

A PRIMER ON
CRITICAL SUCCESS FACTORS

Christine V. Bullen

John F. Rockart

June 1981

CISR No. 69

Sloan WP No. 1220-81

Center for Information Systems Research
Sloan School of Management
Massachusetts Institute of Technology

TABLE OF CONTENTS

- I. Introduction
- II. Definitions and Concepts
- III. Interview Procedure and Data Analysis Technique
- IV. Analysis of Data

I. INTRODUCTION

Faced with an increasingly complex world, managers today are deciding that they need access to the information which is pertinent to their particular roles and responsibilities. One method of determining precisely what information is most needed is the "critical success factors" (CSF) method. Introduced in a Harvard Business Review article entitled "Chief Executives Define Their Own Data Needs" (1), the CSF method is now being utilized in a growing number of organizations. This paper is written to provide additional background on the method. Most particularly, it is written as a primer for those who would like to carry out CSF interviews.

Critical success factors are the few key areas of activity in which favorable results are absolutely necessary for a particular manager to reach his goals. Because these areas of activity are critical, the manager should have the appropriate information to allow him to determine whether events are proceeding sufficiently well in each area. The CSF interview method is designed to provide a structured technique which can be used by an interviewer to assist managers to zero in on their critical success factors -- and to determine the resulting information needs.

In order to gain a complete understanding of the CSF technique and its application, the reader should be thoroughly familiar with the original Harvard Business Review article. This primer assumes such a familiarity. Where

appropriate, the material presented here references that article rather than repeating ideas.

This document contains four substantive parts. The first section provides general background information on the critical success factor concept. The second section details the interview procedure. It emphasizes appropriate techniques for the interviewer to use in helping interviewees to think about and identify their CSFs. The final section concerns methods of analyzing the data.

The interview procedure section contains those techniques which we have found, in three years of using the method, to be most successful in drawing out CSFs. The two most important ingredients in successful CSF interviews, however, are the preparation and skills which the interviewer brings to the interview itself. The interviewer must be thoroughly prepared. He must have as deep as possible an understanding of the industry, the specific company, and the job being performed by the manager being interviewed. In addition, the interviewer should (through training or experience) have a command of basic interviewing skills.

The CSF interview involves a lively exchange of ideas. The interviewer must be comfortable in her preparation and energetic in her participation. In sum, the interviewer must have all the attributes and preparation of a good consultant. The more consulting skills that one brings to the task, the better the interview will be. Given this requisite preparation, the interviewer will find the CSF method to be

readily acceptable, interesting, thought-provoking and enjoyable.

One of the important strengths of the CSF method is that it provides the interviewer with a logical way of relating to and understanding the managers who are interviewed. Managers think in the terms used in the CSF interview. As a result, the CSF method allows the interviewer to comfortably extract the manager's view of the world. Most important, it enables the manager to easily identify those few matters which demand continuing scrutiny by him. The process, therefore, ultimately provides the interviewer with an understanding of what information will really be perceived as useful (and actually used) by each manager.

The CSF method is also of direct and immediate use to the interviewed manager. It assists her to explicitly focus attention on what is really important. All good managers have implicit CSFs which they have been using, most often subconsciously, to help them to manage throughout their careers. The interview method helps make these critical factors explicit. Once the CSFs are explicit, managerial priorities can be set more knowledgeably and improved allocation of the manager's resources, especially time, can be made. This result from a CSF interview is useful and can be accomplished far before the requisite information systems can be built.

The words "critical success factors" are beginning to take their place with other basic terms concerned with the

management of an organization. Like goals and objectives, CSFs appear at various levels in the management hierarchy. The next section therefore is aimed at placing the CSFs in their managerial context. Since this is written as a primer, we have tried to err on the side of over-simplicity. Some readers may wish to hurry through the next section where the material is very basic. CSFs and other managerial terms such as "strategy," "goals," and "objectives," will be defined, compared and contrasted. The CSF concept will be explored from many viewpoints. Finally, the hierarchical nature of CSFs will be illustrated through a set of examples.

II. DEFINITIONS AND CONCEPTS

The first part of this section defines critical success factors and places them within the perspective of basic terms concerned with the management of the organization. We then go on, in Part B, to provide additional conceptual background concerning critical success factors.

A. Definitions

1. Critical Success Factors (CSFs) - CSFs are the limited number of areas in which satisfactory results will ensure successful competitive performance for the individual, department or organization. CSFs are the few key areas where "things must go right" for the business to flourish and for the manager's goals to be attained.
2. Strategy - Strategy is the pattern of missions, objectives, policies, and significant resource utilization plans stated in such a way as to define what business the company is in (or is to be in) and the kind of company it is or is to be. A complete statement of strategy will define the product line, the markets and market segments for which products are to be designed, the channels through which these markets will be reached, the means by which the operation is to be financed, the profit objectives, the size of the organization, and the "image" which it will project to employees, suppliers and customers.

3. Objectives - Objectives are general statements about the directions in which a firm intends to go, without stating specific targets to be reached at particular points in time.
4. Goals - Goals are specific targets which are intended to be reached at a given point in time. A goal is thus an operational transformation of one or more objectives.
5. Measures - Measures are specific standards which allow the calibration of performance for each critical success factor, goal, or objective. Measures can be either "soft," that is subjective and qualitative, or "hard," that is objective and quantitative.
6. Problems - Problems are specific tasks rising to importance as a result of unsatisfactory performance or environmental changes. Problems can affect the achievement of goals or performance in a CSF area.

Figure 1 summarizes the above definitions and uses an airline company example to illustrate the relationship among the six terms. Figure 2 notes, although in an overly simplistic way, the hierarchy of relationships of each of these terms from the viewpoint of an individual line manager. (The interlinking of strategy and objectives at the corporate level is shown by including them in the same box. The remainder of the concepts fall hierarchically.)

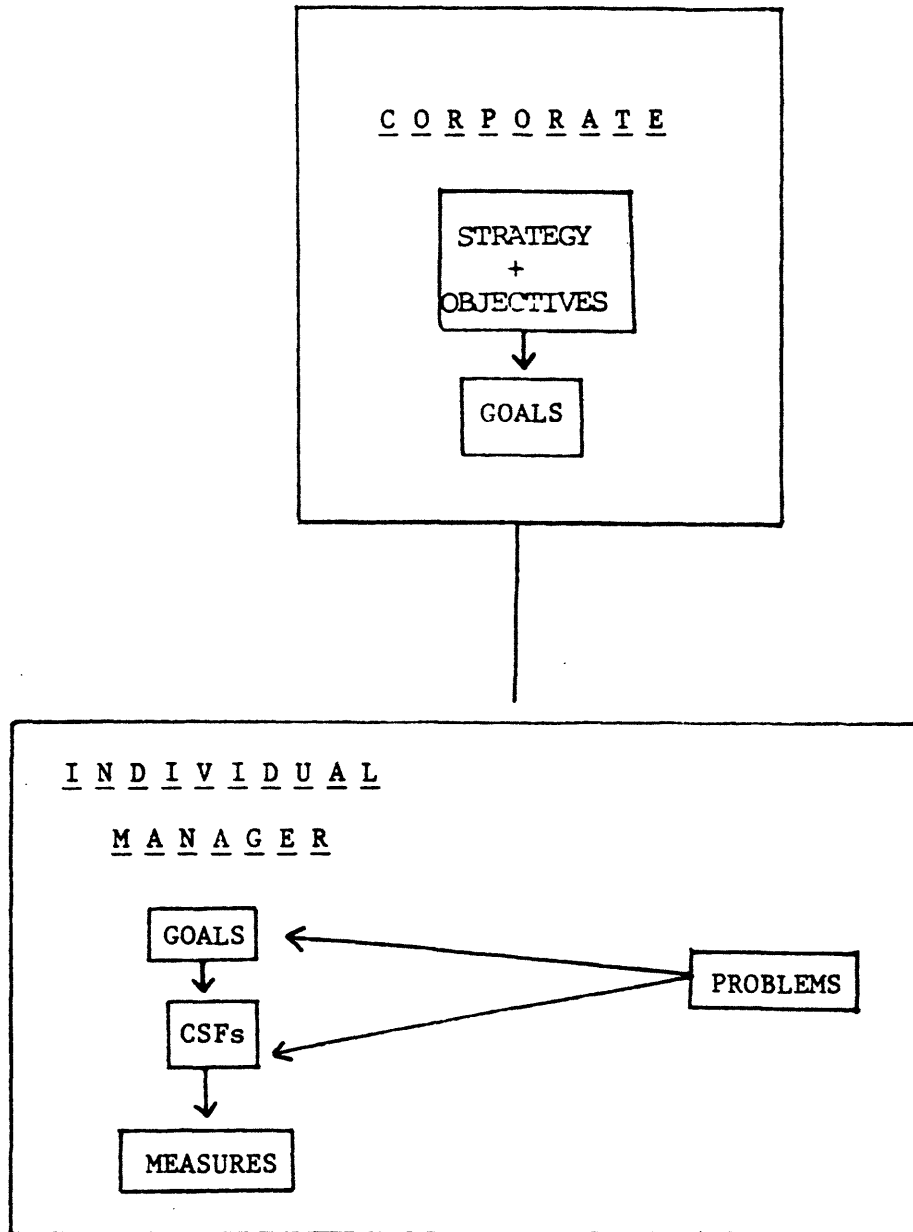
FIGURE 1

Comparison of Basic Terms in Airline Company Context

<u>Term</u>	<u>Brief Definition</u>	<u>Brief Examples</u>
Strategy	Basic decision of "what business are we in?"	Regional airline transportation
Objectives	General directional statements	Develop profitable route structure Change over to more fuel efficient fleet
Goals	Specific targets for a period of time	Eliminate all routes with less than "N"% average seat usage By year-end replace all "X" planes with "Y" planes Provide stockholders with 10% ROI in 1981
CSFs	Key areas where things must go right in order to successfully achieve objectives and goals	Obtain certification for higher-density routes Develop bank financing for new equipment
Measures	Calibrations of performance	Average % seat capacity used % of cash requirements under written equipment loan agreements with banks
Problems	Tasks resulting from unsatisfactory performance or the environment	Increasing price of fuel Future competition from video conferencing

FIGURE 2

Hierarchy of Management Concepts and Terms



B. General Background on CSFs

This section is aimed at providing a fuller understanding for the reader of what CSFs are and their role in the management process. Building on the definitions provided in the preceding section, this section will explore:

- (1) - The nature of CSFs
- (2) - The uses of the CSF concept with special attention to its key purpose -- information systems planning

(1) The Nature of CSFs. Terms like goals and strategy have a long and honored tradition in management literature. Their definitions are relatively precise today and the concepts are well understood. The same is not true of CSFs. What is or is not a critical success factor for any particular manager is a subjective judgement arrived at only after some thought. There is no clear algorithm which will aid an interviewer to assist a manager to find his CSFs.

Yet managers can, and do, determine their critical success factors. For those who have some difficulty in isolating their CSFs, a well-prepared, knowledgeable interviewer can assist greatly in the CSF-determination process. This section is designed to provide as much background as possible for potential CSF interviewers as to the "nature of the beast" with which they are dealing. Its aim is to supplement the material concerning the nature of CSFs found in the original Harvard Business Review article. We include material concerning:

- the importance of CSFs
- the need to "tailor" CSFs and information requirements to each individual manager's uniquely different situation
- the sources of CSFs
- a useful classification of CSFs
- the hierarchical nature of CSFs
- examples of CSFs

Let us look at each of these in turn.

(a) The importance of CSFs. Critical success factors are the relatively small number of truly important matters on which a manager should focus her attention. For this reason, the term "critical success factors" is aptly chosen. They represent the few "factors" which are "critical" to the "success" of the manager concerned. There are, in every manager's life, an incredible number of things to which her attention can be diverted. The key to success for most managers is to focus their most limited resource (their time) on those things which really make the difference between success and failure.

In general, there are, for any manager, only a very limited number of critical success factors. Examples are given in the original article. Additional examples will be found in the final part of this section of this paper. For most managers this limited set of important factors is far from a mystery. Most managers spend considerable time and energy both on the job and in their leisure hours thinking about these few areas of activity which are "close to the

bone." Much time is spent considering ways to improve performance in each of these areas. The value of the CSF process is to make these areas explicit, not merely implicit. They then can be used (as will be discussed more fully later) to aid in the company's planning process, to enhance communication among the firm's management, and to aid information systems development.

It is important for a manager to determine his goals -- which are the targets he will shoot for. That is common managerial lore. It is equally important, however, to determine, in a conscious explicit manner, what the basic structural variables are which will most affect his success or failure in the pursuit of these goals. These are the critical success factors.

Critical success factors are of sufficient importance that these key areas of activities should receive constant and careful attention from management. The current status of performance in each area should be continually measured and status information should be made accessible for management's use.

(b) Different managers - different CSFs - different information. CSFs are related to the specifics of a particular manager's situation. This means they must be tailored to the industry, the company, and the individual being interviewed. CSFs will certainly differ from manager to manager according to the individual's place in the organization's hierarchy. In addition, they often will

change as the industry's environment changes, as the company's position within an industry changes, or as particular problems or opportunities arise for a particular manager.

In this light, it is important to understand what CSFs are not. They are not a standard set of measures, sometimes called "key indicators," which can be applied to all divisions of a company. They are not limited to factors which can be reported on by solely historical, aggregated, accounting information. On the contrary, the critical success factor method looks at the world from a manager's current operating viewpoint. CSFs are the particular areas of major importance to a particular manager, in a particular division, at a particular point in time. They therefore demand specific and diverse situational measures, many of which must be evaluated through soft, subjective information not currently gathered in an explicit formal way by the manager's organization. No standard set of organization-wide "key indicators" can provide the necessary operating information.

(c) Five prime sources of CSFs. CSFs arise from five major sources which should be researched by a potential CSF interviewer during the preparation for a series of interviews. The sources of CSFs are:

- (1) The Industry. Each industry has a set of critical success factors that are determined by the characteristics of the industry itself. Each company

in the industry must pay attention to these factors. For example, from the Harvard Business Review article, there are four CSFs for the supermarket industry. The manager of each and every supermarket firm must be concerned about these four. They are product mix, inventory, sales promotion, price. The rationale behind this industry set can be found in the referenced article.

(2) Competitive Strategy and Industry Position. Each company within an industry is in an individual situation determined by its history and current competitive strategy. The company's resulting position in the industry dictates some CSFs. For example, a small company in an industry must almost always be concerned about protecting its particular industry niche. Similarly in an industry dominated by a single major firm, a CSF for all the others is understanding the leader's strategies and their probable impacts. In like manner, the geographic positioning of the company can also generate CSFs. For example, retail firms in rural areas may have transportation management as a CSF while for more urban companies this is less critical.

(3) Environmental Factors. Environmental factors are those areas over which an organization has little control. The organization must accomplish its mission while riding the tides of environmental

change. Two obvious environmental sources of CSFs are the fluctuations of the economy and national politics. Some companies are sensitive to additional factors such as population trends, regulatory trends, and energy sources.

(4) Temporal Factors. These are areas of activity within an organization which become critical for a particular period of time because something out of the ordinary has taken place. Normally these areas would not generate CSFs. For example, a crisis such as the loss of a large number of executives in an airplane crash would generate the short term CSF of "rebuilding the executive group." Similarly, while inventory control would not normally appear on the list of CSFs for a CEO, it could become a CSF for him under extreme circumstances of over or understocking.

(5) Managerial Position. Each functional managerial position has a generic set of CSFs associated with it. For example, almost all manufacturing managers are concerned with product quality, inventory control and cash control.

(d) A useful classification of CSFs. One useful way of looking at CSFs is illustrated in Figure 3. Each CSF can be classified along three major dimensions. These are (1) internal versus external, (2) monitoring versus building-adapting, and (3) all the five sources discussed just above. All three dimensions are ways of categorizing

CSFs. The pattern of CSFs which emerge provides a good insight into a manager's world view. But the resulting pattern can also serve an interviewer as a source of questions. The two dimensions not yet discussed are:

(1) Internal versus external -- Every manager will have internal CSFs relating to the department and people she manages. These can run a very wide gamut, including such diverse things as human resource development and inventory control. The primary characteristic of internal CSFs is that they deal with issues and situations within the manager's sphere of influence and control. External CSFs however, pertain to situations generally less under the manager's control. For example the availability or price of a particular critical raw material is an external CSF.

(2) Monitoring versus building/adapting -- Managers who are oriented toward emphasizing near term operating results invest considerable effort in tracking and guiding their organization's performance. Monitoring CSFs involve the continued scrutiny of existing situations. Almost all managers have some monitoring CSFs. Often these include financially oriented CSFs such as actual performance versus budget or the current status of product cost. Another monitoring-oriented CSF might be personnel turnover rates.

Managers who are either in reasonable control of day-to-day operations, or who are insulated from fire fighting concerns, spend more time in building (or adapting) mode. These people are future-oriented planners whose primary purpose is to implement major change programs aimed at adapting the organization to a perceived new environment. Typical CSFs in this area include the successful implementation of major hiring and training efforts or new product development programs.

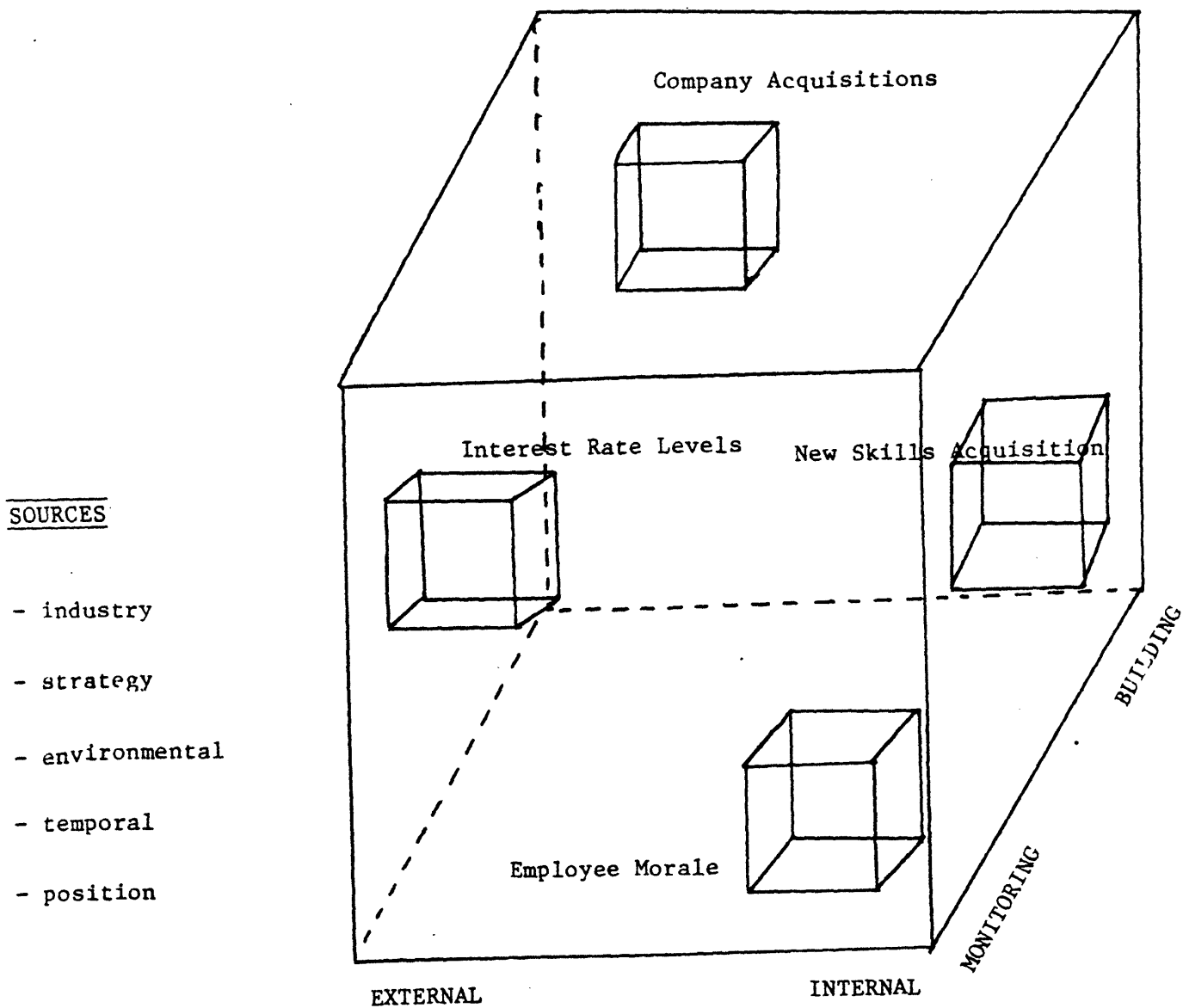
In general, managers will have a mix of both monitoring and building/adapting CSFs. However, there is usually a strong tendency toward one of these quite different types of CSFs.

This three dimensional classification can be used to visualize the clustering of a particular manager's CSFs by combining the characteristics as shown in the illustration in Figure 3. For example, "Company Acquisitions" is an external, building CSF whose source is competitive strategy. "New Skills Acquisition" is an internal, building CSF arising from competitive strategy. "Employee Morale" is an internal monitoring CSF, probably temporal, coming out of a current problem area. "Interest Rate Levels" is an external, monitoring CSF, generated by the environment.

We will note later in the section on "The CSF Interview" that an interviewer can use this classification process with good effect in evaluating the results obtained from a CSF

FIGURE 3

MAJOR DIMENSIONS OF CRITICAL SUCCESS FACTORS



interview.

(e) The hierarchical nature of CSFs. From an individual manager's viewpoint, there is a set of his own CSFs on which the manager must primarily focus. From a company viewpoint, however, one can discern four different hierarchical levels of critical success factors, each of which must be considered. These are:

- industry CSFs
- corporate CSFs
- sub-organization CSFs
- individual CSFs

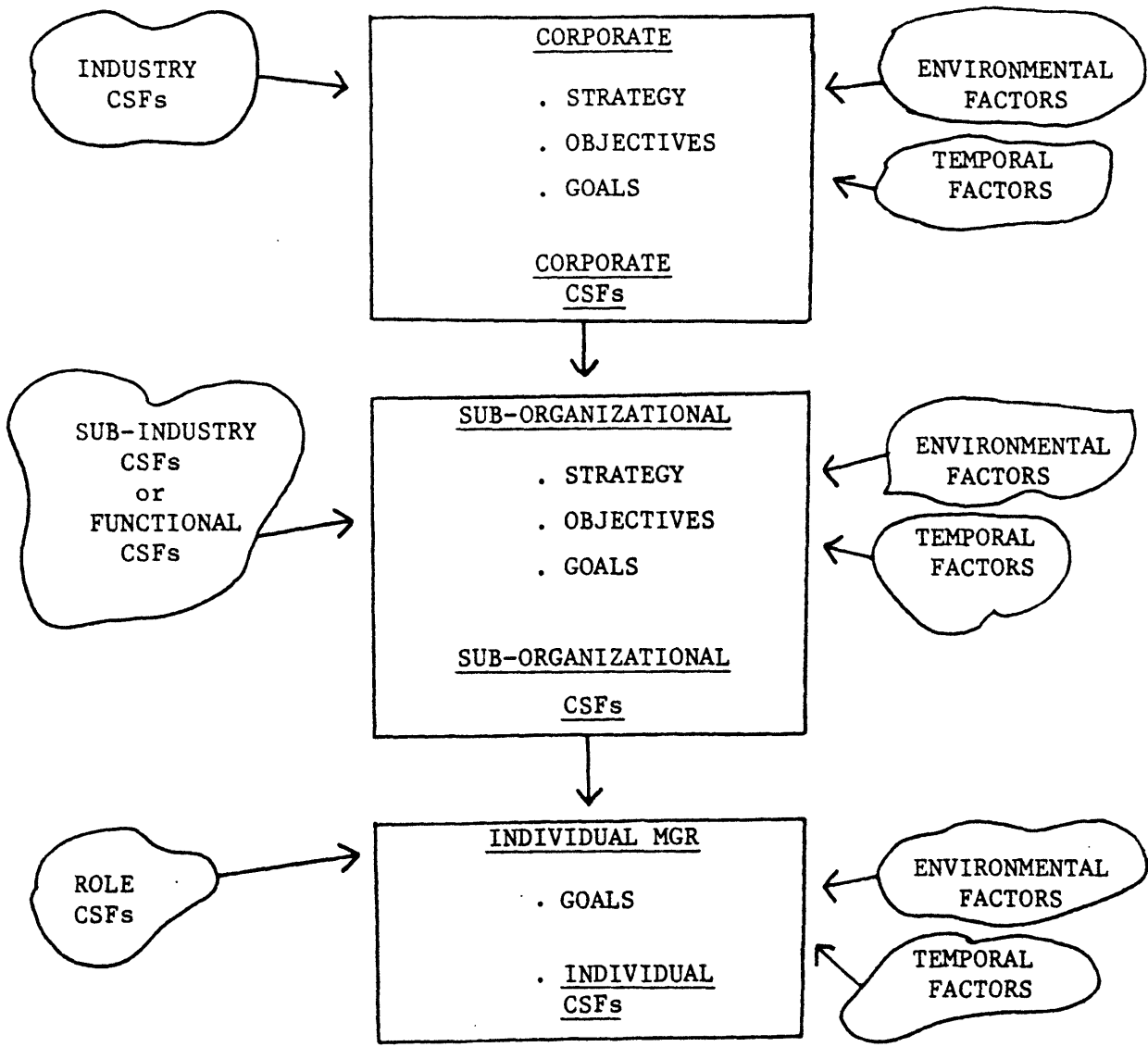
As Figure 4 suggests, industry CSFs affect each organization in an industry in the development of its strategy, objectives, and goals. No organization can afford to develop a strategy which does not provide adequate attention to the principal factors which underlie success in the industry.

In turn, the strategy, objectives, and goals developed by a company lead to the development of a particular set of critical success factors for the corporation (corporate CSFs). Given its strategy and objectives, as well as the other factors in its specific environment (see the automotive and computer industry and company examples in the following section), each corporation will develop a set of CSFs unique to its own circumstances.

In turn, corporate CSFs become an input into a similar CSF determination process for each sub-organization in the

FIGURE 4

FROM A CORPORATE VIEWPOINT

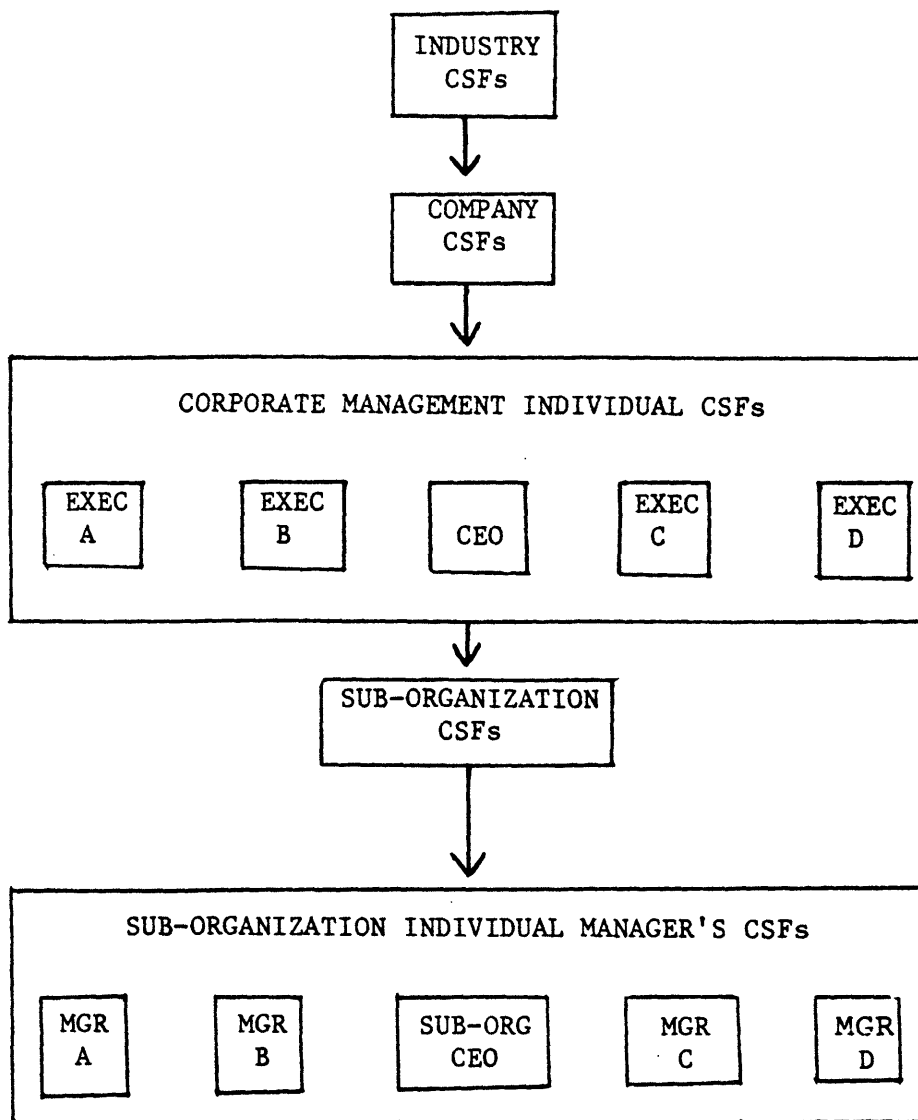


corporation. The analysis of sub-industry CSFs (where appropriate), corporate strategy, objectives, goals, and CSFs, and its own strategy, objectives, and goals, as well as environmental and temporal factors lead to a set of sub-organizational CSFs for each sub-organization in the company. The process can be continued for as many levels of organizational hierarchy as exist. Note that each sub-organization, whether a division or a function, will be affected in its development of strategy, objectives, goals and CSFs by its own particular environmental and temporal factors as well as by the strategy, etc. of the next higher organizational level. Divisions will be affected by their sub-industry CSFs, functions by their functional role CSFs.

Managers at each of the organizational levels will have an individual set of CSFs which depend heavily upon their particular roles and on temporal factors, and less heavily upon the industry and the environment. (See examples next section). Each of these individual sets of CSFs must be determined in the light of all the higher level managerial developments concerning strategy, objectives, goals and/or CSFs.

From the viewpoint of CSFs alone, the hierarchy can be shown as illustrated in Figure 5. Conceptually, industry CSFs (at the top) heavily influence each company's CSFs. In turn, the company CSFs will play a significant role in determining the CSFs of the CEO and all other executives at the corporate level. Each executive, however, will have

FIGURE 5
THE CSF HIERARCHY



individual CSFs, depending on his particular role and responsibilities. This top-down influence pattern is then repeated at each sub-organizational level.

In theory, the development of CSFs should be from top-down. However, where corporate or sub-organization CSFs have not been explicitly developed, they can be inferred upward from a careful analysis of each individual manager's stated CSFs. (We will return to this in section III.)

(f) Examples of CSFs. Several examples of critical success factors are provided in the original article. This section is aimed at providing further structured examples to develop a fuller understanding of industry CSFs, organizational CSFs, and individual CSFs.

1. Industry CSFs

In this section we will discuss the U.S. automotive industry, and the computer industry. These two industries are useful vehicles for illustrating industry CSFs since they clearly point out the two prime characteristics of industry CSFs. These two characteristics are:

- Industry CSFs are determined by the technical and competitive structure of the industry as well as the industry's economic, political and social environment.
- As these factors change, the industry's CSFs will change.

a. U.S. Automotive Industry.

The automotive industry's CSFs, originally defined two

decades ago, have seen at least two significant changes since that time. We look here at an original definition and the two subsequent changes.

Original CSFs - 1961. The first discussion of CSFs in the U.S. automotive industry was by Daniel in 1961 (2). At that time he noted three critical success factors. These were:

- Styling
- Quality Dealer System
- Cost Control

Americans had always been highly influenced in their car purchase choices by styling. The major U.S. automakers battled each model year to out-style each other. Can anyone ever forget the great tail-fin era? It was clear that styling was a critical success factor in the early 60's for every company in the automobile industry.

A second CSF noted in 1961 was the quality of the dealer system. The automakers' direct representative with the consumer is the car dealer. Not only do initial sales depend heavily on the dealer's quality, but follow-up contact through servicing is a constant reinforcement of the relationship. Good reinforcement leads to future new car purchases.

Cost control was the third industry CSF noted by Daniel because profit per automobile (and therefore total earnings for each company) is heavily influenced by cost control. Since pricing is dictated primarily by competition, the more

efficient the production and assembly line, the greater the profit.

A change in industry CSFs - 1976/7. When we initially updated this discussion of CSFs in the U.S. auto industry in 1977, we included these three CSFs, but added a fourth -- meeting energy standards. At that time, energy standards had become a CSF in the industry due to government-imposed pollution control standards. This was then an example of an environmentally generated CSF. Increasingly today this CSF has gained additional status as car buyers have added a new dimension to it. When fuel supplies were "limitless" and inexpensive, fuel economy was not an issue. Consumers today demand fuel economy, however, in the same way that they demanded styling twenty years ago. Thus, meeting energy standards is today doubly critical. In 1977, then, the industry CSFs were seen to be:

- Styling
- Quality Dealer System
- Cost Control
- Meeting Energy Standards

Yet another change - 1978. Throughout 1977, disturbed only by the initial oil crisis in 1973/4, Americans continued to demand large cars. When in 1976 General Motors introduced the most fuel-efficient car on sale in the country, the Chevette, that car did so poorly in the market that it was being called "the Edsel of the 70s." In 1976 and 1977, the big three automakers had to close small-car plants while

their big-car plants were on double-shifts trying to keep up with the demand.

The second oil price surge in 1978, however, finally made a difference with the North American consumer. His image of the automobile as a stylish projection of his own personality changed, for most people, to a view of the car as a means of efficient transportation. (For the few who can afford it, however, one suspects the old image still lingers on. But the new view predominates.)

Thus, the industry CSFs have changed once more. It makes sense to remove "styling" from the list, and replace it with "image" where the image must be essentially one of quality and fuel efficiency. The U.S. automakers appear to have finally caught on to these new CSFs. They are attempting to lure buyers through improving on an image formerly attributed to foreign automakers. Foreign car dealers have succeeded in the past decade by creating an image of efficiency and reliability tinged with romance. U.S. automakers are now attempting to "one-up" this consumer perception by projecting a new image for the 80's combining efficiency, reliability, ease of maintenance, comfort and patriotism.

Thus in 1980, we have a different set of industry CSFs. They are now:

- Image
- Quality Dealer System
- Cost Control

- Meeting Energy Standards

This evolution in automobile industry CSFs illustrates well the point that industry CSFs will change, sometimes in major ways, with shifts in the environment in which the industry exists. As economic, political, social or competitive conditions change, the industry CSFs will change. To understand the current set of CSFs for an industry, one must closely analyze all these factors, with particular attention to the changes that are taking place.

b. Computer Industry

In this dynamic, growth industry there are five industry CSFs at the present time:

- Choice of Market Niche
- Technological Leadership
- Orderly Product Development
- Service and Stability
- Attraction and Retention of Quality Personnel

As a result of its youth and growth, this industry is extremely complex. In years to come it may devolve into several different industries. However, at this point, with the industry considered as a whole, it is imperative for a company to have a basic strategy, which answers the question, "What business are we in?" For many years, the sheer growth of the industry allowed almost any company to prosper. However, recently as competition has become increasingly severe, companies are beginning to fail because they have not clearly defined the market niche appropriate to their

particular skills, size, etc. Without a clear definition of the business, an organization cannot create well-defined strategies, objectives and goals, and therefore most probably cannot succeed in the 80s.

Most successful new entrants into the computer industry concentrate on a new technology or a particularly creative adaptation of existing technology. This technological leadership (within its niche) makes it possible for a new company to get off the ground. Maintaining technological leadership will help to ensure success.

Once the strategic decision has been made with respect to the basic business niche, the orderly development of products for that market sector must be planned. As the industry's available technology improves, each company must upgrade its offerings. In turn, the company's customer base must be lead smoothly through successive transitions to each new technology. Orderly product development thus must be based on such things as technological advances, growth in existing customer sophistication, changes in customer needs, and the need for the company to expand its markets. Coordinating the availability of new products with financing and market demand is a key issue in this CSF. Another is managing the growth of the business.

A major CSF for all companies in the industry, because of the past history of growth and instability, is the ability to provide ongoing high quality service. Data processing is increasingly intertwined with the most vital operations of

the firm. Networks for major companies extend world-wide and into some very remote locations. Customers are concerned about the vendor's stability and whether their investment will be supported with service. There is yet another factor which has generated this "quality of service" CSF. The industry leader, IBM, has always maintained an excellent reputation for service, worldwide. It has therefore set a high standard in this area for companies in the industry.

The final industry CSF is attraction and retention of quality personnel. Competition for good people among the companies in the industry is fierce. Traditionally, there has been a shortage of qualified people. This has lead to high mobility, a short average tenure of position, and escalating salaries. Quality personnel are the foundation of an industry based on technology. Therefore the ability to attract and retain the skills needed to create, market, and service the products is an important CSF.

2. Organizational CSFs

As Figure 4 suggests, industry CSFs are one input -- and a very large one -- into the CSFs for particular organizations. However, each corporation has other environmental, strategic and temporal conditions which also drive its CSFs. Working externally from the company, one can only estimate the effect of all these factors on the company's CSFs. This, however, is what this section attempts given our knowledge of four companies in the automotive industry and one in the computer industry. This last

computer-industry company is analyzed in some depth to provide the reader with an extensive description of "organization" CSFs at the corporate level.

We deal primarily with the corporate level in this section. CSFs for sub-organizations (with their own sub-industry, environmental, strategic and temporal conditions) could be described in exactly the same manner. The analytical process is the same.

a. Automotive Industry

As Figure 6 shows, each of the four companies noted must include the industry CSFs as part of their CSF list. Each, however, has an additional CSF which arises from its particular approach to, or position in, the industry.

Within the industry, individual automakers have differing CSFs based on market niche, temporal problems, and competition. AMC, through its JEEP division has the largest share in the four-wheel drive market. This market provides a heavy share of AMC's profits. Maintaining the lead in this market niche is therefore one of AMC's CSFs.

Chrysler has a serious cash flow problem. They have an immediate, temporal (they hope!) CSF of obtaining enough cash to keep the production lines rolling. Ford and GM have chosen to meet the foreign competition head on, and are currently coming out with new product lines of small, economical, front-wheel-drive cars. Their common additional CSF is to successfully compete in this small-car market.

Any critical success factors list for any company will

show the industry CSFs reflected in the individual company CSFs list. It will also show, however, that each company will have some individual CSFs which exist apart from the industry-wide ones.

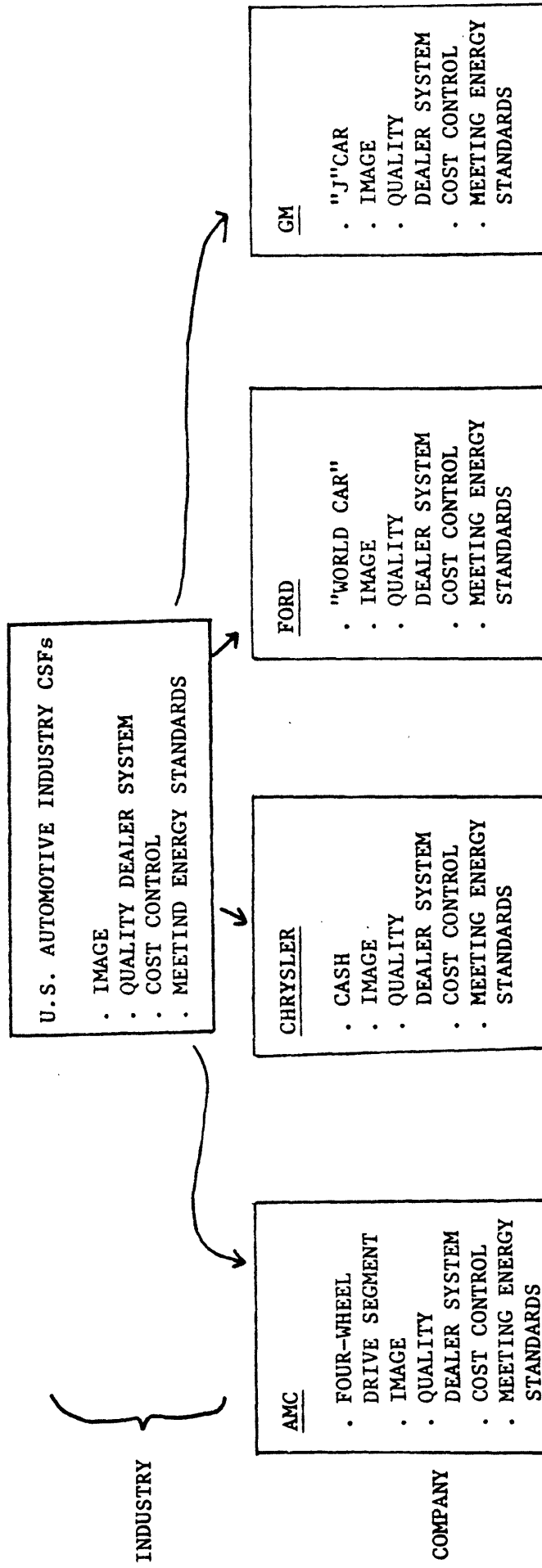
b. Computer Industry

Recently we were asked to put ourselves in the shoes of the president of a major computer company (which we will call "The Computer Company" and to describe the CSFs we would see for that company. Since the philosophy of CSFs requires that they are based on the current strategy being followed by the company, the major objectives being pursued, and the personal world view of the top corporate officers, the following can only represent an outsider's view of all of these. Therefore, the CSFs noted are, at best, an outsider's evaluation of what that company's top officers might list as CSFs for the company at the current time. But they do provide an extensive illustration of one company's "organizational CSFs".

(1) Market Understanding. The company deals in a rather complex marketplace and one which is shifting significantly. The emphasis is clearly changing from the processing of accounting transactions on large central machines to an increased emphasis on on-line transaction processing for operations, and to what we term decision support (or information support) for line managers, staff professionals and even clerks. Office processing and message processing are becoming increasingly important. Software development is

FIGURE 6

INDUSTRY AND COMPANY CSFs



changing from an emphasis on "build your own" to "buy" and the use of multiple-use software in its several forms. Perhaps most important, the need is clear in the 1980's for computer companies to provide good networking capability (both hardware and software) in a market place which will be increasingly communication-oriented.

Given the above complexity and change, an understanding of the real needs of the marketplace by the company is most critical. Available, but limited resources must be spent to produce the products which are most needed. Resources are limited even for this large company. Although it has attempted in the past to span much of the market with at least some presence, it must have market understanding to select the major key market segments appropriate to it.

(2) Insightful/Competitive Analysis. One way to understand the market is through the analysis of competitors. This analysis provides some input into the market segment selection process discussed in CSF #1. More critical, however, is analysis of competitive threats. The major new one obviously is Japan -- which has significant muscle (through both private resources and government assistance) and appears to be a growing threat to the company and the other major companies in the industry in the next decade. Proper understanding of Japanese intentions and the development of counter-strategies are necessary - for the computer industry is perhaps the major Japanese target over the next decade.

(3) Technological "Leadership". Market understanding without the development of the appropriate technology is less than useful. Moreover as computers increasingly become a "commodity," the maintenance of a technological edge (or at the very least parity) with the competition becomes increasingly necessary. It is also important for purposes of CSF #4 which follows immediately.

(4) Developing an Image. The company has never had a clear image in the computer industry. At times it has provided product leadership. At yet other times it has focused on particular industries. At other times it has been seen as an "alternative source" to the industry leader, IBM. In the marketplace this changing purpose has lead to a less than robust image in the past. Internally, it has provided the potential, at least, for low morale. A decision on its market segment (CSF #2) and therefore its image (this CSF) appears critical at this increasingly competitive time in the industry.

(5) Developing a More Effective Corporate Marketing Staff. The company appears to have decided to be a major factor in the market place. Yet it has operated in a "lean and thin" manner. To gain better market and competitive understanding, it is very important to establish and develop a significantly larger and upgraded corporate marketing staff.

(6) Quality People. This is the driving force in every successful company. The Computer Company has done well in

the market place by attracting and keeping high quality employees. The need for increasing productivity in the industry makes this even more important today.

(7) Service and Stability. This is an industry CSF which is an industry "must". As explained in the industry discussion above, it is increasingly critical today.

Figure 7 shows how each company-specific computer company CSF relates to the computer industry CSFs previously discussed. CSFs 1,2,3,6, and 7 tie directly to industry CSFs. CSF #4 "Developing an Image" is a temporal CSF specific to the company and therefore does not appear on the industry list. CSF #5 "Developing a More Effective Corporate Marketing Staff" is another company specific CSF whose source is corporate strategy.

It should be clear from this example how one can fit some individual company critical success factors into the context of industry wide CSFs. In addition some CSFs are generated from the sources discussed previously.

3. Individual Manager CSFs

Just as there exist individual company CSFs, there are CSFs for each sub-organization within a company, that is each division, department, group, etc. And at every level of the organization there are a set of people, each of whom have individual CSFs.

As Figure 4 noted, "individual manager" CSFs are affected by several factors. Heavy influences on individual's CSFs include role-related and temporal factors.

FIGURE 7

COMPANY CSFs AND INDUSTRY CSFs

THE COMPUTER COMPANY CSFs

INDUSTRY CSFs OR SOURCES

- | | |
|--|--|
| 1. Market Understanding and Creation | Market Niche |
| 2. Insightful Competitive Analysis | Market Niche |
| 3. Technological Leadership | Technological Leadership |
| 4. Developing an Image | Temporal CSF |
| 5. Developing a More Effective Corporate Marketing Staff | Temporal CSF from Company Strategy |
| 6. Quality People | Attraction and Retention of Quality People |
| 7. Service and Stability | Service |

Role-oriented CSFs cut across all industries. They are an integral part of the job itself and therefore persist regardless of pressures produced by other factors. For example, manufacturing managers invariably list quality control and cost control as CSFs. Presidents always have "Corporate Performance" in one form or another as a CSF. In performing a CSF study, it is important, therefore, to closely examine each individual's role.

Temporal factors for each manager are usually related to the current problems and opportunities which the manager is facing. This area is therefore an important source for CSFs. For example the president of a large commercial bank would not normally review all loans to developing countries. However, the dynamic political environments today in many such countries may cause the portfolio of these loans to become a problem, and therefore, generate a CSF for the president. In performing the CSF study, the interviewer should look at the problems and opportunities facing a manager, and how she is dealing with them.

Other factors which generate CSFs for individual managers include strategy, objectives, goals, and CSFs from organizations and individuals above them in the corporate hierarchy. If, for example, a VP Marketing has set a goal of increasing overall sales by 25% in the coming year, the marketing managers for each product line will have both goals and CSFs related to achieving that goal.

Individuals are also affected by the organization's

environment and industry, but to a lesser degree. For example, whereas the overall corporate CSFs can be enormously influenced by new competition conditions in the industry, more of a particular product line manager's CSFs will be generated by the resulting corporate strategy, than by the competition itself.

To return to the computer industry, we can look at the example of the financial vice presidents of three dynamic, growing companies like DEC, Prime and Apple. The managers all have at least one CSF in common -- financing for growth and expansion. All three are managing in organizations which have grown rapidly during their lifetimes, and are doing so in a tight money economy. This CSF is role-oriented, arises from corporate strategy, and is temporal because of the current economy. How each vice-president solves his particular problem will no doubt be different. (Apple, for example, went public in December 1980 to increase its cash available for growth.)

Figure 8 completes the hierarchy of CSFs for one company from the auto industry example, Chrysler, by reproducing the industry CSFs, organizational CSFs, and adding three sets of individual CSFs. The emphasis on role and temporal CSFs below the level of President (where CSFs are about identical with those of the corporation) should be noted.

2. Uses of the CSF Concept. Having discussed the CSF concept and placed it in relationship to other managerial concepts, we now turn to a discussion of the three major uses

of the concept. These are:

- To help an individual manager determine his information needs
- To aid an organization in its general planning process -- for strategic, long range and annual planning purposes.
- To aid an organization in its information systems planning process.

Attention will be concentrated in this paper on the last of these uses. The first is discussed in depth in the original Harvard Business Review article. The reader who is specifically interested in it should review that article after reading the next section. The second use (as an aid in general corporate planning) is not the focus of this primer which is targeted toward the information systems field. Thus the "general" planning use of CSFs will also be treated relatively lightly. We will concentrate on the third use -- information systems planning -- which is today the primary use of the CSF concept from our perspective.

a. Determining an Individual Manager's Information Needs

As Figure 9 suggests, an individual manager lives within the context of a corporation and her own sub-organization. Where strategies, objectives and goals exist at higher levels (and in most major organizations they do today), the individual manager must pay attention to these in determining her own goals. These goals, in turn, are the backdrop for the determination of the factors which are critical in

FIGURE 8

THE RELATIONSHIP OF COMPANY AND INDIVIDUAL CSFs

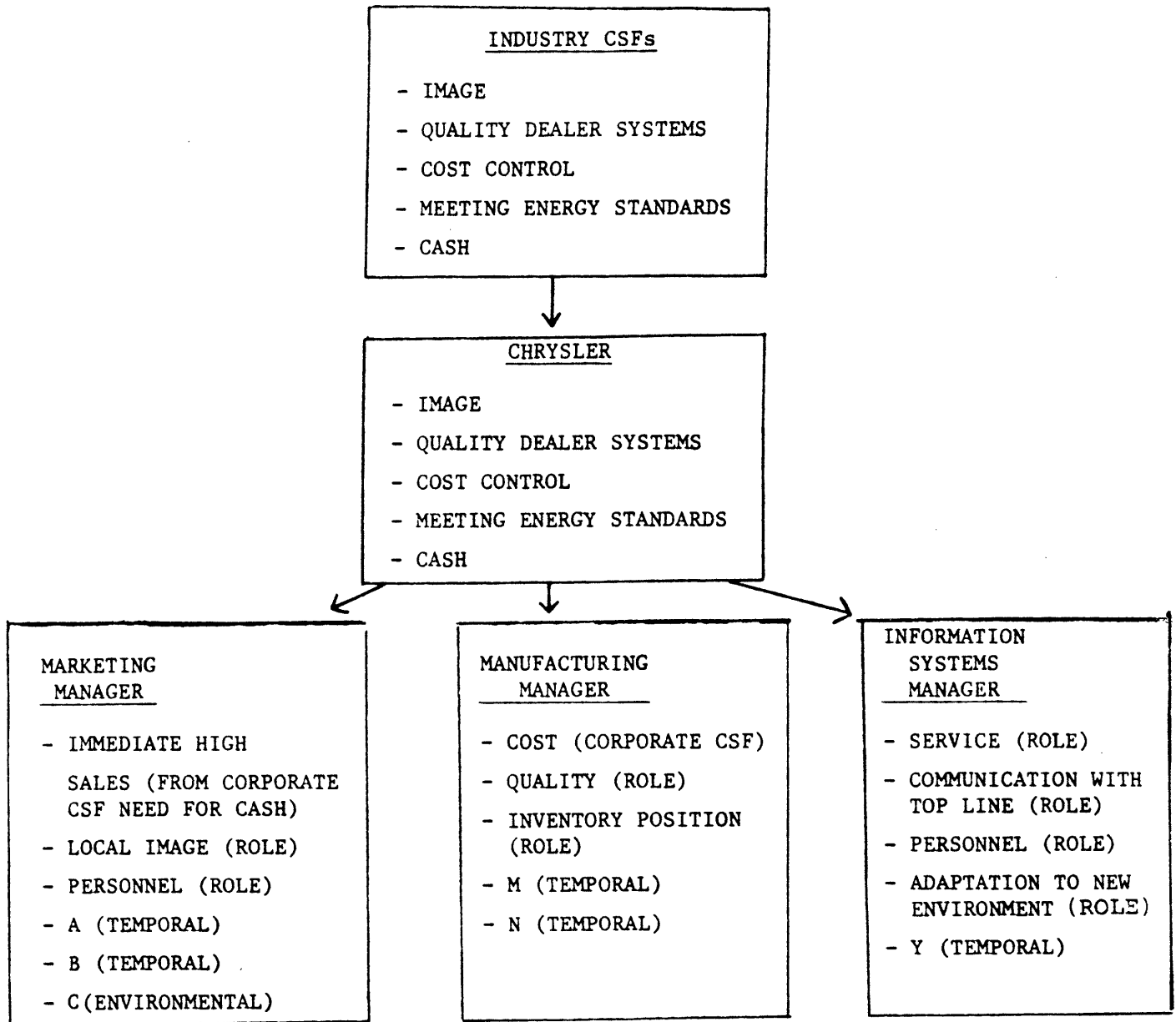
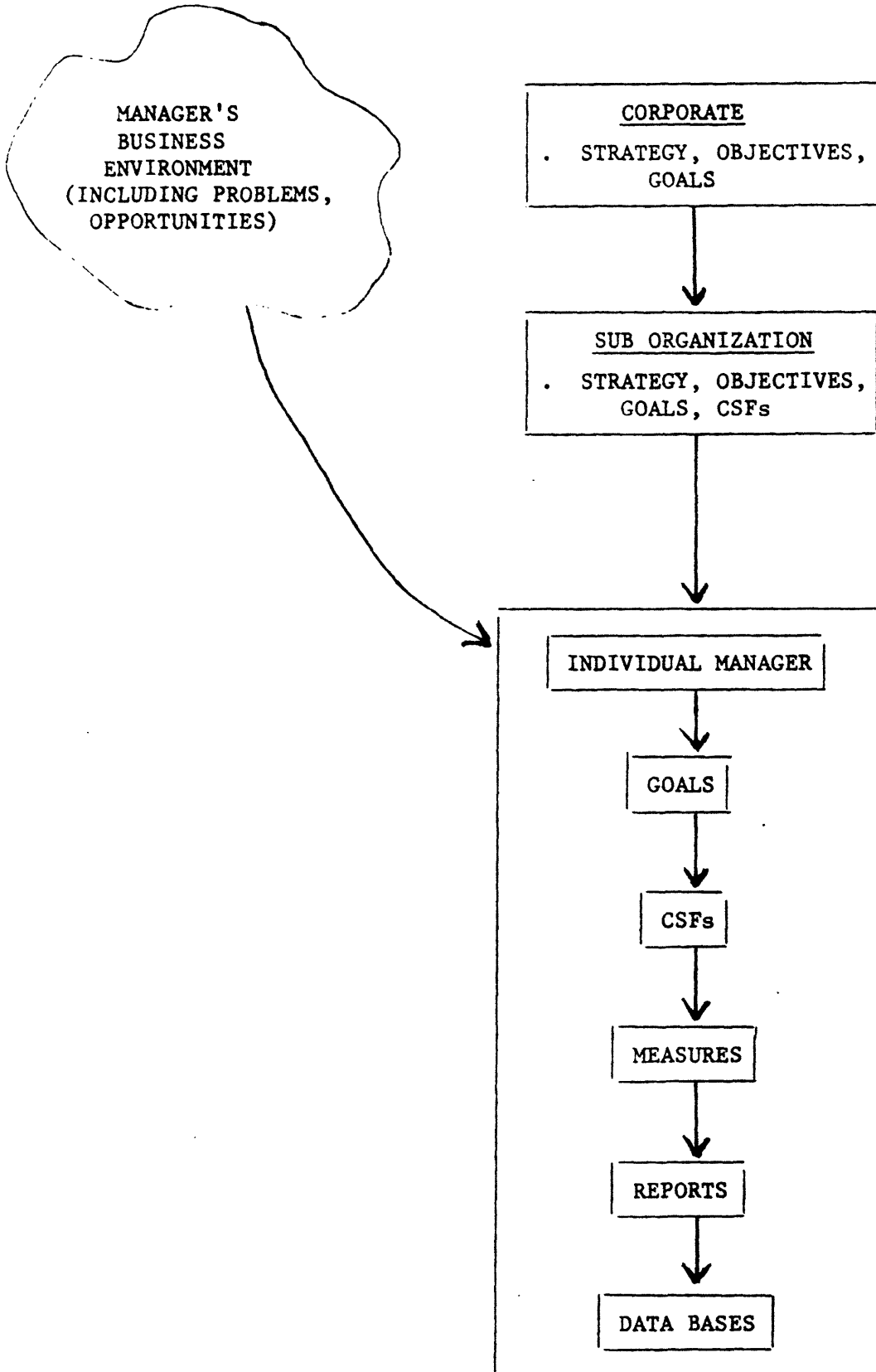


FIGURE 9

THE CSF PROCESS USED IN DETERMINING
INDIVIDUAL MANAGERIAL INFORMATION NEEDS



obtaining these goals. Measures which will allow the determination of the status of each CSF must then be determined and the reports which will display the latest value of each measure must be designed. Finally, the data bases from which the reports can be drawn are developed.

This is a rather straightforward, top-down process. The manager starts by thinking about his business environment, while paying requisite attention to the strategies, objectives and goals of upper levels of his organization. (The higher the manager is in the organization, the less he is bounded by the strategies, objectives and goals of others.) He then, by proceeding through the steps noted in Figure 9, moves from a business focus to an information systems focus in a series of clear steps which end up in the definition of data elements needed.

During the past two years, we have found this to be a useful conceptual path. It has helped many top managers to clearly visualize their information needs. However, it takes time, dollars, and energy to build the requisite data bases. By the time these are built, some of the appropriate measures and reports will have changed. Therefore, from a pragmatic viewpoint, the CSF concept is today being used for the most part as an aid in information systems planning in the manner described in Section c. below. It is on this that we will concentrate this discussion.

b. CSFs As An Aid in General Corporate Planning

Figures 4 and 5 in Section II.e. noted four different

levels of CSFs: industry, corporate, sub-organization, and individual. There is every reason to make use of these various levels of CSFs in the corporate planning process, and this is being done by several organizations. Since CSFs designate the areas in which good results must be obtained to ensure success at any level of the organization, it makes sense for an organization or individual to consciously determine the pertinent CSFs so that resources can be allocated in the planning process to ensure successful efforts in each CSF area.

There are multiple possible uses of CSFs in planning. For example, industry CSFs can be utilized in determining corporate strategy. Similarly, corporate and sub-organization CSFs should be significant inputs to the short-term planning process, and individual CSFs should be used by each manager in developing her action plans for a particular year. The following paragraphs briefly discuss the first and last of these uses.

Industry CSFs, as noted in Figure 5, are a logical and necessary input into the corporate strategic planning process. Corporate strategy should be heavily based upon an in-depth understanding of industry CSFs. In fact, there is a significant literature concerning the use of CSFs in the development of corporate strategy. Many consulting firms who specialize in strategic planning use either the CSF concept directly or a concept similar to it. They tend to preach that, for an organization to be successful, its strategy must

be developed to allow it to excel in those areas where high performance is critical -- or the organization must move into an industry niche in which, in effect, different CSFs exist.

At the individual manager's level, CSFs are also useful in planning. After the manager's goals have been determined, the determination of the relevant CSFs will lead to improved insight into the "best" resource allocation to key programs and activities to ensure that critical areas are emphasized. Figure 10 illustrates this individual planning sequence.

c. The Use of CSFs in Information Systems Planning

Currently the CSF method is being used primarily as a technique to aid in information systems planning. It is another tool like IBM's BSP or Gibson and Nolan's "Stages" which can be used as a planning method. In this section, we will discuss the CSF procedure as it is used for I/S planning purposes, the concept of "information data bases" which are the primary output of using the CSF process in this manner, and the reasons underlying the growing use of the CSF process in this manner.

(1) Procedure. Figure 11 diagrams the CSF procedure as it is used for I/S planning. The steps are as follows:

(a) In the chosen organization, most often a corporation or a major suborganization such as a division, the top 10-20 managers are interviewed using the CSF interview process discussed in the final section of this paper. Each manager's CSFs are determined. (Where time

allows, the measures used for each CSF are also determined, but this is not a necessary part of this routine.)

(b) Analysis of the results of the individual CSF interviews is performed. The individual manager's CSFs are charted, as shown in Figure 12, to determine the CSFs which have been identified by multiple managers and which, therefore, provide a good approximation of the organization's CSFs. Although each top manager's job is different -- and his CSFs are therefore different in some ways from his colleagues -- we have found that the intersection of all top manager's CSFs is the set of CSFs for that organization. These resulting CSFs are then checked with the organization's management.

(c) The organization's CSFs, as charted in step 2, in every case will indicate one or more key "information data bases" or "data processing systems" which should receive priority in the information systems development process. For example, the CSFs shown in Figure 12 indicate the need for a Human Resources information data base and a Corporate Strategy information data base. Priority should be given to the development of these data bases since they represent the means to satisfy the information needs of the key people in the organization -- top management.

(d) The information concerning the top management perspective on information systems needs developed in steps 1-3 above is then fed into the regular information systems planning process. Priorities are developed for information

FIGURE 12

INSURANCE COMPANY EXECUTIVES - CHARTS INDIVIDUAL CSFs

Corp. Executives CSFs	Human Resources	Strategy	Efficiency of Operation	Quality of Service	Pricing Strategy
<u> Holding Co. </u> Harris Connors Wolsky	(1 5 2)	(2 1 3)	(3 2 1)	4	5 4
<u> Property & Casualty </u> Pollack Contreras Jordan Holloway	(3 1 2 5)	1 4	5 1	(2 3 1 2)	2
<u> Life </u> Wensley Firenze Washington Rubenstein	3 3 4	(1 4 1 1)	2	1 3	(4 2 2 2)

Note: Numbers indicate priority (one being high). Circles indicate concurrence on CSFs within an executive group.

systems development.

(2) Information data bases -- the primary output:

As step 3 in the procedure above indicates, there are two major types of systems needs which are developed through this CSF procedure. The first is the need for particular data processing systems -- such as an on-line order entry system. This type of system needs no further explanation. In fact, an indicated need for these operational data processing systems is not often a direct output of a CSF process, since top management is not usually interested in the information contained solely in a single operational transaction-processing system.

Most often the key "systems" needs indicated by the CSF procedure are the development of one or more "information data bases." Top managers most often need information spanning various areas of the business. In general, the required information cannot be supplied by a single operational system's data base. Rather an "information data base" must be built.

Many examples of information data bases are given in the "Executive Information Support Systems" paper (3). For a full discussion of information data bases and relevant examples, the reader is referred to that paper.

Briefly, however, information data bases are quite unlike the traditional transaction processing data bases such as those developed for accounts receivable, manufacturing control, etc. Those more traditional operational data bases

store files of data which are used to process the paperwork which is the mainstay of the day-to-day life of an organization. These data bases must be up-to-date, accurate and complete. They must have well-designed sequences of data storage, optimized as far as possible to facilitate efficient processing of the thousands of daily transactions which occur in major organizations.

Information support data bases, on the other hand, are very different in purpose and the type of data they use. (See Figure 13.) They have no role in day-to-day operational paperwork. They are built primarily as data repositories to make information available for recall and analysis. They are fed in part, but only in part, by data from the operational data bases. Moreover, much significant "soft" data from customer surveys, market sampling, and internal planning processes are often also included in the information support data bases. So is "externally purchased" data from any of the approximately three thousand machine processable data bases which can be bought from information vendors today.

In technical structure, information support data bases are also different from the conventional data bases used primarily for transaction processing. Most information support data bases are designed with very inefficient, yet simple and easily understood file structures. Primarily they exist as a "set of tables." This makes them inefficient with regard to computing machine usage but easy for a user to understand, simple to access, and very responsive to change

and evolution.

(3) Reasons for the use of the CSF method as an aid to Information Systems Planning. The use of the CSF method for information systems planning is occurring because of several factors concerning both the data processing environment of the 1980s and the CSF method itself. These are:

- In 1980, a growing number of information systems executives are well aware of their operational paperwork-processing systems needs. They have been creating and working with these systems for the past 20-25 years. What they understand far less well, and therefore need to place emphasis on in the planning process, are the information needs of top management and the information data bases which must be built to support these needs. The CSF method provides a technique to do this.

- The CSF method to aid information systems planning is a "rifle-shot" technique aimed at understanding top management's information needs. It attempts to do only this. Therefore, it takes only 1-3 hours of each manager's time. It can be completed in approximately a person-month of effort. It is, therefore, inexpensive as a planning tool.

- In addition to its yield for information systems planning, the CSF method provides an additional, perhaps equally important, benefit for the interviewer. This benefit is a relatively deep understanding of the way in which each senior manager interviewed views the world. In effect, the interviewed managers spend the interview time discussing

Figure 13

A COMPARISON OF TRADITIONAL AND
INFORMATION SUPPORT DATA BASES

	<u>Traditional Transaction</u> <u>Data Base</u>	<u>Information Support</u> <u>Data Base</u>
Purpose and use	<ul style="list-style-type: none">● support transaction processing systems	<ul style="list-style-type: none">● data repository
Data attributes	<ul style="list-style-type: none">● up-to-date● accurate● consistent● complete	<ul style="list-style-type: none">● timeliness not critical● "hard" and "soft" data● consistent● completeness not always possible
Storage method	<ul style="list-style-type: none">● optimized for efficiency of computer resources	<ul style="list-style-type: none">● tables of data designed for easy access & change
Ability to change the data base	<ul style="list-style-type: none">● difficult● only after much consideration of "downstream" effects	<ul style="list-style-type: none">● easy to accomplish● data base designed for change and evolution

FIGURE 10

SEQUENCE OF CSFs
USED IN INDIVIDUAL PLANNING

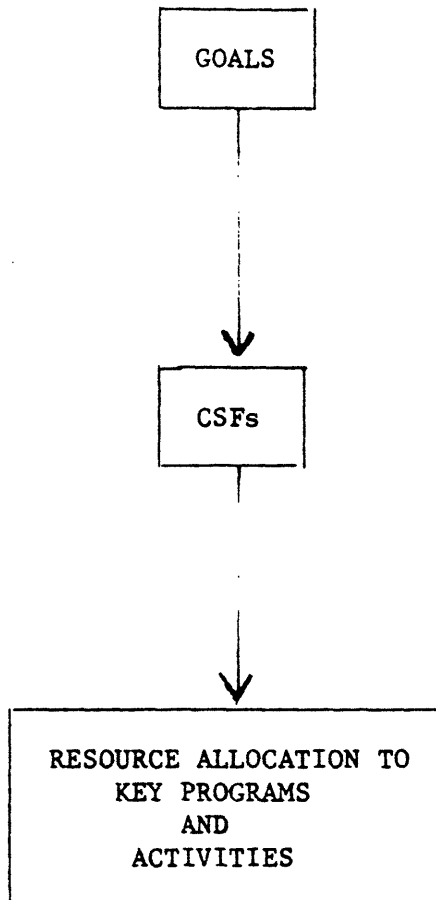
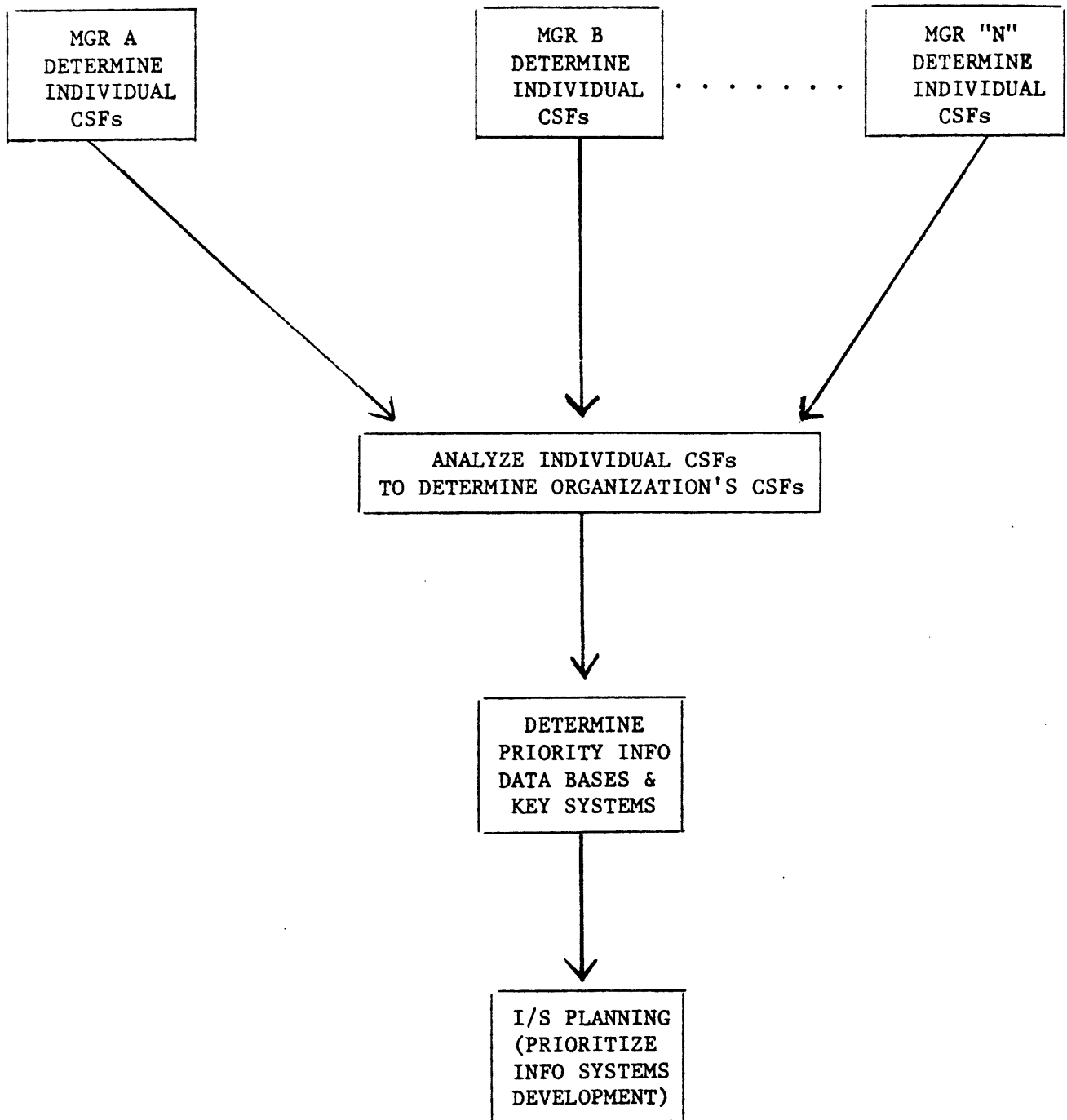


FIGURE 11

CSF PROCEDURE FOR I/S PLANNING



their jobs as they see them, and the areas which they believe are most critical to them. Interviewers who have used the CSF process (in many cases the top person in information systems) have almost unanimously reported that this "insight into top management and its view of the business" has been, by itself, of significant value to the I/S department.

- Perhaps equally important, the CSF procedure provides top management with a vehicle for thinking about their information needs. In far too many organizations, top management has given little time to pondering their own information needs. Rather, they have been concerned with the traditional areas of marketing, manufacturing, finance, etc. In many organizations, top management has not yet made the shift to the realization that, with today's technology, it is not only feasible, but desirable (and some would say even necessary) for them to spend time thinking through their information requirements. The CSF method is a business-based, logical, and time-sparing entree into this new endeavor for line management.

- Finally, the CSF method, used as an aid for information systems planning, focuses on the definition of those information data bases which are necessary to support the information needs of all (or at least a significant number) of top managers. It is expensive to build an information data base for only a single executive (even if he is the President). However, where it can be shown, as in this use of the method, that an information data base will

serve the information needs of many of the organization's top executives, the justification of the development of such a system is more straightforward.

III. INTERVIEW PROCEDURE AND TECHNIQUES

This section is written for the person who is about to undertake his first CSF interview. Here, we attempt to communicate all those things which appear to be important as we look back on three years of CSF interviewing. In addition, this section reflects the knowledge gained from our discussions with others who have used the CSF method. Three major areas of interview procedure and technique follow. They are:

- Objectives of the interview
- Pre-interview preparation
- Interview procedure

A. Objectives of the Interview

A CSF interviewer has a unique opportunity. Given the managerial time and attention which has been made available, she should capitalize on it fully. Just coming out with the manager's CSFs is not enough. Rather, the interviewer should seek to accomplish all of the following four objectives:

1. To understand the interviewee's organization and the mission and role (the "world view") of the interviewee within the context of his organization as the interviewee perceives them.
2. To understand the goals and objectives of the interviewee.
3. To elicit CSFs and measures from the interviewee.
4. To assist the manager in better comprehending her own information needs. This may be the first time

that the manager has confronted these information needs in a structured way. The CSF interview often presents the initial occasion to interact with the manager on the types of information support that might be useful to her. In the haste to "collect data" on CSFs and information needs, the reverse, educational opportunity should not be overlooked.

B. Pre-interview Preparation

As noted earlier in this guide, pre-interview preparation is important. It provides one not only with knowledge, but also with the confidence that knowledge brings. The following steps represent the major pre-interview actions we have found to be most useful to people desiring to conduct CSF interviews:

1. Read and be thoroughly familiar with the articles, "Chief Executives Define Their Own Data Needs" (1), "Executive Information Support Systems" (3), and earlier sections of this guide. All provide, in addition to the conceptual aspects and procedures of the CSF method, some useful examples which can be used when needed to explain the rationale for CSFs to an interviewee.
2. Be thoroughly familiar with the industry. Understand the industry competitive forces, trends, and environment. Know the current problems, issues and news makers. This is important during the interview both in eliciting CSFs and in fully

understanding the importance of each CSF.

3. Study the company or companies to be interviewed. Use publicly available sources such as annual reports, internally-available company histories, and organization charts. External sources such as articles in the Wall Street Journal, Business Week, Forbes, and Fortune, are often highly useful and are available in greater volume than is commonly thought. Most important, one should spend time with the people in the company who are sponsoring the study. Their insights into the company, its strategy, environment, current problems and opportunities are invaluable. Internal company political issues should be probed, where possible, with these company contacts since these are important. All of this background is highly useful for conducting each interview smoothly and intelligently.
4. Initiate the transmission of a letter from the top management of the company to all interviewees prior to the interview. The letter should explain the purpose of the undertaking and explicitly show top management support for it. This letter should also include background material to prepare the interviewee for the session. It is desirable to include a copy of "Chief Executives Define Their Own Data Needs" with a request that it be read

prior to the interview. In addition, a brief outline of the interview process should be enclosed.

5. Plan to start interviews at the lowest level of management to be interviewed and work up. This provides the ability to review, in preparation for interviews with higher-level managers, the knowledge gained from the CSF interviews of managers at lower levels. In this way the interviewer can become increasingly more comfortable in discussing the company and industry issues before being confronted with the top two or three managers in the organization.
6. Plan to have, and enlist, a key manager from the company to accompany the interviewer on the interviews. There are pros and cons to this method. On the plus side, one has the benefit of an insider's insight in discussing the interview afterwards. There is someone available who can help clarify company-related obscure points during the interview. In addition, the person from the company has a stronger stake in implementation if he has been part of the process. However, on the minus side, the interviewee may not be as honest and frank during the interview because an insider is present.

There is no available objective evidence as to

whether the pros outweigh the con on this issue. Suffice it to say, that for all three positive reasons noted above, we generally want to have a key manager with us during the interviews.

7. Prior to the interview, assume the role of the interviewee and list, from all acquired knowledge, her probable objectives, goals, CSFs and measures. This can be an enormous aid during the interview in eliciting a complete set of CSFs and measures quickly and easily. This technique is an aid in getting the interviewer's thinking on the right track. The danger in doing this is that the interviewer may try to force his own CSFs on the interviewee. Care must be taken to guard against this.
8. Brush up on interviewing skills. There are approaches and techniques for conducting interviews in an interpersonal setting which, used well, can enhance the success of a CSF interview.

C. Interview Procedure

With the necessary preparation out of the way, the day of the first interview arrives. This section provides a step-by-step outline of the several parts of a CSF interview. These are (1) Opening the Interview, (2) Interviewee's Description of Mission and Role, (3) Discussion of Interviewee's Goals, (4) Developing CSFs, (5) Prioritizing CSFs, and (6) Determining Measures.

1. Open the interview. Give a brief introductory statement of how the CSF method is used to determine managerial information needs. Although the interviewee has had preparatory material, a few remarks to refresh his memory are never out of place. The response to these remarks will also help to determine his degree of understanding of the CSF concept. If it becomes apparent that the interviewee has not read the material provided, it is necessary for the interviewer to provide a more in-depth introduction to the CSF concept and the purpose of the interview.

a. Example of brief introductory statement. "As you know from the material you have received, we are using a new method for assisting managers in looking at the way they manage and, as a second step, for determining their information needs. This technique focuses on identifying those factors in a manager's environment which must go right in order for the manager to achieve her goals and objectives. These are called critical success factors or CSFs."

b. Example of lengthy introductory statement. "In the past, analysts have attempted, with only occasional success, to define the information needs of managers. For the most part this

failure has been due to the lack of a common vocabulary, a poor understanding of the business on the part of the analyst, and an inability of the manager to relate his information needs to the demands of his day-to-day operations. As a result, many so called "management information systems" were designed and built which in no way served management. We are currently using an interview method which appears to have overcome many of the shortcomings of previous methods. This new technique focuses on identifying those factors in a manager's environment which are the most important and for which good results must be obtained in order for the manager to achieve his goals and objectives. These are called "critical success factors" or "CSFs". In the past, information systems have been designed primarily to report on levels of achievement toward managerial goals. Using the CSF method we can design information systems which report on the results in areas underlying eventual success or failure in the achieving of goals. CSFs answer the basic question of 'Where should you place managerial attention?'. Once that question has been answered an information system can be designed to report on

the current status of areas which require most attention.

"In this interview we are going to start by describing your mission and role, move on to your objectives and goals, and then discuss the critical success factors that support these."

If the interviewee needs examples to clarify her understanding of the concept, use examples from the Harvard Business Review article or this guide. Choose examples which are appropriate to the interviewee, the company and the industry.

2. Ask the interviewee to describe his mission and role. This initial question serves two major purposes. First, it is an easy way to get the interviewee into the process and to start him talking. He is asked to discuss that which he knows best, his company and his job. Second, however, as the manager discusses his job, he almost always provides clues as to how he "views the world." Is he strategically oriented? Does he view his job as one which is set up to induce change into the organization, or is he a "caretaker" put in the job to carry out the routines which have been developed by past managers? Many of the things which are important to him come to light during this exposition

including, often, a few critical success factors. The interviewer should take careful notes during this section of the interview. It should provide a cross-check on what is said later since the manager's CSFs should consistently relate to his role as it is perceived.

3. Discuss the manager's goals. Some definitions are often necessary in this part of the interview. Managers will often ask "Do you mean goals or objectives? Short-term or long-term?". We zero in on goals (see definition pages 6-7) since objectives, as defined in this guide, are not very meaningful with regard to CSFs. As to the time horizon for goals, the manager should be asked to respond with the time horizon (short or long) that is most meaningful for him. Most managers pick a one-year horizon; some provide both long and short term goals. The choice of the time-span and nature of the goals selected is meaningful in itself since it provides further insight into the way the manager views his job.

A fair number of managers, given this question, will reach into a drawer and pull out the set of goals, often determined by an MBO process, on which they are being measured during the current year. Seeing this list, our response -- in addition to writing them down -- most often is to

ask, "All right, this is the set of goals on which you are to be measured, but managers often have other less formally stated goals. Some of these informal goals are often as important, if not more important, than the agreed-upon goals. Do you have any goals which fit this category?" Here managers sometimes expose significant, unspoken goals. For example, a manager in one company had, as a primary goal, the elevation of his sub-organization higher in the company to give it (and him) more power. Since a good part of some managers' critical success factors relate to these unstated -- yet very important -- informal goals, it is highly useful where possible to bring these goals to the surface.

4. Develop the manager's CSFs. The process of determining the manager's CSFs can be quite simple or rather difficult. If the manager has done the prerequisite reading and has given some thought to his CSFs he may even have a written list to present to the interviewer together with an appropriate explanation of each CSF. Alternatively, a manager who has not thought much about his job and its responsibilities may prove to be a poor subject. Fortunately, the latter case is not often found at the top of reasonably-sized organizations. (We note ways of working with "difficult" interviewees

later in this section.)

(a) Some questions that are helpful in eliciting CSFs. No matter how smoothly the interview goes, it is useful to triangulate in on the manager's CSFs through a series of questions. The first, and obvious, question is:

"Will you please tell me, in whatever order they come to mind, those things that you see as critical success factors in your job at this time?"

As the manager proceeds, the interviewer should not hesitate to ask for clarification of a CSF where it is unclear. At the end of the list, however, we find it useful to get the manager to think about her CSFs from two other perspectives which can elicit additional CSFs or, at the very least, assist in prioritizing CSFs. The two additional questions are:

"Let me ask the same question concerning critical success factors in another way. In what one, two or three areas would failure to perform well hurt you the most? In short, where would you most hate to see something go wrong?"

and

"Assume you are placed in a dark room with no access to the outside world, except for food and water, today. What would you most want to know about the business when you came out three months later?"

As simple as these questions seem, they have turned out to be highly effective in assisting managers to zero in on the few most critical areas of their responsibility. One must, of course, use

a manager with at least a slight sense of humor to react well to it. In general, each CSF interviewer tends to develop his own set of "CSF-checking" questions. These are the ones we use, however, and they can serve as a starting point.

(b) Things to do while the manager is telling you his CSFs. The skillful CSF interviewer is always in "multi-processing" mode during the interview. Among the things that are helpful to do while the manager is talking and you are writing down her CSFs (or even in a few "dead" moments toward the end of the interview if necessary) are the following:

(1) Using the CSF classifications summarized in Figure 3, mentally check the list of CSFs to ensure the interviewee has not focused on only one type of CSF. For example, some managers tend to think only of their internal issues and overlook the roles they play externally. The interviewer should be aided in uncovering this oversight by the initial mission and role description given by the interviewee. In addition the background research which was performed should also help the interviewer to ask about relevant areas that the interviewee has not mentioned, particularly in the area of external and environmental CSFs. For example, especially at the presidential level,

consider CSFs that might arise out of issues involving environmental factors such as competition, new technology, and regulatory issues.

(2) "Aggregate" CSFs to ensure that one CSF is not being discussed in multiple ways. Some interviewees "get stuck" discussing one area that is of particular concern at the moment. They will often echo the same CSFs in different ways and think they are talking about new CSFs. The interviewer should be aware of this possibility and be ready to suggest that several CSFs are really one. Then using techniques described earlier, try to draw out others. Of course, it is possible for a manager to have only one or two CSFs, therefore the interviewer should not try to persuade him into more CSFs if it is not appropriate.

(3) Check to ensure that all CSFs are being elicited, not only those that can be measured with hard data. Even though the CSF method avoids talking about computer-based information systems, some interviewees limit their thinking to what they believe to be appropriate CSFs for "computerization." Be sure to stress that the method is designed to elicit all information needs -- soft as well as hard. Use examples of soft CSFs like "relationship with the boss," "supportive spouse and family" to illustrate this point.

In sum, doing the interviews, the interviewer should check to be sure his involvement is "helpful," not directive. He should be careful when asking questions about areas not covered directly by the manager to not indicate a judgement on his part. His job is not to convince the interviewee of his CSFs but to draw them out. Most managers will not be unduly influenced by the interviewer but one should be sensitive to the possibility.

On the other hand, as suggested by points 1-3 above, the interviewer should be sure that he has "stretched" the manager as far as possible in his thinking during the interview. The majority of interviewees have no difficulty in responding with their CSFs. Some, however, do not understand the concept and need a great deal of prompting. (Where possible, the interviewer should be ready with examples and anecdotes from past interviews to assist in such a situation.) This is a situation in which one must be extremely sensitive to the problem of "leading the witness." The interviewer must walk the narrow line of eliciting information without creating the answers.

5. Prioritize CSFs. Some further insight into the manager is often gained by having the interviewee put CSFs in priority order. Absolute priorities

are not essential: general indications of what the interviewee views as most important will suffice. In fact, many managers will not prioritize CSFs, and it is not necessary to do so. They are, after all, a small high-priority set of things -- all of which are critical. Quite often no one is more critical than the others.

6. Determine Measures. Where time permits, it is useful to determine measures for CSFs and to identify the sources of these measures. After the CSFs have been determined and prioritized, the interviews should proceed to discuss possible ways of measuring each. This is an area for great creativity. The interviewee may come up with measurements which are meaningful to her but which appear unusual. The interviewee is indicating the ways in which she measures the status of each factor now. The interviewer may wish to make suggestions based on her initial preparation or subsequently acquired knowledge. There is no danger of "leading" here. The interviewer may suggest a way of measuring that the interviewee did not think of but likes and will use.

In general, this final step, determining measures, does not need to be carried out during the initial CSF interview. It is certainly useful if one has extra time at the end of the initial

interview. However, it can wait until after the entire initial CSF exercise described in this primer has been completed. Then, when the desired information data bases have been decided upon, a more probing second-stage interview can be held. Here measures should be defined in great detail to zero in on the contents of the required information data bases.

IV. ANALYSIS OF DATA

There are two major steps in the analysis process. They are described below:

A. Reviewing CSFs. Each interviewee's CSFs should be reviewed against the classification and dimensions noted in Section III to check whether the interviewee has covered all the major areas of his job (e.g. if the interviewee is a manufacturing manager, are "role" CSFs such as quality, costs, and inventory control noted?). In addition, one can check interviewees "against" each other to see if each fits a "pattern" of CSFs which appear due to a common managerial perception of problems, opportunities, industry structure, current competitive conditions, and so forth. The interviewer has the background of his research, the interview and his own experience to assist him in this review. Primarily, however, the interviewer will have a good "feel" for the company after the start of the interviewing. If there are major gaps, this should be brought up in a subsequent review meeting with the particular interviewee.

It is highly desirable to prepare a written version of the CSFs to be reviewed and approved by the interviewee. In addition to ensuring that the facts are correct, this step may elicit additional information.

B. Aggregating CSFs From the Individual Manager Interviews. As noted earlier, interviewing several executives in one company is the initial step towards determining the CSFs for the company as a whole. By then

aggregating the CSFs from the individual interviews, the interviewer can discover exactly which information data bases are most necessary to support the managers.

For example, in several instances, we have had interviewees list CSFs that deal with market analysis. In most of these cases, some of the information needed to track progress with regard to these CSFs was internally generated, e.g., sales "hit/miss" reports. Other information was external in origin; for example, competitors actions, customers response patterns, and market share data. In sum, however, the CSFs pointed directly to the need for a marketing information data base.

In another situation, the president named a CSF of improving employee morale. Farther down the management chain, executives were concerned about professional development and training for their employees. One interviewee mentioned that employee turnover in his area was higher than desirable. Many other CSFs in this company hit the "personnel" theme. The need for a human resources data base was easily identified.

A CSF chart, such as the one shown on Figure 12, can be very useful in this aggregating process. One can easily circle the CSFs which point to particular information data bases.

At this point, the CSF data should be in convenient form to feed into the company's information systems planning process. The information data bases required for top

management should be given consideration for priority development. Not too surprisingly, top management is often willing to allocate additional resources for the development of these systems.

Once a decision is made to go ahead with a particular information data base, a second phase of interviews begins. Here the emphasis switches from identifying the CSFs, to determining each manager's measures for his CSF's and the data needed for each measure. In this way, the necessary data structure for each information data base can be established.

References

1. John F. Rockart, "Chief Executives Define Their Own Data Needs," Harvard Business Review March-April 1979, p. 81.
2. D. Ronald Daniel, "Management Information Crisis," Harvard Business Review September-October 1961, p. 111.
3. John F. Rockart and Michael E. Treacy, "Executive Information Support Systems," CISR Working Paper No. 65, November 1980 (Revised: April 1981)