasionally ran the tab card equipment.

By the mid-1960's Ralph was Manager of Data Processing, supervising a small staff of programmers, operators, and keypunch personnel. Even in those days the job was a difficult challenge. People with systems skills had to be trained internally, technology changed constantly, and potential new DP applications far exceeded the available reource. Late night phone calls from harried operators and emergency trips to the office to fix system "crashes" were the rule.

In 1972 Ralph changed jobs. He inherited a new title - Manager of MIS - and a new set of problems. (Not that the problems from the 1960's had gone away!) During this period the manager of MIS was exhorted, at least in the trade press, to strive for effectiveness as well as efficiency, to focus on consistent, dependable user service as much as

technological advancement, and to take a broader, bottom-line view of the data processing organization.

Ralph heeded some of the advice; he recognized that he needed a broader base of knowledge and at 35 enrolled in an evening MBA program. His nights were now dedicated to courses, case studies, and, of course, late night telephone calls.

In 1975 Ralph's career hit a large submerged object. A major system exceeded time and cost estimates and failed to meet the information requirements of its highest level user. That, coupled with a lenghthening queue of maintenance jobs and less than satisfactory response times on some online systems, led to predictable results. Our hero was unceremoniously fired!

Although he considered the dismissal unfair, Ralph was not surprised. As Nolan [15] had warned, MIS managers were used as "fall guys" from time to time:

> .. top management mishandles this key individual in many ways: it fails to recognize the fact that he needs to be at least as much a manager as a technician; it usually regards his job as a dead end from which no promotion is possible; it tends to use him as a scapegoat when things go awry ...

Dismissals among MIS managers were common [15,16,18]. In one survey [18], it was found that over 50% of 180 companies had replaced top systems executives within the previous 18 months.

Ralph, nevertheless, did some soul searching. He had attempted to take a broader perspective in this job but it was difficult to escape the day to day problems of deadlines, cost overruns, and new system releases. Ralph was not alone. A survey [11] of over 300 information systems managers showed that, even in large information systems departments, MIS managers tended to list as their primary objectives those related to measures of system efficiency rather than effectiveness (e.g., meeting deadlines, minimizing costs, minimizing turnarounds).

The next job would be different! Fortunately, with the demand for experienced information systems managers far exceeding the supply, "next time" came quickly. Ralph took a job as MIS manager with a larger firm at a respectable increase in pay. In the new job he carefully developed an organizational structure and management control system that fostered a more organizationally integrated information systems function.

Now, six years later, Ralph has another new job, a new title, and a new list of problems. Our hero, now sporting Vice President of Information Resource Management on the door of his panelled, carpetted, corner office, finds text, image, and voice appended to previous responsibilities for corporate data. A sophisticated distributed processing network, minicomputers, and a very high level programming language have all contributed to giving users potential and even some real control over their own data. Meanwhile, however, competing voices call for organization-wide management of the newly discovered "data resource." Vice President Ralph's phone no longer rings at night, which

makes him rather nervous every morning.

Ralph, though a fictional character, illustrates the evolution of this complex management role. It is a role that requires balancing the inherent conflicts of development versus operations, effectiveness versus efficiency, user service versus technological advancement, and user control versus a central data resource. In the remainder of this paper we describe this critical role as we have found it carried out in six organizations today.

PREVIOUS RESEARCH ON MANAGEMENT OF MIS

Although numerous prescriptions for the MIS manager's role exist [2,3,7,8,9,10,14,16,17,19] little empirical research has been conducted. As noted previously, surveys have been employed to examine MIS manager turnover [18] and perceived job objectives [11]. Couger et. al. [6] also used survey techniques to examine motivation levels for information systems managers (at three management levels). They found that these managers exhibited lower social needs than other management personnel and hypothesized that this may interfere with communications with subordinates and peers in other parts of the organization.

Nolan [16] interviewed 18 MIS executives and found two extreme managerial styles. One, described as the "architect", draws a sharp line between technical data processing responsibilities and nontechnical user responsibilities. This manager maintains a highly defined organizational structure and a sophisticated management control system.

A manager characterized by the second style, the "insider," maintains a fuzzy line between the technical and user components of the job. This manager attempts to infiltrate user areas with systems people and has less sophisticated control systems then the "architect."

Wetherbe and Whitehead [22] provide an interesting, though non-empirical, study of the MIS executive. They emphasize the strong distinction between the two primary sub-organizations within the information systems function - operations and development - and the often conflicting managerial styles required in each. Operations is characterized as a closed/stable/mechanistic environment requiring the use of formal policies and procedures. Development is viewed as a relatively open/adaptive/organic environment, requiring a management philosophy emphasizing flexibility, decentralized decision-making and autonomy.

Perhaps the most rigorous examination of the MIS manager's role was conducted by Taggart and Sibley [21]. One of them served as director of a university computer center for six months and collected critical incidents related to his job. These incidents support a management style described as "balanced" between a "user community" orientation and another orientation labelled "systems professional".

Methodologies for Studying Management

Thousands of studies have looked at issues related to leadership and management, but few focus on what managers actually do. McCall [12] found only forty reports of studies on behaviors exhibited by practicing managers. Many of these relied on diary self-reports, a methodology of dubious validity [13,20]. Taggart and Sibley employed a "participant as observer" strategy [4] to examine a single MIS executive at work. An alternative strategy "complete observation" [4], was utilized in the study reported here. This approach had not previously been employed with MIS managers, and because of its high cost is infrequently used in studies of management.

"Complete observation" avoids some of the problems inherent in diary studies. However, the method is so labor-intensive that it is not practical over long periods of time. It is thus difficult to collect a truly representative sample of days at work. It is also difficult to avoid observer biases or changes in work style caused by the observer's presence. (See [12] for a comparision of the two approaches.) Nonetheless, the methodology of complete observation provides a particularly rich view of the information systems manager's job.

AN OBSERVATIONAL STUDY OF MIS MANAGERS

Six information systems managers were asked to participate in the project. The managers met the following criteria:

1. Responsible for both information systems development and operations.

2. Responsible for a department of thirty or more employees.

3. Information systems component constitutes at least 75% of their job.

4. Employed in current position for at least six months.

The purpose of setting these criteria was to provide some consistency across the sample. The result of these criteria, particularly the first one, was that in the organizations selected this manager was at a relatively high level in the organization, usually two levels below the president. Of course, one overriding selection criterion was whether the manager was willing to be observed.

The six participating organizations are categorized in Table 1. All subject managers were male. Four, like Ralph, had come up through the ranks of data processing. Of these, two had been promoted into their present positions and two, like Ralph, had been hired into their positions from outside the company. Two others had been moved into the systems department from a different area of the company.

TABLE 1

CHARACTERISTICS OF PARTICIPATING ORGANIZATIONS

```
**********************************************************************
* DP Employees (range)        *              30-300                 *
**********************************************************************
* Organizational Level        *    Corporate      5                 *
*                             *    Division       1                 *
**********************************************************************
* Industry Type               *    Manufacturing  3                 *
*                             *    Utility        1                 *
*                             *    Finance        1                 *
*                             *    Service        1                 *
**********************************************************************
* Reporting Level (from CEO)  *    One            1                 *
*                             *    Two            3                 *
*                             *    Three          2                 *
**********************************************************************
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Each manager was accompanied by an observer (one of the authors) for three to four days. The observer stayed with the manager throughout the day, usually in an inconsipicuous corner of the manager's office. When the manager left the office he was accompanied by the observer. In a few situations the observer was not permitted to attend a meeting (e.g., a performance appraisal with the manager's superior). In those cases the nature and substance of the meeting were summarized for the observer at its conclusion.

RESULTS

The observers collected data on a variety of dimensions of the manager's job. Some objective data was collected with reliable measures (e.g., the amount of time spent on the telephone); in other cases the measures were subjective, susceptible to varying degrees of observer bias. We report, first, the objective results and then subjective data that must be interpreted more cautiously.

Classification of Management Activities

Each management activity was classified into one of the following five categories:

1. DESK WORK - Managers working alone in their offices, normally at their desks.

2. TELEPHONE CALLS - All incoming and outgoing telephone calls. Data was collected for both completed and uncompleted calls.

3. SCHEDULED MEETINGS - Meetings that had been prearranged. In many cases the meeting was arranged only minutes before.

4. UNSCHEDULED MEETINGS - Meetings that were not prearranged. These included informal and unplanned contacts in the hall, lunchroom, or manager's or other's office.

5. TOURS - Occasions when the manager left his office to walk about the premises. These tours often included one or more unscheduled meetings. Times for these meetings were subtracted from the total time recorded for the tour.

A small number of activities could not be classified using this scheme. Primarily, these were instances when the manager spoke briefly to the observer, made a personal call, or disappeared too quickly for the observer to follow. These were classified as "off the record" and were not analyzed further.

Table 2 presents the occurrences of each activity type for an average day, the mean duration of each type of activity, and the proportion of total time spent on that type of activity. Numbers in parentheses here, and in the remainder of the paper, are ranges for the six managers.

TABLE 2
ACTIVITIES PER DAY FOR INFORMATION SYSTEMS MANAGERS

ACTIVITY	NUMBER PER DAY	AVERAGE DURATION (IN MINUTES)	PROPORTION OF TIME
Desk work	9 (6-17)	9 (5-13)	19% (9-36)
Phone calls	9 (6-14)	4 (2-7)	9% (6-14)
Incomplete calls	5 (2-10)	1*	1%
Scheduled Meetings	5 (2-10)	40 (22-103)	48% (30-67)
Unsched. Meeting**	16 (8-28)	5 (4-10)	20% (11-29)
Tours	2 (0-3)	6 (0-11)	2% (0-6)

* estimated
** secretarial contacts not included

The total number of activities per day (excluding incomplete telephone calls and secretarial contacts) averaged 41 (28-63) for the six information systems managers. Previous research has shown that lower level managers are involved in more activites per day (each of shorter duration) than managers in positions of greater authority. First level supervisors have been shown to participate in about 200 activities per day [12]. On the other hand, Mintzberg [13] found that chief executive officers daily engage in nineteen to thiry-two activities. The number of activities performed by the information systems managers seems to be consistent with their management level.

Activities are generally short. Seventy percent (54-76) lasted less than 9 minutes with only two percent (0-6) lasting more then one hour. Telephone calls and unscheduled meetings were common but constituted a relatively small percentage of the day. Though few in number, scheduled meetings accounted for over half the working day.

Nature of Oral Contacts

Information systems managers spend on average 76 percent (64-91) of their day in oral contacts. Table 3 categorizes these contacts in terms of medium employed, location of the contact, and who initiated the contact. Table 4 breaks down scheduled or unscheduled meetings by the number of people participating. Contacts were most commonly held in the manager's office, attended by one other person, and initiated by the manager much of the time.

TABLE 3
THE NATURE OF INFORMATION SYSTEMS MANAGERS'
ORAL CONTACTS

	PERCENT OF CONTACTS	PERCENT OF TIME
MEDIA		
Telephone Calls	31% (27-36)	13% (7-21)
Scheduled Meeting	17% (7-26)	57% (44-73)
Unscheduled Meeting	53% (48-59)	30% (14-35)
LOCATION		
Manager's Office	69% (50-80)	58% (25-94)
Other's Office	13% (4-23)	7% (4-12)
Hall	9% (2-15)	2% (1-6)
Conference Room	8% (0-31)	26% (0-51)
Other	2% (1-9)	6% (1-16)
INITIATED BY:		
Manager	54% (35-65)	
Other Party	38% (27-58)	
Clock	4% (2-7)	
Chance	4% (1-6)	

TABLE 4
NUMBER OF PARTICIPANTS IN ORAL CONTACTS

SIZE OF MEETING	SCHEDULED MEETINGS	UNSCHEDULED MEETINGS
Two People	53% (0-70)	90% (78-96)
Three People	15% (0-62)	8% (3-20)
Four People	5% (0-28)	1% (0-2)
More than Four People	27% (0-75)	1% (0-4)

Table 5 presents a breakdown of the types of people with whom the information systems manager had oral contacts. Contacts with users constitute a fairly small percentage of the total contact time. Contacts with users were short, with two of every three initiated by the user. Frequently these were operations-related requests for follow-up (e.g., a master file had been improperly updated twice and needed to be corrected). Interestingly the managers spent, on the average, slightly more time with vendors then with users.

TABLE 5

TYPES OF PEOPLE WITH WHOM THE INFORMATION SYSTEMS
MANAGER HAD CONTACTS

PERSON	PERCENT OF CONTACTS	PERCENT OF TIME
Superiors	4% (0-7)	7% (0-10)
Immediate Subordinates	36% (22-45)	38% (23-60)
Lower-Level Subordinates	24% (16-40)	23% (17-32)
Users	10% (3-20)	8% (1-33)
Corporate Service Groups (e.g., personnel, maint.)	11% (6-22)	8% (5-18)
Vendors	6% (0-30)	9% (3-27)
Others	9% (3-9)	7% (1-16)

Purpose of Oral Contacts

In his study of chief executive officers, Mintzberg [13] developed a classification scheme to categorize "the nature of managerial work". Although Mintzberg's categories have been shown to have questionable interrater reliability [5] they do provide additional insights into the information systems manager's job. Table 6 shows Mintzberg's categories of activities and the percent of contacts accounted for by each category. The researchers coded these categories as the primary purpose of each oral contact.

TABLE 6
PRIMARY PURPOSE OF EACH ORAL CONTACT

CATEGORY	DEFINITION	PERCENT OF CONTACTS	PERCENT OF TIME
SCHEDULING	Brief contacts for purposes of scheduling future contacts	12% (8-20)	2% (1-4)
RECEIVING INFORMATION	Manager receiving information from others. Includes briefings and instant communications.	24% (13-47)	18% (6-36)
GIVING INFORMATION	Contacts in which manager passes information to others.	12% (7-21)	8% (4-13)
ACTION REQUESTS	Requests for managerial action by others. Includes requests by subordinates for authorization, requests for the manager to provide information, and requests by users and superiors to initiate something.	8% (0-19)	2% (0-7)
MANAGER REQUEST	Managers requesting others - for information, to follow up on a previous delegation, or to delegate a new task.	15% (6-20)	5% (4-7)
STRATEGY	Contacts preparatory to major decisions. These included long range planning and budgeting meetings.	4% (0-11)	21% (0-70)
REVIEW	Usually rather long meetings dealing with a number of issues. In some cases these were general "catch up" meetings with immediate subordinates. In other cases they were project review meetings.	14% (5-31)	28% (9-36)

Classification of Message Units within Oral Contacts

The categories shown in Table 6 represent only one classification of the primary purpose of each oral contact. Since a meeting or telephone call may result in several outcomes the single classification does not present a very complete picture of the contact.

To provide additional insight into each contact the researchers collected data at a finer level of detail. It was generally possible to record, in abbreviated form, "message units" representing distinct separate communications within a particular oral contact. For instance, the operations manager drops in to report that the hardware problems from the night before have been fixed (message unit 1) and describes the nature of the problem and its solution (message unit 2). The information systems manager inquires how far behind they are (message unit 3). The operations manager responds (message unit 4) and informs of his plans to catch up (message unit 5).

Coding message units involved assignment of a verb to indicate action (e.g., request, inform, acknowledge, make, delegate) and a noun to signify the object of the action (e.g., fact, status, plan, decision, action, opinion, suggestion). The source of the contact was recorded as were two codes indicating the content of the message unit. The first code indicated whether the content of the message was technical or nontechnical. Technical message units were those felt to be difficult for a person with no technical expertise (i.e., related to information systems) to understand. In the above example, message unit 2 was

classified as technical, the others as nontechnical.

The second code categorized the subject matter of the message unit, and was selected from the following categories:

1. Operations

2. New hardware

3. Maintenance/modification

4. New applications

5. New systems software

6. New management control software

7. General administrative (e.g., budgeting, staffing, scheduling).

Coded message units for the contact described previously are shown in Table 7.

TABLE 7
SAMPLE MESSAGE UNIT CODING

MESSAGE UNIT #	VERB	NOUN	SOURCE	TECHNICAL	SUBJECT
1	Inform	Status	Op Mgr	No	Operations
2	Inform	Background	Op Mgr	Yes	Operations
3	Request	Status	Manager	No	Operations
4	Inform	Status	Op Mgr	No	Operations
5	Inform	Plans	Op Mgr	No	Operations

Coding message units presented some problems. When many people were talking it was difficult to record all relevant information. Furthermore, coding was susceptible to observer bias. Nevertheless, the message units provide an illuminating view of the information systems manager's job.

Analysis of the 7459 message units (an average of 392 per day) revealed that only 120 (3%) of the information systems managers' message units and 196 (5%) of the other participants' message units were technical. Figure 1 shows the breakdown by subject discussed. Forty-three percent were related to general administrative subjects; this compares to Taggart and Sibley's findings [21] that 70% of the critical incidents recorded by a single information systems manager were of an administrative nature.

The verb/noun categories present the information systems manager's role from a different perspective. These categories represent the managerial nature of the communication independent of its content. In Table 8 are displayed fourteen verb/noun categories (out of 68 combinations used) that in total accounted for 88% of the total message units. These are divided into three categories. In the first column are verb/noun combinations most frequently attributed to the information systems manager. The second column contains those used approximately equally for the information systems managers and the people to whom they spoke. The third are categories most frequently attributed to the other party in the oral contacts.

TABLE 8
VERB/NOUN CATEGORIES COMMONLY EMPLOYED IN ORAL CONTACTS

USED MORE FREQUENTLY BY IS MANAGER	USED ABOUT THE SAME BY BOTH (*)	USED MORE FREQUENTLY BY OTHER PARTIES
Delegate Action (3/93/7)**	Inform Concerns (4/51/49)	Inf. Fact (9/38/62
Inform Plans (2/64/36)	Inform Opinion (21/43/57)	Inf. Prob.(4/39/61)
Inf. Intentions*** (6/60/40)	Give Sugg/Advice (6/47/53)	Inf.Status (4/34/66)
Request Facts (5/67/33)	Req. Clarification**(5/52/48)	
Request Opinion (3/74/26)	Inform Background (8/43/57)	
Request Status (3/66/34)		

* Classified as "about the same" if 41-59% of the message units were attributed to the IS manager and the other party.

** (% of total message units/ % attributed to IS manager/ % attributed to the other party)

*** Results for these verb/noun combinations are inconsistent between the two sets of managers rated by the two observers.

The results for the verb/noun categories suggest that information systems managers collect hard facts, status information, and information about problems from others; they pass on formal, future plans and less formal intentions. These results hold up well when managers rated by one observer are compared to those rated by the other, which suggests that the rating scales are not greatly impacted by rater bias and that these communication patterns are relatively robust.

OTHER NOTABLE OBSERVATIONS ABOUT THE MANAGER'S JOB

Categorization by activities, purpose of contact, or message units tells only part of the story. Through observation we learned other revealing aspects of the job and the environment of the information systems manager. Several of these are described below.

Computer Based Information Support

Mintzberg [13] found that chief executive officers placed little reliance on formal information sources. The results reported here, ten years later, suggest a quite similar phenomenon for information systems managers. These managers rarely referred to computer-based information systems. When they did, it was usually to reference reports generated from systems developed for other functional areas of the organization (e.g., accounting, personnel). There were few computer-generated reports related to information systems activities and even fewer signs of the so-called "decision support systems" currently in vogue. Like the shoemaker's children, information systems managers seem to be among the last to directly benefit from the technology they purvey.

Keeping Current on Technological Trends

Although the managers all subscribed to trade publications, they generally spent little time reading them. These, and general business newspapers and magazines, were usually skimmed. Sometimes advertisements and articles were torn out and forwarded to others. Generally, managers relied on subordinates for specific technical expertise. Vendors also played an informational support role as described below.

Vendor Relationships

In several of the organizations studied, vendors played important roles. Generally, they provided information to the information systems manager and his staff. Although the vendor was selling a particular product, sales presentations were frequently treated by the manager as opportunities to learn about current technologies and to diffuse that knowledge throughout their organizations. In several instances presentations were given where it was clear beforehand that a sale was impossible. Presentations were often poorly managed, both by the user and the vendor. Typically, presentations were unskillfully executed by vendor personnel, who often targeted at the wrong audience. On the user side, there was little attempt made to match a presentation with an appropriate audience. In some cases a dozen or more people would spend an hour or more at a presentation of relevance to only two or three attendees.

Minicomputer Proliferation

In all six organizations users had begun to acquire their own minicomputers. In at least one organization this was being done without formal approval of the MIS group. This was viewed with alarm by the information systems manager who was concerned with the long-term maintainability of systems developed for this equipment. On the other hand, in three of the organizations this proliferation had been anticipated. Acquisition of minicomputers and stand-alone systems was

even encouraged under guidelines provided by the information systems group. Thus some centralized control over this proliferation was retained in at least some of the organizations.

Managing During an Economic Downturn

One of the organizations studied was undergoing business contractions during the study period. Budget cuts were the rule and every department was expected to share equitably in the cuts. This presented a difficult situation for the information systems manager. Few cuts were possible in the heavily equipment dominated operations budget. The development budget was difficult to reduce as the remainder of the organization turned now to data processing as a way to cut costs and even to assist in the development of a new microprocessor based product.

Office Automation

There was a definite trend toward the merging of information systems and word processing. Two organizations were in the process of forming planning groups for office automation and in three others the information systems manager had responsibility for word processing.

However, there were few signs of office automation technology in the managers' own departments. Only two managers had terminals in their offices; these were used infrequently and primarily for purposes of demonstration. Electronic mail systems were not utilized; one manager,

however, used a voice store-and-forward message system to communicate with his subordinates. Clearly, all the managers relied heavily on face-to-face contacts as shown in Table 3 (i.e., only thirteen percent of total time was spent on telephone calls). In addition, the vast majority of message units, as shown in Table 8, communicated "soft" information rather than facts. The efficacy of electronic mail for these managers is certainly not obvious from the data.

Acquiring and Retaining Employees

As shown in Table 5, the vast majority of contacts (60%) and total time (61%) were spent with first- and second-level subordinates. What is less obvious from the data is how much time managers spent in acquiring and retaining qualified personnel. Some of this time was spent studying resumes or considering alternatives for filling available positions. We generally classified this time as "desk work". The managers also interviewed potential employees (classified as "other" in Table 5). Many of their contacts with "service" groups were with personnel and were related to hiring.

In terms of current employees, the managers were concerned with motivation, training, and career potential of their employees and spent more time maintaining healthy subordinate relationships than they did, for instance, with users. The researchers have no comparable data for other levels or types of managers. However, given the current market for qualified data processing specialists, it is not at all surprising

that hiring and retaining personnel was a major preoccupation of the managers in our sample.

DISCUSSION

The classic parable tells of the blind men who each picturesquely describes an elephant on the basis of their separate physical contacts with varying parts of the beast's anatomy. Similarly our analysis presents the information systems manager from several disparate perspectives.

Nature of the Work

Activity analysis shows a similarity to other managers. Work is fragmented, of short duration, frequently interrupted, and consists primarily of oral contacts - many of them unplanned. Scheduled meetings are few in number but are usually quite long, while unscheduled meetings and telephone calls are common but constitute a smaller portion of the day. Managers spend much of their time in their own offices, frequently in one-on-one discussions with immediate subordinates. Not surprisingly, contacts with superiors are infrequent. More surprisingly, however, is the finding that managers initiated few contacts with users.

The classification of purpose of contact as defined by Mintzberg shows the information systems manager to be heavily involved in activities related to strategic planning and management control and to

spend little time on activities of an operational control nature [1]. They spend the greatest amount of their time in either reviews or strategy sessions. The greatest percentage of their contacts are for the purpose of receiving information. Not surprisingly, they spend less time in negotiation or ceremony than the chief executive officers in Mintzberg's study [13].

The message units illuminate other aspects of the job. The manager is exposed to little technical jargon and responds with less. The majority of discussions are of a general administrative nature (e.g., budgeting, training, recruiting, hiring, evaluating). Those that are information systems related primarily deal with systems development issues. Operations and maintenance/modification represent only 12% of the message units transmitted.

The information systems manager is shown, by analysis of verb/noun categories, to be actively seeking others' opinions, information about existing projects (status checking), and facts required to perform his job. At the same time he passes along organizational plans and his own future intentions. A relatively small number of message units concern actual delegation of work.

Information systems managers use few formal written information sources. Subordinates and vendors keep the manager technologically current, with heavy reliance on subordinates for technical expertise.

Cautions in Interpreting Results

How accurate is the picture we portray? Naturally, it is based on a small, self-selected sample of managers that may not be representative of the broader population. Similarly, it is reasonable to assume that these managers behaved at least somewhat differently while being observed. Finally, observer bias potentially could have affected the coding.

We attempted to provide some methodological rigor through the structured observation approach. We also measured certain behavioral effects that occured because of the researcher's presence. At the conclusion of the observation period both the manager and his secretary were asked to complete a short questionnaire which ascertained how "typical" the manager's activities were during the study period. The only consistent finding was that managers went on slightly fewer tours and tended to spend somewhat less time in informal social encounters.

As noted previously, we compared the verb/noun categories assigned by the two raters for the managers they observed. These were generally similar, providing some evidence for the consistency of the overall ratings.

Nevertheless, this type of study is, almost by definition, non-rigorous. It provides us with a rather fuzzy, big picture of the information systems manager's job. It says nothing about what separates a good manager from a bad one or an effective organizational structure

from an ineffective one. These are issues which future research needs to address.

CONCLUSION

In the introduction we saw the information systems manager's job evolve from a fairly low level, relatively unimportant service function to an important instrument of organizational change and profit making. Through this observational study of six current heads of the information systems function we gain some new understandings of this complex job as it exists today.

Today's information systems manager is clearly more of a manager in the classical sense than a technician. He or she relies heavily on interpersonal skills and the ability to motivate and guide subordinates. The manager is surrounded by technical specialists who provide expertise as required. The manager is not preoccupied with the day-to-day operations of the data processing organization, but spends a great deal of time planning the overall strategy for the information systems function. A great deal of the manager's planning concerns human resources.

A very small portion of the information systems manager's contacts are with users at <u>any</u> level. There was some informal evidence that the managers' subordinates had responsibility for contact with operational users, particularly during development of new information systems. However, one can only conclude that the contact of information systems

managers with functional management at their own level is noticeably absent. Such a conclusion is surprising in view of the plethora of literature advocating "top management involvement" (on the user side) in development of new information systems.

In Couger's recent study [6], it will be recalled that information systems managers were found to have low social needs; Couger hypothesized that this may interfere with communications. Our study both contradicts and supports Couger's findings in different senses. On the one hand, the managers in this study spent 79 percent of their time in verbal contacts, a number which is very similar to Mintzberg's [13] findings for chief executive officers. Whether they enjoyed verbal contacts or not, there is no evidence that these information systems managers avoided verbal communications. On the other hand, their infrequent contact with users may be in part explained by Couger's findings; one may further speculate that they feel more comfortable "with their own kind" and thus prefer to communicate with technical specialists and vendors. The data do not strongly support this conclusion, however. While it is true that the vast amount of the managers' contacts were with technical people, there is little evidence of "shop talk".

While this study provides some insights into the nature of the information systems manager's job, the conclusions that can be drawn are few. There is no indication from this study of whether the managers studied were "effective" in their jobs. Readers, especially information

systems managers, are encouraged to compare the activities reported here to their own "typical day" and to draw their own conclusions about their managerial role in today's organization.

Finally, our research suggests a variety of "problems" that future research efforts can constructively address. These include the following:

1. Distinguishing the characteristics of information systems managers that separate good and poor performers.

2. Developing organizational structures that will better integrate the roles of the information systems manager and the user managers he/she serves.

3. Considering the implications of minicomputer proliferation and developing strategies for effectively utilizing this powerful resource.

4. Developing strategies for dealing with the information systems budget during periods of economic decline or for shrinking industries.

5. Developing appropriate decision support systems to assist the manager of the information systems resource.

We see the information systems manager's role as that of "manager" first and foremost. Good technical support from subordinates replaces much of the manager's need for "hands-on" technical skills. Despite the advocacy of "user involvement", however, much remains to be learned about the relationship between the information systems manager and user management.

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FIGURE I

SUBJECT OF MESSAGE UNITS

NEW MANAGEMENT CONTROL SOFTWARE (1%)

MAINTENANCE/MODIFICATION (1%)

SYSTEMS SOFTWARE (6%)

NEW HARDWARE (7%)

GENERAL MANAGEMENT (43%)

OPERATIONS (11%)

NEW APPLICATIONS (30%)