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EXECUTIVE USE OF INFORMATION TECHNOLOGY: WHAT HAVE WE BEEN MISSING?

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Abstract

Evidence suggests that executives are not benefiting from the investments in Executive Information Systems (EISs). The authors propose distinguishing between formal, or deliberately designed, EISs and emergent EISs. Most research has been directed toward formal EISs, and this study posits that recursive, ad hoc uses of information technology (IT) result in emergent systems that perhaps are more highly valued than the formal, deliberately designed, systems. The study comprises structured interviews with executives in a selected number of industries to identify the actual patterns of use of IT and the forms and extent of these emergent systems. This study contributes to our knowledge about EISs by studying systems as they have emerged in practice rather than as they have been designed. The findings are expected to contribute both to the richness of EIS research approaches and to the practical knowledge of how executives use information technology.

The Issue

Executive decisions require current and relevant information. The age-old question facing an executive is how to select from the wide range of information that is available. As computer systems and information technology (IT) advanced in the 1960s and 1970s, developers believed that they could design executive information systems (EISs) or Executive Support Systems (ESSs) that would meet executives' information needs. Early systems, however, produced more paper reports than were read. Rockart, in his widely cited paper (Walstrom and Leonard, 2000), suggested that the solution was to reduce the amount of information to a set of salient indicators—the critical success factors—and to present these using display technology (Rockart, 1979). In a later article he described employing this approach in practice (Rockart, 1982). In the 1979 article, Rockart described alternative information collection methods executives might use to satisfy their information needs. One of these, what Rockart called the null approach, depended on interactions with trusted advisors and did not depend on information technology for its success.

In the intervening twenty years, IT has advanced dramatically: firms have access to faster, less expensive computers and display technology, and the ease with which organizations can collect and sift through relevant data exceeds what might have been imagined in 1979. Additionally, we have had over two decades of research on EIS design and implementation. Notwithstanding such research, technical advancements, and implementation experience, recent research indicates that few executives use EISs, and the benefits of such systems are not highly rated (Poon and Wagner, 2001 citing Fitzgerald, 1994; Rainer and Watson, 1995; Benard and Satir, 1993; Fisher, 1995). It is almost inconceivable that with advances in IT and the ubiquitous applications, CEOs have been isolated from these developments.

Why are successful EISs so rare? Are we to conclude that executives do not benefit from advances in IT? Or are executives still using what Rockart (1979) labeled the null approach, in which they do not use information technology at all? Or should we adopt alternative models that describe how executives use information technology?

This study is an exploratory study of how top executives—defined for the purpose of this study as CEOs and their direct reports—actually use information technology (IT) in practice. IT for this study encompasses telecommunications and computer technologies, including, but not limited to, a) computer applications accessed via the Internet, intranets, and local area networks; b) video conferencing, telephone, and voice mail; and c) personal digital assistants and their variants.

The study posits that executives benefit from IT in ways that the traditional research efforts on Executive Information Systems (EISs) have not fully captured. EISs typically are defined as systems that have been especially designed to meet the information needs of top managers. EISs include both internal and external information sources and provide this information in formats that meet executives' expectations (Watson et al., 1991).

We posit that through their use of IT over time, executives develop regular, structured patterns of IT use, and that these uses of IT may be viewed as EISs-in-use or EISs-in-practice (EISPs). Such *emergent* EISs, similar to emergent strategies (Mintzberg and Waters, 1985), result not from a deliberate EIS design effort but from rather from trials and learning by executives and their organizations. In other words, the systems *emerge* from the executives' information-seeking practices.

The Study

The aim of this study is to explore the components and forms of EISPs by addressing the question "how do executives actually use information technology in their work?" The approach uses structured interviews with chief executive officers and executives reporting to the CEO in selected industries. The questions address the executives' attitudes toward information technology and information systems, the role of IT in their organizations, and their personal use of IT in their daily routines. We believe that the results of the study may reveal that, contrary to conclusions that executives do not benefit from EISs, they use, and benefit from, emergent systems, or EISPs.

The study is expected to identify the components and forms of such emergent systems and to provide a basis for further understanding how to use IT for supporting executive work. The method is to conduct telephone interviews with CEOs and a sample of their direct reports in three or more organizations within the same industry. The chosen industries include a) delivery services and trucking (e.g., Federal Express, UPS, Roadway), b) higher education, c) government, and d) consulting firms. These industry groups and organizations are chosen because the authors and their colleague have contacts with organizations representing the industries and because the organizations use IT extensively in fulfilling their primary services and in adding customer value (e.g., shipment tracking, online registration, client services). The telephone interviews are expected to be supported by submitting a preliminary list of questions to the executives.

Although the study is informed by theories and past research on executives' decision making approaches and their use of EISs (Rockart, 1982; Shank et al., 1985; Watson and Frolick, 1993), the research method is best described as an exploratory, a grounded theory approach. By framing the question in terms of executives' use of *information technology* (rather than in terms of their use of *information systems*), we anticipate reducing what we believe may be a bias toward visions of systematically developed, purposeful systems. Moreover, we believe that many past studies of EISs and ESSs were based on unstated assumptions and models that may be less useful in today's world. Examples of these unstated assumptions and models include: single decision maker (rather than a team that uses a decision process), the "null approach" does not use IT for support, and the critical success factors change only slowly with time.

Possible Outcomes and Implications

By reducing what we believe to be model bias and by explicitly avoiding some of the hidden assumptions of past studies, we expect the study to develop one or more alternative models of how executives use information technologies. We posit, for example, that executives use IT, but not necessarily in ways that are captured by the normal use of the term "executive information system." We also expect that executives will judge that their use of IT (but not necessarily their use of EISs) enables them to be more effective. (We recognize that the opposite could be true—that executives do not use IT much at all and what Rockart termed the null approach still dominates.) Specifically, we can anticipate one or more of the following possible outcomes:

- Executives use IT to create closer working relationships among members of decision making teams; IT enables more effective decision making processes
- IT is used to support middle and top management (but not CEOs), but CEOs benefit by getting better advice and counsel from the management team
- CEOs view IT as part of an essential "infrastructure" rather than technologies embedded in separate, specialized decision support systems

Significance of the Results

The results have both theoretical and practical implications. As an exploratory study, the research findings are not expected to be definitive but rather to suggest new approaches to research on executive use of information systems and to the design of ESSs.

If we are correct and the outcomes support our notions that executives use IT in ways that are not captured by models and assumptions embedded in research on deliberately designed EISs, then we may need to rethink how we model IT use. Instead of modeling executives' *use of deliberately designed systems*, we might approach the decision-making system more broadly and examine how executives *perform as components in a decision-making system*. Information technology may be viewed as one component in a socio-technical system. The technology affects the social and organizational structure, and recursively, its use is affected by these same structures (Orlikowski, 1992).

From a practical viewpoint, approaching the design and implementation of EISs and ESSs as deliberate, pre-determined systems, may produce a suboptimal organizational system. In other words, if we draw the system boundary around only the formal information system, the performance of the overall executive support system may be lower than if we broaden the boundary to include all executive uses of IT. Designers may want to consider expanding the system boundary and considering other components (organizational structure, organizational culture, executives' style, etc.) in their design. More fundamentally, designers may want to consider providing information technology as part of a general business process support infrastructure that enables executives to design their own systems as needed.

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