From Our Readers

An Opinion . . .

"COMMENTS ON THE CRITICAL SUCCESS FACTORS METHOD FOR OBTAINING MANAGE-MENT INFORMATION REQUIREMENTS IN ARTICLE BY JOHN F. ROCKART, "CHIEF EX-ECUTIVES DEFINE THEIR OWN DATA NEEDS," *HARVARD BUSINESS REVIEW,* MARCH-APRIL, 1979"

The Rockart article, explains a method of eliciting information requirements developed by the MIT group. The method, called the critical success factors method (CSF), is to elicit from executives their perception of critical success factors for the organization they manage.

There are come critical possibilities for failure with the critical success factors method defined by Rockart. As a method of obtaining management information requirements from executives, it is very interesting and has the virtue of being operational, since managers are able to articulate from four to eight critical success factors. The possibilities of failure with the method center on the ability of executives to respond with critical success factors that are correct, complete, and sufficient. When asked to give the critical success factors, executives may name some irrelevant or incorrect factors or respond incompletely. This may happen because of four underlying phenomena that were not dealt with in the article: human capacity for information processing, bounded rationality, human ability to evaluate probabilities and to identify causality, and biasing effect of availability of data.

The human capacity for holding chunks of information in short-term (processing) memory has been established by research to be in the range from five to nine chunks (frequently stated as 7 ± 2). Other researchers have set these limits as low as 5 ± 2. A "chunk" ory can be a factor of evaluation, a visual image, a data item, *etc.* The limits on human capacity for holding and manipulating chunks of information in short-term memory means that managers will naturally reduce the set of critical factors they process to a manageable number in the range from five to nine (or the four to eight range established by the Rockart research). There may be more than four to eight critical success factors, but if managers reduce the set they consider to a manageable four to eight, the CSF method will obtain only those factors that survive the human processing limitations. To focus on this limited number overlooks the fact that a computer-based management support system can be designed to extend the ability of the manager to deal with more chunks of information. Obtaining only the factors the manager currently possesses does not take advantage of the symbiosis possible with computer-based decision support systems.

The second phenomenon is bounded rationality. Humans have a limited capacity for rational thinking and must therefore construct simplified models of the real situation in order to deal with it. Behavior with respect to the simplified model may be rational, but it does not follow that the simplified model correctly reflects the actual situation. The model is also restricted or bounded by experience, training, prejudice, custom, and attitude. The CSF factors obtained by inquiry will be restricted by the bounded rationality of the executives; therefore, the factors may not be complete or may not accurately reflect the actual situation.

Another difficulty arises from the limits on humans as intuitive statisticians, especially human ability to evaluate probabilities of uncertain events and to identify correlation and causality. Research suggests that humans do not have an intuitive understanding of the effect of sample size on variance. This results in unwarranted conclusions from small samples (small number of occurrences). Also, humans frequently equate causality with joint occurrence. However, the occurrence of two things at the same time does not demonstrate causality. Humans also have difficulty in intuitively integrating information from multiple sources. These limits on humans as intuitive statisticians may lead to incorrect conclusions by executives about the importance or causality of factors.

Judgment as to importance may also be influenced by a variety of biasing factors, such as availability of data. Events that are most recent or that are easily remembered assume a greater importance than events that are less recent or which are not easily remembered or recalled. The critical success factors as elicited at one point in time may therefore not be stable over time. Also, decision makers are influenced by the concreteness of available data. They will tend to use the data in the form presented rather than transforming or manipulating it or rather than searching out new data.

In summary, these four underlying phenomena suggest that even though the critical success factors method will yield critical success factor responses, the factors obtained may not be complete, correct, or sufficient. What is needed is an analytical model of the business unit that the analyst can use in eliciting executive responses and with which to evaluate the critical success factors obtained from executives for relevance, correctness, and completeness. Within the framework of an analytical model and an awareness of the limitations on human ability to identify relevant factors, the critical success factors method can be very useful.

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