

Better Executive Information with the Dashboard Approach

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INTRODUCTION

After more than 30 years of research on how the work of managers can be supported by computers, the observation that developing computer systems that are truly useful for top management is a highly complex and uncertain task is still as valid as ever. Information systems for executives raise specific problems, which have primarily to do with the nature of managerial work itself (Mintzberg, 1973), as they are intended to tackle the needs of users whose most important role is “to create a vision of the future of the company and to lead the company towards it” (King, 1985, p. xi).

BACKGROUND

The major difficulty in supporting managers with computer systems comes from the very nature of management work (Mintzberg, 1973, 1975, 1976), which is concerned with communication, coordination, and people’s management for more than 80%. At the time of his research, Mintzberg (1973) had noted how little time is left for reflection and for “playing” with computer systems. This has been a significant difficulty from the origins of MIS systems because their primarily “operational” focus was not central to executives’ concerns (Ackoff, 1967; Keen & Scott Morton, 1978). Twenty years later, this difficulty has also been largely responsible for the shift from decision support systems (DSSs) to executive information systems (EISs). EISs were intended to be very easy to use and to help users manipulate required data without the need for much training, which would be very attractive to top executives who want to have, at a glance, a very comprehensive view of their business. Specific descriptions of the differences between DSSs, EISs, and cooperative decision systems can be found in Pomerol and Brézillon (1998). Naturally, computer literacy among executives has increased to a great extent, notably thanks to the development of electronic mail and the World Wide Web. However, whatever designs were put forward over the

years, it has remained true that managers are not inclined to spend countless hours browsing computer data, such is the time pressure under which they operate.

Beyond the time pressures under which executives must operate, there are issues of trust and of credibility of the information that can be found in a computer system, which mitigate against intensive executive reliance on information systems, especially in a long-term perspective. First of all, the lack of confidence of executives in their models has been noted by many researchers (e.g., Wallenius, 1975; Cats-Baril & Huber, 1987; Abualsamh, Carlin & McDaniel, 1990). The idea that decision makers need sophisticated models may actually be wrong. People in charge of the preparation of decisions would probably be able to understand and use smart models, but the high-level executives who most commonly make the final decisions are far too busy to train with and use involved systems. On the contrary, they appear to prefer simple systems that they trust and understand, and that display very timely simple information. More often, the data required to make the best decisions will already reside in some form or another in the database of the organization or can be captured with an online feed into a computer system, and what is really needed is a device to filter and display and to warn executives about the most important variances (Simon, 1977). As noted by Kleinmutz (1985): “the ability to select relevant variables seems to be more important than procedural sophistication in the processing of that information” (p. 696).

In EIS, the underlying models built into the system are normally very simple and easily understandable, which is a great help in increasing the acceptability of a computer system.

To conclude, the specificities of managerial decision making can be synthesized as follows:

- Most decisions are made very quickly under considerable time pressure (except some strategic decisions).
- Strategic decision making is often the result of collaborative processes.

- Most decisions are linked to individuals who have specific intentions and commitments to personal principles and ideas.

It is therefore very difficult to support managers, and despite many years of research, little is known about the way information systems could support such unstructured tasks.

A VEHICLE FOR INFORMATION REQUIREMENTS ANALYSIS: CRITICAL SUCCESS FACTORS

In pre-EIS days, Rockart (1979) put forward a methodology called critical success factors or CSF to guide information systems planning. The method had its advantages, though it failed to make a general impact on the planning process of organizations. Its potential in other areas, notably the development of information systems, has been explored by a number of researchers. It is argued in this article that it can be very useful as a guide for the development of executive systems, as both from an information content perspective as for the design of the interface of these systems.

CSF assumes that the performance of organizations can be improved by focusing on “the few key areas where things must go right for the business to flourish” (Rockart, 1979). In simple terms, the method seeks to isolate, using the expertise and gut feeling of managers, the factors which may make the difference between success and failure for the firm.

A number of key points about CSF make it a very attractive technique. First of all, while CSF is essentially a generic framework, it recognizes that all firms are different and operate in different markets. Thus, CSFs are different for different organizations. Secondly, the CSF theory takes into account that the needs of managers within the same organizations are also different based on their hierarchical level, but more importantly, based on their style and their specific areas of responsibility. In general, there are only a limited number of factors that each manager should monitor closely, and this guarantees that managers can concentrate their limited attention to factors that really matter and that are within their control. The attractive thing about this breakdown of responsibility is that the CSF sets controlled by the different managers add up to a complete organizational set that covers all the key areas of the business.

Van Bullen and Rockart (1986) identified a number of primary categories of CSF that are useful in guiding the analysis of the organizational CSF set. These generic sources of CSFs are: (1) the industry where the organiza-

tion operates (these CSFs are shared by mainstream organizations in this industry), (2) the competitive position and strategy pursued by the organization (which are unique to its set of circumstances and objectives set by its top managers), (3) the environmental factors surrounding the organization (which it has no control over, but which it must monitor closely to compete), (4) temporal factors (which relate to specific events or change programs currently facing the organization, and require the temporary monitoring of additional factors), and finally, (5) CSFs that are specific to each manager and their role in the company. Other authors have added other potential sources such as CSFs related to the analysis of main competitors (especially industry leaders) and the evolution of their business (Leidecker & Bruno, 1984). These sources add up to a wealth of potential factors and measurements that are sufficient for effective monitoring of the business of most organizations.

Dashboards and Control Rooms

In the next stage of the development of executive systems, designers must create an interface for displaying the CSFs. The design of this interface is nearly as important as the selection of the indicators in shaping the perception of managers of the usefulness of their information systems and keeping their interest in the long run. One technique that has worked well in selecting and presenting indicators is the application of the dashboard concept to the management of organizations.

Fundamentally, the concept of dashboard reflects the application of the concept of control room to the management of the firm and echoes the call for a warning or exception reporting functionality in EIS-type systems. In engineering, the control room is a specially designed physical area of a plant where the proper operation of key equipment can be monitored. Control rooms have developed because of the need to monitor increasingly complex processes, such as petrol refining or the operation of nuclear power plants. The control room allows operators to control a process without looking at it with their own eyes, and with a degree of accuracy and completeness that could not be achieved with human perception alone.

This suggests that dashboards may be developed that considerably help managers in their day-to-day search for problems and matching solutions. Naturally, the nature of management itself is highly dynamic and diverse and involves consideration of infinite number of parameters in a way that is fundamentally different from the monitoring of a manufacturing process. Thus, management has a significant “human interaction” component that cannot easily be supported by computer systems. Simon (1977), Gorry and Scott Morton (1971), and others have com-

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