THE CHANGING ROLE

OF THE

INFORMATION SYSTEMS EXECUTIVE:

A CRITICAL SUCCESS FACTORS PERSPECTIVE

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April 1982

CISR WP#85

Sloan WP # 1297-82

Center for Information Systems Research

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ACKNOWLEDGMENTS

There is little doubt today that the job of the information systems (I/S) executive is changing. The role of the computer in major organizations has shifted significantly and so have the tasks of its chief manager. At a general level, there is a fundamental feeling throughout the profession that the "technically oriented" information systems executive of the '60's and '70's is rapidly being replaced by a "managerially-oriented" executive of the 80's. However, precisely what this means is, as yet, unclear. This paper reports on the results of one research study aimed at increasing our understanding of the evolution of the I/S executive role.[1]

Even to a casual observer of the information systems field, it is clear that the way an I/S executive must conceptualize his job is in the process of evolution. The information systems field, itself, is undergoing a significant change. Through the decades of the seventies there was a rapid evolution from "centralized data processing" to "distributed data processing". Under the centralized mode, all machines and systems personnel were located in one, or very few, geographic locations under a single, line I/S authority. Managerial reporting relationships were straightforward and uncomplicated. Now, under "distributed data processing", the geographic sites of machines and personnel are widespread. Today, geographically-dispersed data processing managers report both to local line super-

visors and to the information systems executive who must
thus cope with the time-consuming added burdens of matrix
management.

In addition, most recently, a profusion of new tech-
nology supporting a diverse array of new computer-based
activities has burst upon the scene. This new, more ef-
fective and increasingly efficient technology, combined
with changing external conditions (e.g. inflation, increased
understanding of computer technology on the part of younger
managers, increased competitive pressures, etc.) has
initiated an age in which end user oriented systems (on-
line data inquiry and analysis, office automation, electronic
mail, and teleconferencing), are rapidly becoming a wide-
spread reality in major organizations. The growth rate in
each of these "end user" tools at all levels in the corpo-
ration is very high, ranging from 30-100% per year in a
set of companies recently studied.[2] As we move through
the '80's, it is predicted that terminals ultimately will
be present on all desks - those of clerks, managers, and
senior level executives.

In short, in a period of a very few years, the domain
of the I/S executive has grown dramatically. Only a decade
ago, the typical I/S manager was concerned solely with a

limited accounting-centered application set, a very few centrally-located people, and one or two large computers over which he had close and almost absolute control. To the contrary, today's computer environment involves a very diverse set of applications supporting fundamental operational activities in almost all parts of the organization. Computer hardware is widespread and is supported by geographically diverse information systems personnel whose clientele is rather quickly expanding to include almost every person in the organization.

I. The Study

It is clear this transition is well under way in almost every major organization. We sought in a recent research study to focus specifically on the evolution of the I/S managerial role to meet this change. To do this, we conducted extensive interviews in nine major companies having a reputation for outstanding I/S management. The companies were selected at random from a list of 20 companies suggested as being outstanding in this regard either by academic colleagues or by industry contacts.

A primary emphasis in the study was placed on understanding the "critical success factors" of the I/S exec-

utives. Critical success factors are the few key areas of
activity in which favorable results are absolutely neces-
sary for a particular manager to reach his or her goals.[3]
It was felt that by zeroing in on those areas of activity
perceived by these executives to be most significant for
the well-being of their organizations we would target the
fundamental issues and tasks to be dealt with by I/S exec-
utives in the '80's. From this "critical success factors"
base it was felt, a role model for the I/S executive would
emerge.

Method

Any definition of the objectives, critical success
factors, and operating methods of a "model" information
systems manager must be, by definition, subjective. Our
research was, therefore, case-based and inductive. Inter-
views were conducted with the head of information systems,
three to five of his subordinates, his superior, and two
or three key users in each company. We asked all these
individuals to discuss the objectives, immediate goals,
critical success factors, organization structure, planning
processes, and control systems of the information systems
organization. Evaluative comments as well as descriptive
comments were sought from each individual. On the average,

one and one-half to two days were spent at each company talking to the various participants. The average interview with the head of I/S consumed one-half day. Other interviews were each approximately two hours in length.

As part of the interview, each head of I/S was asked to identify and explain his critical success factors. Other interviewees were also asked to comment on what they believed the CSFs were for the I/S executive. Perhaps not surprisingly, since we sought excellently managed I/S departments, there was substantial agreement in each company with the I/S critical success factors described by the I/S head. Disagreement primarily was at the margin, and only very rarely of a fundamental nature. Because of this agreement, we will focus in this article on the critical success factors.

As Exhibit I shows, the companies selected were, on the whole, large and significant companies, but not industry giants. We selected companies where the head of information systems still had primary line responsibility for the function. Omitted from the sample, therefore, were companies of the stature of Exxon and General Motors where the chief information systems executive for years has had essentially only a staff, coordinating role for almost independent divisional information systems groups. Although this class of

information systems executive also deserves study, we
targeted the vastly more numerous I/S executive who has, in
the early 1980's, both line and staff responsibility. As
Exhibit 1 shows, our sample is dispersed over several dif-
ferent industries. It includes two of the top twenty banks,
a major insurance company, one of the five largest airlines,
one of the five largest railroads, and four manufacturing
firms, three of which are in the Fortune top 200.

Results

Although many interesting facts and ideas emerged from
our interviews, three major findings are perhaps most rele-
vant:

1. Although the critical success factors, as stated
by each manager, are different from company to company,
they converge to a set of four distinct critical success
factors which might be termed an "I/S executive CSF set".

2. Each I/S executive has established a distinctive
and broad set of managerial tools, techniques, and processes
aimed at facilitating good performance in each "critical"
area.

3. Although individual managers obviously differed
in several ways, there appear to be striking similarities in

the managerial viewpoint of these nine managers. They
exhibit many managerial behaviors in common - as evidenced
both in the interviews and as described by others. This
emergent "profile", with its concomitant CSFs, is worth
considering as a role model for the I/S executive of the
early '80's.

These three major findings are discussed in subsequent
sections of this paper. First, however, to provide the
reader with a better feel for the results, we will detail
the particular circumstances and resulting CSFs for four
of our sample.

II. CSFs of Sample I/S Executives

The critical success factors for each of the nine I/S
executives are summarized in Exhibit 2. Each of the CSFs
in these exhibits is a shorthand statement of those limited
number of areas where "things must go right" for the I/S
function to be successful and for the I/S executive's goals
to be attained. In order to understand these briefly-stated
CSFs better, we will first discuss the CSFs for the I/S
executives in companies A-D. Each is in a different company
with quite different specific circumstances, leading to some
differences in their CSFs. Yet many similarities can be noted.

Company A: Railroad

The head of information systems in this large rail-
road is a multiple-decade veteran of the organization,
reporting directly to (and enjoying a close personal rela-
tionship with) the President. Since the company is in a
rather mature, not highly profitable, business, resources
for the I/S function are limited and must be efficiently
used. Accordingly, three of the five critical success fac-
tors (Exhibit 2) for this I/S manager reflect this concern.

The first CSF reflects his strongly felt need to have
the tools, techniques, and processes in place to manage
most effectively the limited cadre of information systems
people available to him. Equally important, however, is to
ensure (as reflected in CSFs #2 and #5) that his people are
"working on the right projects". With limited resources,
priorities must be selected with care. To ensure that
priorities are correct, it is important for him to have
close ties with the operating officers of the railroad. His
direct link with the chief executive officer is most impor-
tant in this regard. Toward the end of the interview, the
I/S executive said he forsees some near-term movement toward
increased end user computing, but he feels that this move-
ment will be slower in his company than in other companies.

Therefore, he continues to place heavy emphasis on ensuring the most effective and efficient use of centralized I/S personnel.

In common with most other heads of information systems in our sample, he believes that "delivery of service" (CSF #3) is a critical success factor for I/S. The ability to deliver dependable, on-time, low-cost services is the bedrock upon which I/S stands. It is crucial to the success of the I/S function. Significantly, however, not only must I/S deliver good service, but it must also ensure that users perceptions of that service are in line with that reality (CSF #4). In fact, he says, good service, by itself, is not enough. It is necessary for users to perceive that the service is good in order to foster sound user relationships. These relationships are, in turn, necessary to further the user-I/S communication which will ensure that I/S priorities are aligned with the business. Thus we circle back to CSF #2.

Company B: A Major Bank

At the time of our interview, the executive in charge of information systems in Company B had only recently been recruited to his job from outside the organization. Previous to his arrival, the reputation of the information systems

function with regard to day-to-day service and on-time, within-budget development of new systems was less than satisfactory. His two top critical success factors (Exhibit 2), therefore, concern this situation.

First he feels that the development of high-quality, reliable service (CSF #1) is essential to his organization. In addition, he feels strongly that the now emerging results of his department's efforts to improve service must be fully understood by senior management in all user areas (CSF #2).

CSFs #3 and #4 in Company B originate from the I/S executive's deep belief that his function is in the process of a major change. This will be a rapid evolution from I/S "doing everything itself" to a role which will be increasingly oriented towards supporting end user efforts to develop many of their own reports and systems through the use of steadily improving end user programming languages. As a result he notes that "I have to change the people mix I have in information systems. We need more consulting-oriented people, who really like to work with line management. It will be critical for me during this decade to continually upgrade the quality of people in I/S while retaining the best that we already have" (CSF #3). Because

of this situation, he believes that the tools and techniques with which the I/S function works and the services it offers are going to evolve throughout the '80's. He feels he must ensure that the services his organization offers keep pace with both the needs of the users and the technical capabilities provided by the vendors (CSF #4).

Finally, the I/S executive of Company B feels that he must participate in the key top management discussions of the business and the directions it is to take (CSF#5). Such corporate involvement is necessary for him to assure that his organization is working on the appropriate priorities and providing the services that are required by the business as it grows and changes.

Company C: A High-Technology Manufacturing Company

The CSFs for the manager in charge of information systems in Company C are of particular interest, for he reports at the lowest level of any of the managers in our study. While all the others report either directly to the president or to a person reporting to the president, the information systems manager in Company C is "buried" with three managerial levels between him and the top executive officer. It is clear to him that he is viewed, and evaluated, as a functional manager, not as a participating corporate executive.

As a result, his most significant critical success factor is the implementation of two major new systems. "Although this is changing as a result of my efforts, there is no doubt in my mind that I am judged primarily on our ability to complete and install major new systems (CSF #1) as well as to provide ongoing service" (CSF #4).

The other critical success factors for this I/S executive, however, are aimed at changing this situation. He feels that the I/S function is evolving very quickly throughout the world, and should be in his corporation as well. "We need to move more rapidly toward better end user computing services, toward using I/S resources to provide information, not just paperwork processing, and to expand the ability of our line managers to better use information systems. The only way we'll get this done is if top management understands what I believe is the evolving role for I/S." As a result, his other critical success factors include top management communication (CSF #2), top management education (CSF #3) and human resources (CSF #5). The last of these is aimed at hiring individuals who can and do communicate with management regarding the need for new and better systems. However, he also expends a significant percentage of his own time in "the very critical process of helping top management to

understand that we are in a very different era of information

systems use, that the new technology presents a multitude

of opportunities for our company, and that we must organize

effectively and devote the necessary resources to take

advantage of these opportunities."

Company D: An Airline

In talking about his critical success factors, the

information systems executive in Company D struck several of

the same themes. Information systems service (CSF #2),

involvement in ensuring that the right systems are being

developed in line with corporate goals and priorities

(CSF #3), and changing the portfolio of services (CSF #6)

were all noted as critical to the success of the I/S function.

The information systems director in Company D, however,

was perhaps most eloquent on a single theme - the need for

I/S to provide technological leadership. This need was

directly expressed by three of his CSFs (#1, #3, #5). "Al-

though I report directly to the president, and am seen to

be one of the major candidates for his job, information

systems still has not taken its necessary stance in this

company. At the present time we are in the background. In

attempting to be responsive to user needs, we have become

too responsive. I believe it is critical for us in I/S to

use our information systems expertise to demonstrate to
top management and other line users how information tech-
nology can vastly affect our posture in the market place.
We are the only ones who fully understand computer tech-
nology and what it can do for this company. We must provide
corporate leadership in this area."

Further, by providing such leadership, this I/S exec-
utive intends to realize a secondary benefit - combatting
low I/S morale (CSF #4). "We have had a loss of I/S morale
as the function has become a backwater in this company. We
need good human resources to do the sorts of things we ought
to do. Taking a proactive stance will shore up this critical
area for us."

Other Companies

The same themes were reiterated in one way or another
in most of the nine companies. The reader can see this
by scanning the CSFs for companies E to I. These last five
companies will not be discussed in detail. Attention
should be given, however, to one "unusual" CSF.

The head of I/S in Company H is the only one at his
level in our sample to mention the need for better I/S
productivity. In discussing his CSF #4, he noted that in-
creased I/S productivity is absolutely essential for his

company. However, no other head of I/S directly mentioned "information systems productivity" as a critical success factor. Why? There appear to be three prime reasons. First, almost all noted at some time in the interview that it was more important to focus, with today's expanding technological opportunities and limited human resources, on selecting the "right things to do" rather than on improving I/S efficiency. In short, these executives seek to improve effectiveness rather than efficiency. Second, most believe that the hiring and retaining of key second-line information systems managers (a critical success factor for them) will lead to the development and use of productivity techniques by these lower level managers.

Finally, the executive in Company H is in a rather unique situation. Company H is located in a town geographically separate away from major metropolitan centers, where it is almost impossible to obtain additional information systems personnel. The I/S executive feels therefore, that he has to make the optimum use of a severely limited resource of available I/S personnel and must "install and make use of the best available productivity tools for both information systems professionals and for end users."

III. A CSF Set For I/S Executives

Previous work on critical success factors has demonstrated that particular industries have generic sets of CSFs.[4,5] More recent studies show that occupational roles also have sets of CSFs.[6] A manufacturing manager, for example, will have a generic set of CSFs which includes inventory levels, product costs, and efficient plant scheduling. Just as a particular company may have a set of CSFs that goes beyond the industry CSFs (due to its particular configuration of environmental, company strategy, and market position factors), a particular manufacturing manager may have a somewhat different set of CSFs than the generic model (because of the unique circumstances associated with his specific position in that particular company). However, just as each company must pay attention to industry-wide CSFs, every manufacturing manager must also attend to the generic CSFs of his manufacturing "role".

The case studies summarized in this research similarly suggest a set of role-related CSFs for I/S managers. Of course, since individual differences will exist from company to company, this generalized set can only serve as a "model" against which each company - and its I/S executive - can test its particular set of CSFs. Abstracting from the CSF

material generated in interviews at the nine companies, it appears that there are four CSFs for this type of I/S executive (Exhibit 3). They are service, communication, human resources, and repositioning of the I/S function.

Service

The first, and most obvious, I/S CSF is service. It appears, in one form or another, in the lists of almost all of our respondents. However, this CSF refers not only to the effective and efficient performance of necessary operations (for example, terminal response time or the on-time, within-budget development of information systems) but also to the perception of that service by user and corporate management. As a result, most of the managers in our sample have developed measurement devices to enable them to understand both the current status of their service and users' perceptions of that service.

Communication

Every I/S manager in our sample identified, in one way or another, one or more critical success factors associated with a strongly felt need to thoroughly understand the world of key users and top line managers, as well as to have them understand the I/S environment. It is important to note that this "communication CSF" concerns two-way communi-

cation. One communication direction is from the I/S manager
to the line. This involves the responsibility of I/S to
educate top management and key users about the potential
impact of information technology on their industry and their
company.

The other side of the information flow concerns the
communication of user needs and priorities to the I/S function.
As will be noted later, a sample of managers had a signifi-
cant number of processes (including planning, involvement
in top management councils, and interpersonal communication)
to facilitate this communication.

In short, in naming this particular CSF, these I/S
executives are underlining the death of the technically-
oriented, stay-in-the-office information systems chief. In
his place, they are affirming the birth of a new corporate
manager who is oriented towards active communication and
leadership in the use of information technology to meet
the full spectrum of business needs.

I/S Human Resources

The third generic CSF, we believe, is the human resource
in the information systems function. Almost all of the
managers interviewed stressed that the information systems
function is changing. As I/S moves away from accounting

applications (which require I/S personnel who are relatively unskilled interpreters of existing written rules and traceable processes as well as diligent coders of programs) to applications that assist executives to develop and use information data bases of their own, the characteristics of effective I/S people will change.

During the 1980s, there will be a need for a vastly increased supply of technically literate, but managerially competent, information systems people to help line management understand their own needs and build their own systems. The supply of such people is limited. The attraction of these people to, and their subsequent retention within, information systems is viewed as a critical success factor by all. At the same time, the I/S executives agree that it is also critical to retain and provide incentives for the best of the "COBOL-shop" personnel to develop further and maintain the existing massive paperwork processing systems. From any perspective, information systems is a people-intensive process. For any I/S manager, the quality of his people is a key ingredient in success or failure.

Repositioning The Information Systems Function

The fourth generic CSF is one of "repositioning" the information systems function. The process of "repositioning"

takes five major forms. All, however, contribute to the change in the I/S role from a limited "automated back office" to a more ubiquitous function involved in all aspects of the business.

One major step in "repositioning" is the provision of a new set of tools, techniques, and processes to allow managers and others to gain access to and use information as espoused in the decision support literature[7] and that of executive information support.[8] This part of the repositioning process takes the form of changing end user computing activity from the fringes of "data processing" to a more central role in the I/S function. Second, repositioning requires the increased involvement of information systems in the mainstream product line of the firm. It is obvious in banking and insurance that information systems technology is heavily involved in new product offerings today. However, most of the manufacturing firms in our sample have also extended their communication systems network to their customers and vendors. This extension of I/S capabilities not only facilitates the selection and sale of the company's products, but also provides increased service to its customers.

A third step in the repositioning of I/S is the inclusion of telecommunications as a fundamental part of the "in-

formation function". Computer based electronic mail, con-
ferencing, and teleprocessing are seen as vital weapons in
an organization's arsenal of information gathering, analysis,
and communication tools. In like manner, the fourth aspect
of repositioning is the integration of all the telecommuni-
cation, information processing, and information gathering
and dissemination functions (whether called "office auto-
mation", data processing, telecommunications, or whatever)
into a single functional unit. The point is that each of
these capabilities is part of an indivisible "information
function" and that this recognition is critical for each
organization involved.

Finally, many of the executives in our sample believe
that to carry out fully these steps, they will have to re-
position themselves in the organization structure from an
essentially line organization, with the bulk of the hard-
ware and systems development people under them, to an es-
sentially "staff" organization, with line computing respon-
sibilities distributed to various departments and divisions
of the organization. This organization restructuring is
necessary, they believe, to allow corporate I/S management
to focus on planning and executing all of the above re-
positioning processes.

In sum, the "repositioning CSF" is aimed at changing "data processing" into the "information function". It requires new techniques and processes as well as a revised organizational structure to accomplish the transition.

Variations From the Model CSF Set

Although this generic set of CSFs is readily apparent in the nine companies studied, the specific CSFs do differ from one I/S executive to another. Even some of the four "model" CSFs are absent from individual lists. This variation suggests that any particular head of I/S should not expect to have exactly the same four CSFs that were described in the generic set of I/S CSFs. Concomitantly, the definition of his current role may differ somewhat from the general model postulated here.

What is the cause of this variation in actual CSFs? In this study they seem to differ for four major reasons (Exhibit 4). The first, and perhaps most important, reason for differences in I/S CSFs is the stage of development of the I/S organization studied. Almost all of the nine companies in our sample were either in late stage three or in early stage four in Nolan's typology.[9] Subsequently, we have interviewed many other managers in the early portion of stage three, the control stage. Not unexpectedly, their CSFs fall

into a pattern that stresses "remaining within budgetry constraints" and various aspects of service delivery. The "repositioning" CSF found among our respondents is rarely, if ever, viewed as "critical" by these early stage three organizations.

Second, however, the recent organization history of the I/S function heavily influences each manager's perception of his own critical success factors. Companies in which service has been a problem often have service-oriented CSFs predominating, often to the exclusion of other factors. Those in which I/S personnel have been a particular problem will tend to stress the human factor. Third, the human, organization, and financial make-up of a company will also affect I/S CSFs. For example, I/S CSFs are different in organizations where top management is well aware of the technology and its implications as opposed to those companies where it is not.

Finally, the perspective or "world view" that the I/S executive has on the field and his role in his company is a very significant generator of CSFs. The CSF lists compiled above reflect the views of nine proactive, business-oriented

I/S executives. In subsequent interviews we have found a few I/S managers who believe that theirs is essentially an internally-oriented, responsive function. These managers tend to be more technically oriented and often play a re-active, rather passive role in their corporations. Their CSFs, as can be imagined, are quite different. Thus CSFs are, obviously, a reflection of an executive's perspective on his role. They will, and do, vary with the personality of the I/S director himself.

For all four of these reasons, I/S CSFs stated by the I/S executive will differ from company to company. It is up to such an executive, and his top management, to ensure the correct pace of evolution of the I/S role - with concomitant, mutually understood, shift in CSFs.

IV. Techniques to Ensure Performance

The mere statement that things are "critical" is not enough. One searches for evidence that this view of the job is being implemented as shown by managerial actions. It appears to be. In the companies studied a well-defined set of tools, techniques, and processes is in place to en-sure that significant managerial attention is given to critical areas. This section details the most widespread of

these managerial methods.

For the Service CSF, the most important approaches in these companies involve not only techniques for the actual delivery of service but also several which focus on measuring user perception of service delivery. These measurement devices are varied. They include: a daily "sign-off" inquiry presented to each on-line terminal user; monthly, quarterly, or annual surveys of user opinion through internally-generated questionnaires; and, in one case, a structured set of interviews administered by an outside consulting organization. These techniques are important since they not only allow the measurement of user perceptions but, in addition, permit the I/S executive to communicate the resulting, hopefully favorable, perception back to the users and to corporate management. In this way, the image of I/S, and therefore I/S credibility and its ability to affect corporate actions, can be maintained or improved.

The Communication CSF is supported by a wide-ranging set of techniques and processes which contributes to effective communication between our sample of I/S executives and their constituencies. Prominent among these processes is strategic planning. Each interviewee, with one exception, has an on-going strategic planning process as a means of communicating with his users about the nature of the I/S

environment and what they should jointly be doing to adapt
to and exploit it. The only executive who does not have a
well-defined process is in the railroad company. Even there,
an information systems strategy is developed - although
primarily through the intense relationship between the I/S
executive and the CEO.

A second essential aspect enhancing effective communi-
cations is that almost all of these executives report at or
near the peak of their organizational pyramid. As noted
earlier the one in our sample who did not was working in-
tensely to remedy this.

All but two of these executives have developed steering
committees for communication purposes. Generally, these
committees are seen both as a vehicle to understand user
priorities and to educate users and others in the organization
about what is happening in the I/S organization. These
executives have also placed emphasis on considerable informal
contact and communication within the organization. To
further this, several have established an I/S top management
team that consists of a chief executive officer - who is
responsible for contact outside the I/S organization - and
a chief operating officer who is responsible exclusively
for the management of internal I/S operations. This arrange-

ment, which several others are thinking of establishing as well, frees up the senior manager to interact with other senior managers around general issues of corporate management.

In addition, these I/S executives have begun to facilitate more effective communication with users by increasingly aligning their systems development groups directly with user or customer units. In doing so, they are, at the very least, moving away from a centralized, pooled organization of system developers to a system development organization structure that is aligned with specific functional or divisional responsibilities. In an increasing number of these organizations, the systems development staff reports, or will soon report, directly to the user division or departmental management. All of this is being done to ensure vitally needed system development personnel/user communication.

The Human Resources CSF is supported by several processes. All but one of the executives has established a career development process to provide support and incentives for the I/S staff. Many have a program for interchanging their I/S people with the rest of the organization. Line personnel are brought in to improve functional knowledge within I/S. Similarly, I/S staff are moved out to other parts of the organization, to enhance staff development, and

promotional opportunities. In addition, there is an emphasis in these I/S organizations on increasing the number of people with a generalist, managerial focus. Most have a program for hiring MBAs. Some actively promote an image of I/S as a reservoir of talented people for the organization, thus enhancing their own ability to recruit able, highly-motivated graduates. This has more than mere recruiting benefits. As one I/S executive put it, "the more knowledge I can get out there of our technical capabilities, and how to use them, the better off I am".

To ensure the Repositioning CSF for the new era of information management, these executives have engendered a wide range of approaches and techniques. They uniformly are placing an increasing emphasis on developing methods to manage data as a coporate resource. ~ Although none of them was entirely sure of the ultimate implications of this concept, they all emphasize its increasingly evident importance and the need to explore its possibilities. In addition, they are active in creating new methods to further the development of decision support systems for managers. Most of these companies also have either established or are in the process of developing separate end user support organizations as a responsive approach to users whose requirements are in-

creasingly oriented towards their own manipulation of available computerized data bases.

Finally, as noted briefly above, in most of these companies, there is an evident trend toward recasting the organization structure to reposition corporate I/S as primarily a staff organization. This is another reason why systems development people and hardware are being transferred to divisions and functional departments. Given this elimination of day-to-day line responsibility corporate I/S can focus its attention on developing the necessary tools, techniques, standards, and methods to facilitate the corporate-wide dissemination of computer technology. It can also work to plan and facilitate the necessary convergence of word processing, telecommunications, and related information technologies.

V. A "Profile" Of The Excellent I/S Manager

Just as stated I/S CSFs reflect an executive's view of his role, so does the same statement of CSFs mirror the executive himself. In analyzing each of the nine interviews an interesting pattern developed. Several common attributes of these executives were apparent (Exhibit 5). In effect, a common profile (or model) of these "excellent managers"

emerged - a profile which no one executive fit exactly,
but which describes each of them in most respects. That
profile is as follows.

With one exception, these I/S executives saw themselves,
and were seen, as corporate officers. All reported either
to the president or to a general manager (such as an exec-
utive vice president) who reported directly to the CEO. All
saw their roles as general business managers, not as infor-
mation systems technicians. With only one or two exceptions,
they viewed themselves as candidates for top line management
jobs in their organizations. (In fact, in the short time
since our study, two have been promoted to the top general
management position in a major division of their corporations.)

Additionally, all our respondents see the information
systems function as very significant to the success of the
company, and are constantly communicating this perspective
to others. They are all high profile people in the thick
of corporate discussions where possible. They view their
jobs as one of "getting the message across" to those who do
not have an understanding of the technology. Their wide-
spread image as company "leaders" throughout their organi-
zations facilitates this.

Like most effective line managers, they appear to enjoy

the "battle" to accomplish their aims. Almost all of the executives interviewed spoke often of his organization from a "political" perspective, as well as a "rational" perspective. Emphasis was often placed on the need to get key "power" individuals to understand and act in beneficial directions.

Finally, each I/S executive interviewed had a crisp, clear view of his own critical success factors. There was little, if any, hesitation in identifying a concise list of areas which were critical to his success. Moreover, the action plans which are being implemented to improve performance in each of these areas were at the tip of each executive's tongue.

In short, the managers interviewed have a well-defined perspective on I/S technology, and a clear vision as to where their corporations should be going with that technology. They have a strong sense of their roles in the corporation, and of the steps they must take to implement both their desired I/S strategies and their own personal strategies.

VI. Conclusion - The New I/S Executive Role

In attempting to define the new I/S executive role, we focused on three aspects of our sample of I/S executives - their CSFs, the key techniques and processes they use to

manage critical areas, and their common individual at-
tributes. Taken together, these provide a profile of an
aggressive, proactive, communication-oriented executive
who is focusing heavily on helping his organization to
adapt to a changing technical environment.

Today, this executive sees his role heavily oriented
to assuring that rapidly evolving technical opportunities
are understood, planned for, and implemented in his organi-
zation. This, in many cases, calls both for significant
changes in the way the organization does business and for
a significant evolution in his own job.

No longer can the I/S executive directly in medium-size
to large organizations "control" all the computer-based
activities of the firm. Increasingly, he must give away
day-to-day line responsibility to local I/S managers. He is
thus assuming the more staff-like role of his counterparts
in the industrial giants such as IBM and Exxon. Only through
this shift will he have the time to focus on the more "staff"
oriented tasks of I/S strategy, planning, standard-setting,
and the management of research into both technology directions
and the current application of the new technology into his
organization. Increasingly, he is a disseminator and "sales-
man" of ideas and techniques rather than the direct imple-

mentator.

Three of the four "model" critical success factors
(communication, human resource, management and "reposition")
directly reflect this evolving staff-oriented role definition.
In addition, in most cases our I/S executive sample has
decided that the fourth CSF - service - must be brought into
line with this new role. Operating responsibility for
local I/S units is increasingly being transferred to local
line managements. The top I/S executive today is increasingly
a "thinker, planner, and coordinator" rather than a direct
"implementor and doer".

EXHIBIT I

Companies Interviewed

Industry	Size
- RAILROAD	- $2 Billion Sales
- BANK	- Top 10
- INSURANCE	- Top 15
- AIRLINE	- Top 5
- MANUFACTURING	- $2 Billion
- MANUFACTURING	- $600 Million
- BANK	- Top 20
- MANUFACTURING	- $2.5 Billion
- MANUFACTURING	- $2.0 Billion

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EXHIBIT 2

Information Systems Executive's CSFs in Nine Companies

COMPANY A (Railroad)

1) Manage human resources effectively

2) I/S priorities aligned with business

3) Delivery of service

4) Users - especially the CEO - having favorable perceptions of I/S

5) Continued direct reporting link to the CEO

COMPANY B (Major Bank)

1) I/S service high quality, reliable

2) Communication of service quality and reliability to top line

3) High quality human resources in I/S

4) Ensure I/S services evolve with needs/capabilities

5) I/S executive (one) in top management inner circle

COMPANY C (High Technology Manufacturing)

1) Successful implementation 2 new key systems

2) Top management communication

3) Top management education

4) Meeting service standards

5) Human resources

COMPANY D (Airline)

1) Increased visibility for I/S within company

2) Good & better operating performance

3) More involvement in corporate planning process

4) I/S morale

5) Downplay responding to users; increasingly take leadership in helping users define info needs

6) Restructuring I/S in line with new technology

COMPANY E (Insurance)

1) Top management user contact maintained

2) I/S planning reviewed by other top management for approval, visibility

3) Provide planning role model for company

4) I/S planning -- I/S leadership

5) Increase user "direction" of I/S projects

6) Maintain managerial perspective

COMPANY F (Manufacturing)

1) Retention of trained, quality personnel

2) Ability to interact with top management

3) Improvement of "software/hardware"

4) Enhancement of job satisfaction for I/S personnel

5) Improved track record for delivery of products

6) Improved management control

COMPANY G (Bank)

1) Quality personnel

2) User & top management satisfaction, involvement

3) Efficient use of resources

4) Service levels (actual and perceived)

5) I/S value perceived by organization

6) New I/S role communication to top management

COMPANY H (Manufacturing)

1) Attract, train, & hold quality people

2) Effective planning

3) Top management communication

4) Utilization of best productivity tools

5) Internal & external recognition of MIS

6) Support from top management

7) Decentralization of MIS function

COMPANY I (Manufacturing)

1) Involvement in mainstream applications

2) Involved, active, knowledgeable users

3) Systems competence of people

4) Effective, efficient systems

5) High performance on perceived service levels

EXHIBIT 3

<u>CSF Set For I/S Executives</u>

- SERVICE

    - ACTUAL

    - PERCEPTION

- COMMUNICATION

    - TOP MANAGEMENT (Potentials, Needs, Priorities)

    - KEY USERS (Potentials, Needs, Priorities)

- HUMAN RESOURCES

    - QUALITY

    - INCENTIVE

    - RETENTION

- REPOSITIONING OF I/S

    - END USER COMPUTING

    - INVOLVEMENT IN MAIN AREA PRODUCT LINE

    - INCLUSION OF TELECOMMUNICATIONS

    - SINGLE "INFORMATION FUNCTION"

    - STAFF ORGANIZATIONAL STRUCTURE

EXHIBIT 4

Factors Causing Differences in CSFs

- STAGE OF DEVELOPMENT

- RECENT HISTORY OF I/S

- ORGANIZATIONAL FACTORS

- "WORLD VIEW" of I/S EXECUTIVE

EXHIBIT 5

Key Attributes of Model I/S Manager

- Reports to the president (or very high)

- Views self as a manager

- Views I/S as very significant to success of company

- Maintains High Profile - Communicates I/S potential
    and successes constantly

- Views the organization from a political perspective

- Focuses attention on his CSFs

Foot Notes.

[1] For a recent excellent experience-based effort toward explicating the role of the I/S executive today, see W. R. Synnott and W. H. Gruber, <u>Information Resource Management</u>, New York: John Wiley and Sons, 1981. Peter G. W. Keen also provides outstanding insights in "A Top Management Policy Perspective On Information Technology".

[2] John F. Rockart and Lauren S. Flannery, "The Management of End User Computing," CISR Working Paper No. 76, September 1981.

[3] John F. Rockart and Michael E. Treacy, "The CEO Goes On-line," <u>Harvard Business Review</u>, January-February 1982, p. 82.

[4] D. Ronald Daniel, "Management Information Crisis," <u>Harvard Business Review</u>, September-October 1961, p.111.

[5] John F. Rockart, "Chief Executives Define Their Own Data Needs," <u>Harvard Business Review</u>, March-April 1979, p.81.

[6] Christine V. Bullen and John F. Rockart, "A Primer on Critical Success Factors," CISR Working Paper No. 69, June 1981.

[7] See Peter G. W. Keen and Michael S. Scott-Morton, _Decision Support Systems: An Organization Perspective,_ Reading, MA: Addison-Wesley (1978). See also G. Anthony Gorry and Michael S. Scott-Morton, "A Framework for Management Information Systems," _Sloan Management Review,_ Fall 1971, p. 55.

[8] John F. Rockart and Michael E. Treacy, "Executive Information Support Systems," CISR Working Paper No. 65, November 1980 (Revised: April 1981). See also John F. Rockart and Michael Treacy, "The CEO Goes On-line," op cit.

[9] Cyrus F. Gibson and Richard L. Nolan, "Managing the Four Stages of EDP Growth," _Harvard Business Review,_ January-February, 1974, pp. 76-85.

REFERENCES

Bullen, Christine V. and Rockart, John F., "A Primer on Critical Success Factors," CISR Working Paper No. 69, June 1981.

Daniel, Ronald D., "Management Information Crisis," Harvard Business Review, September-October 1961, p.111.

Gibson, Cyrus F. and Nolan, Richard L., "Managing the Four Stages of EDP Growth," Harvard Business Review, January-February 1974, p.76.

Gorry, Anthony G. and Morton, Michael S. Scott, "A Framework for Management Information Systems," Sloan Management Review, Fall 1971, p.55.

Keen, Peter G.W. and Morton, Michael S. Scott, Decision Support Systems: An Organizational Perspective (Reading, MA: Addison-Wesley 1978).

Rockart, John F., "Chief Executives Define Their Own Data Needs," Harvard Business Review, March-April 1979, p.81.

Rockart, John F. and Flannery, Lauren S., "The Management of End User Computing," CISR Working Paper No. 76, September 1981.

Rockart, John F. and Treacy, Michael E., "Executive Information Support Systems," CISR Working Paper No. 65, November 1980 (Revised: April 1981).

Rockart, John F. and Treacy, Michael E., "The CEO Goes On-Line," Harvard Business Review, January-February 1982, p.82.