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CRITICAL SUCCESS FACTORS--  
THE SINE QUA NON OF MANAGEMENT CONTROL SYSTEMS

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A primary cause of weak, ineffective management control systems is the failure to report to managers on the factors truly critical to success. Accounting executives must bear a substantial share of the blame--and blame should be attributed--for this state of affairs. Only if designed to do so can management control systems do that which the name implies:

Management control is the process by which managers assure that resources are obtained and used effectively and efficiently in the accomplishment of the organization's goals.<sup>1</sup>

Accountants have abdicated their responsibility of the design of the content of the management control system to the gaggle of computer specialists, always willing to accept the thus-professed support of the controller in justifying still more systems analysts to the EDP organization.

After reviewing how and why this situation has come to exist, a specific technique and an action plan by which to use the technique will be suggested. Controllers can, with this technique, regain the initiative and reassert their design responsibilities, as shown in the brief case study reference.

### Management Control Systems

For the purposes of this discussion, the Management Control System (MCS) is defined to be a reporting system which allows managers, through interactions with other managers, to assure that the necessary resources for the organization's operation are identified and collected. In addition, through the MCS, managers assure that those resources are used efficiently and effectively in the accomplishment of the organization's objectives. This definition by Anthony and Dearden is the one widely accepted in management control system circles. In the context of system design it is necessary that each of the

key words and phrases in that definition be understood.

First and foremost the management control system is one designed to give information to managers so they can appropriately interact with other managers. This definition, therefore, excludes information needed by first-line supervisors in their day-to-day supervision of operating personnel and in the supervision of the consumption of materials and supplies. Managers are expected to take action based on information reported in the management control system. In order for this to reasonably be accomplished, the control reporting system must provide information in time for appropriate action to be taken before the event has become an item of history. The control reporting system must appropriately identify those areas where action is required so that managers, themselves, are not inefficient in the utilization of their time. It is appropriate that managers have identified for them specific items on which action is needed and, further, that information on items on which no action is needed be omitted from the report so that the report is not overloaded with extraneous information. In relating the information system to the resources required for the firm, the entire spectrum of necessary resources must be included. This includes not only the obvious items of capital equipment and inventory but human resources as well. The management system must define and report to the appropriate managers the information needed by them to manage the process of the collection and utilization of all resources in the firm. In saying that managers are expected to manage the efficient and effective utilization of resources, the definition encompasses the dual compatible aspects of not wasting money with the simultaneously achievement of set goals. Efficiency has to do with doing that which is being done at the lowest feasible cost. Effectiveness has to do with achieving the desired goals, doing, in fact,

that which one is supposed to be doing in terms of product and service. It is, of course, possible for one to be quite effective but at a very high cost that is, very inefficient; it is also possible to be very efficient, performing at very low cost, but doing something other than what is intended--the process, being very ineffective. Finally, the aspect of goals and objectives is incorporated in the definition. No manager can operate in a vacuum; every manager has some specific goals and objectives to which he pays attention in the ordinary course of business. It is often the case that managers are not provided corporate long-term or short-term objectives. The absence, however, of these corporate objectives does not mean that managers work without objectives. Indeed, as a practical matter it is impossible to do so. There are often to be found objectives of cost improvement, sales volume increases, price increases, and the like.

#### Systems Design: Historical Perspective

In the design of an information system for a firm, the basic approaches to identifying the information needs of management have revolved around the formidable concepts of the feedback mechanism and of exception reporting. Application of these appropriate concepts to the actual system design activity, however, has often proven to be extremely difficult. The problem, simply stated, is that of determining what it is that is to be reported through the feedback process, and how to determine which exceptions are significant and which are not significant. Conventional techniques which have been used in attempts at solving this problem have been identified as (1) the unstructured interview approach and (2) the data processing approach.

1. The Unstructured Interview. Because the management information system is being designed for management, it is to the neophyte a reasonable expectation that managers ought to be able to define the information needed by such managers for their use in the course of their day-to-day activities. Acting on this assumption, accountants have interviewed executives and managers, leading off with the general question, "What is it that you would like to have reported so that you can better manage the firm?" It is a rare and unusual executive who can respond meaningfully to this open-ended question. Executives typically have not structured for themselves their information needs. It usually follows that, when faced with this interview question, managers are unable to give a meaningful response. The response often does include such comments as the following:

The information that I am presently getting is what I really need. Of course sometimes it is not as timely as I would like and sometimes the information proves to be less accurate than I would prefer; or,

I don't really know what I need. I suppose that on a day-to-day basis as problems come up, I search out the people who have the information and I get what I need to make the decisions that need to be made; or,

There's no way I can answer that question. The problems that occur from day-to-day are different kinds of problems. When the situation arises, I have to face the circumstances and solve the problem as best I can; or,

I really don't pay attention to the current operating reports. Everything included is historical from days, weeks, and even months, in the past. What I need is information about what is going to happen tomorrow, not last month.

The accountant faced with such responses to his interview questions retreats, assigns the problem to an EDP team and abdicates to the analyst the design of the systems which generate the routine, commonplace, inadequate control information. The resulting management control reporting

systems are accounting systems based, simply utilizing accounting transactions captured as they occur. The textbook responsibility accounting systems are based on reporting historical facts, budgets, variances from budget, and variances from cost standards, profitability, return on investment, and the like.

All reports from such a system are indeed relevant, but only to a degree, to the operations of an organization. The question which remains unanswered, however, is whether the analyst has really identified the items which should be routinely feedback, particularly with respect to the important aspect of timeliness. The further question remains unaddressed as to the significant versus the relevant but insignificant in terms of control action.

2. Data Processing Approach. In the data processing approach the accountant assembles a massive data collection from all available sources and begins an analysis and distillation of the collection with the objective of filtering out of the huge mass of data a specific set of control items to be subsequently utilized.

He typically sets up a data collection schedule which requires going through the entire organization, collecting source documents at each and every location at which source documents are generated. The accountant traces those documents through the spectrum of the manual and automated data processing system. At each step of the process, records are made regarding how the data is received, recorded, and transcribed; what data is merged with, added to, compared with the data received; and the disposition and distribution of the resulting information. This is a massive project requiring collection of thousands of documents relating to orders,

production, shipments, inventories--all aspects of the operation of the firm. Typically, copies of each document in its completed form are kept, flow charts are made of the entire process leading ultimately to the reporting of information to managers. The assumption is that somewhere in the entire mass of data so collected, anything that might be needed by a manager is captured and is, therefore, available for reporting. While there is some logic to this approach for a firm which is well-managed, the system often leads to sub-optimization simply because the mass of data to be analyzed is overwhelming.

#### Critical Success Factor System

As an alternative to the historical techniques, an important variation and combination of them has evolved. Based on the "key variables" idea of General Electric, as described by Anthony and Dearden<sup>2</sup> and by Jerome,<sup>3</sup> a Critical Success Factor (CSF) technique was developed. The technique includes modifications based on Rockart's Report in the Harvard Business Review<sup>4</sup> and a similar report by Roderick and Tufts<sup>5</sup> of MIT.

The critical success factor concept is based on the identification by each individual manager and executive in the firm of those few specific elements which must be well managed if the organization is to succeed. By definition then, the organization cannot succeed if the item is not well managed. Of course, management of these critical success factors does not necessarily guarantee the success of a firm; there are important external factors which are beyond the control of the firm. However, the theory is that the identification of the critical success factors for management control reporting is a prerequisite to success of the firm.

A carefully structured series of interviews with key executives is the technique for effective application of the critical success factor concept. The technique will be further described using the pilot study as the vehicle for detailed explanation. Clearly, the active participation of key executives is the vital ingredient prerequisite to the successful design of a management control system for those executives. The unstructured interview technique was known to be inadequate. Therefore, a structured interview would have to be the vehicle. But the structure could not be one which suggested responses or even which tended to lead the interviewee toward a narrow response. Step No. 1, then, was the development and pre-test of an interview technique which would be simultaneously structured and free from interviewer bias.

Step No. 2 was to interview each key executive in the organization, using the specific sequence of questions to be asked and answered as evolved in the first step, building ultimately to the important measurements to be included in the management control system. This step required answers to three questions.

Question No. 1 required that each executive prepare a concise statement of his objectives in the performance of his job in the firm. The question was phrased as follows:

As step number one, a brief statement of the long-range and short-range objectives of the subject job/function is required. These statements should be phrased as you, the incumbent manager, understand them at this point in time. This step is the basis on which all that follows will be predicated.

Within the context of the statement of objectives by the incumbent for his job, Question No. 2 required that he identify these factors in the performance of the job which are critical to the accomplishment of the

objectives; in other words, the critical success factors (CSF). This question was phrased as follows:

Within each job/function there can be identified a few very basic activities or tasks which are absolutely critical to success; the number of such critical factors generally varies from four to eight depending on the unique circumstances of each job. The first task of our survey, then, requires a concise and precise statement of each of these critical success factors.

Question No. 3 required each executive to identify those measurements which would, in his judgment, be most useful in evaluating whether success on each CSF was being achieved. Whether the measurement was currently being reported--indeed, whether it could be reported--was not to be considered (in effect, a classic "brainstorming" ground rule.)

Having identified the critical success factors in your present assignment, we now must decide on the best/most valid measure(s) of each factor. The measure must be relevant, highly correlated with the factor if not a direct measure and timely to management control action. In answering this question, ignore the present set of reports you receive; it will not reflect adversely on you if you identify an important measure which is currently unavailable to you. Further, do include measures from external as well as internal sources and predictive measures as well as historical data. Also, do include measures related to the accounting system as well as measures not captured by the chart of accounts.

Exhibit I is the form on which the responses were to be explicitly listed by the analyst as identified by the executive. In this phase of the process, the form was given to each executive in advance but not with the expectation that the manager would simply fill out the form. In fact, just the opposite was true; the expectation was that the analyst would fill out the form during the interview.

The managers were given copies of the complete survey instrument ahead of time so that they would know the framework for the interview which would

follow. This process of getting the critical success factors down on paper was, as might be expected, one which varied significantly from executive to executive. Some individuals were able specifically and directly to address the question of the CSF's in their job. Typically these were executives with analytical jobs such as market research, accounting, long-range planning, and the like. On the other hand, some executives were, without assistance, unable to specifically focus on critical success factors in the interview; the interviewer carefully used structured interview questions in which open-ended questions were asked of the manager with copious notes taken by the analyst. In the course of the conversation when something emerged which appeared to the analyst to be a critical success factor, the analyst would ask the executive penetrating questions in and around that critical aspect until the factor was clarified.

The first round interviews seldom progressed beyond the point of copious notes. The analyst carefully evaluated the interview notes and wrote in a formal way on the survey instrument the statement of objectives, statements of critical success factors, and measurements relevant to those CSF's.

Specific measures of surrogates for and items closely related to the critical success factor were listed. In some cases the critical success factor was in itself a measurable item; however, as is often the case, the critical success factor is an intangible for which surrogates must be measured and reported. This writeup was returned to each manager initially interviewed as a draft for his review, consideration and reaction. By working through this process, sometimes with as many as two or three follow-up interviews and redrafts with each executive, a set of critical success factors and measurements for each key executive in the firm evolved.

These critical success factors and the corresponding measurements became the basis for the redesign of the management control and reporting system for the firm. A partial matrix of the critical success factors (disguised for confidentiality) is shown in Exhibit II; because of their confidential nature, the corresponding sets of measurements cannot be revealed.

### Management Reactions

Because of the innovative approach used in the study, several management reactions are of interest. First, there was a concern that senior, old-timer executives would reject the study as vague, theoretical and in some way offensive. The pilot study was designed to include this executive group (and others) so that any such problems could be immediately addressed. The concern proved unfounded; the senior executives had no difficulty with the survey. Second, the number of critical success factors per executive was viewed as a potential major problem; if each executive viewed an assortment of 20-30 items as critical, no management control system could result from such a mass of items. In fact, the number of CSF's per executive ranged from four to eight, a manageable number (consistent with Rockart's findings of four to seven<sup>3</sup>). Thirdly, the CSF matrix which emerged was not, as some feared, filled with vague, platitudinous phrases but--as shown in Exhibit II--included actionable, objective oriented factors. Perhaps most satisfying of all was that the evolved matrix appears rational and logical, as some had doubted.

## FOOTNOTES

<sup>1</sup>Anthony, Robert N. and John Dearden, Management Control Systems Text and Cases, Robert D. Irwin, Inc., Homewood, Illinois (1976), p. 8.

<sup>2</sup>Ibid., pp. 138-143.

<sup>3</sup>Jerome, William T., Executive Control--The Catalyst (New York: John Wiley & Sons, Inc., 1961), pp. 217-237.

<sup>4</sup>Rockart, John F., "Chief Executives Define Their Own Data Needs," Harvard Business Review, March-April 1979, pp. 81-93.

<sup>5</sup>Roderick, Jane B. and Linda K. Tufts, "Critical Success Factors in a Decentralized Company," (M.I.T.: Industrial Liaison Program (unpublished, April 1979).

EXHIBIT I  
PHASE ONE  
SURVEY QUESTIONNAIRE  
MANAGEMENT CONTROL SYSTEMS

A. Manager: \_\_\_\_\_ Date: \_\_\_\_\_

Functional Responsibility: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

- B. As step number one, a brief statement of the long-range and short-range objectives of the subject job/function is required. These statements should be phrased as you, the incumbent manager, understand them at this point in time. This step is the basis on which all that follows will be predicated.

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EXHIBIT II  
COST-ORIENTED CRITICAL SUCCESS FACTORS

| <u>Critical Success Factor</u>  | <u>Production Manager</u> | <u>Product Manager</u> | <u>Controller</u> |
|---|---------------------------|------------------------|-------------------|
| Optimize purchase prices and terms  | x                         | x                      |                   |
| Define capital projects precisely and completely                                      | x                         |                        | x                 |
| Control design, schedule and cost of projects   | x                         |                        | x                 |
| Schedule production for increased production, optimal cost, inventory levels, service |                           | x                      |                   |
| Manage warehousing, transportation and demurrage costs                                |                           |                        | x                 |
| Develop profit plans  |                           |                        | x                 |
| Manage asset security   |                           |                        | x                 |
| Manage raw material consumption   | x                         |                        |                   |
| Manage direct labor hours   | x                         |                        |                   |
| Manage energy costs   | x                         |                        | x                 |