

## Introducing executive information systems into organizations: separating fact from fallacy

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Several factors have been proposed by researchers to explain why organizations are motivated to introduce executive information systems (EIS) now. These are identified and categorized in this paper and the results of an empirical study which examined the relevance of these factors in practice are presented. The findings of the study question the relevance and validity of some of the factors that have been identified – most notably that EIS are being introduced at the request of executives who are becoming increasingly computer literate and see EIS as a means of coping with today's extremely competitive business environment. The study findings suggest that IS department push and *EIS envy* are factors which play a significant role in the emergence of EIS in organizations.

### Introduction

The concept of providing timely and relevant information to top management is one that has attracted the attention of researchers in the information systems (IS) field since computing was introduced into organizations (Burlingame, 1961; Dickson, 1978; Rockart and Crescenzi, 1984; Applegate *et al.*, 1988). In the past, different types of computer-based information systems have been promoted to address the information needs of top management. Management information systems (MIS) and decision support systems (DSS) have both been offered as suitable systems (Dickson, 1968; Sprague, 1980). However, many researchers have concluded that both MIS and DSS have failed to satisfy top management's information needs (Ackoff, 1967; Gorry and Scott Morton, 1971; Dearden, 1972; Alter, 1980; Jones and McLeod, 1986). Most recently, executive information systems (EIS) have emerged as the favoured candidate for providing top management with the information that they require (Rinaldi and Jastrzembski, 1986; Melymuka, 1989; Fireworker and Zirkel, 1990). These systems are designed to provide status information on the key performance indicators to executives (Rockart and De Long, 1988; Harvey and Meiklejohn, 1989). This contrasts with DSS which were seen as providing both a modelling and an information retrieval capability (Bonczek *et al.*, 1980; Sprague, 1980) and MIS viewed as providing information from operational systems (Ackoff, 1967; Gorry and Scott Morton, 1971).

A number of factors have been identified as being highly relevant to the emergence of EIS. These factors, which are discussed in detail in the next section, may be summarized under three broad categories, namely, an

increased readiness on the part of executives to make use of computers, the increasingly competitive nature of today's business environment and, finally, the availability of appropriate enabling technology. These factors represent a plausible argument as to why EIS are now emerging. The competitive nature of the market-place requires executives to react more quickly and effectively if the organization is to remain competitive (Rockart and De Long, 1988; Shoebridge, 1988; Paller and Laska, 1990). Consequently, they need timely and relevant information, and good filtering and presentation mechanisms. Executives are also more aware of the potential of computer technology to support their work and are willing to make use of computer systems (Paller and Laska, 1990). Complementing this is the fact that technology has evolved to the stage where computer-based support for top management may be feasible (Rockart and De Long, 1988; Main, 1989).

However, until quite recently, very little of the research on EIS has been of an empirical nature (Fitzgerald, 1991). Consequently, the research reported in this study attempted to help address this weakness in EIS research. It was concerned with evaluating the role which these three factors played in the introduction of EIS in organizations. The study also sought to determine if any other factors were relevant to the introduction of EIS and, based on the findings, to suggest the issues that organizations should address when deciding to introduce EIS.

The next section considers each of the literature factors mentioned above and discusses them in turn. Following this, the results of an empirical study which sought to determine the relevance of these factors are presented. The findings of the study show that not all of the factors cited in the literature are relevant and identifies other

factors which were found to have been significant. The implications of these findings are discussed and conclusions drawn.

### The emergence of EIS

The concept of EIS was first developed by Rockart and Treacy (1982) and while there are many differing definitions of EIS, there is broad agreement on the characteristics of EIS. They are targeted at top management, are easy to use, invariably making use of a graphical user interface, they can capture both external and internal information of relevance to executives (Watson *et al.*, Koh, 1991), they can also cater for soft, non-quantitative information and can provide highly-aggregated information, while still allowing selective 'drill-down' to the underlying detail if required. Trends can be monitored and represented graphically and various office support functions such as electronic mail and diary and calendaring facilities are often provided (Rockart and De Long, 1988).

The factors identified in the literature to explain the emergence of EIS may be categorized under three broad factors.

- (1) An increased readiness on the part of executives to make use of computers (Rockart and Treacy, 1982; Rockart and Crescenzi, 1984; Houdeshel and Watson, 1987; Rockart and De Long, 1988; Williamson, 1989; Paller and Laska, 1990; Watson *et al.*, 1991).
- (2) The competitive nature of today's business environment (Rockart and Treacy, 1982; Reck and Hall, 1986; Burkan, 1988; Rockart and De Long, 1988; Shoebridge, 1988; Harvey and Meiklejohn, 1989; Fireworker and Zirkel, 1990; Volonino and Watson, 1990; Friend, 1991; Watson *et al.*, 1991; Wetherbe, 1991).
- (3) The availability of appropriate enabling technology (Rockart and Treacy, 1982; Rockart and De Long, 1988; Paller and Laska, 1990; Whymark, 1991).

These factors are discussed and elaborated on below.

#### Increased readiness of executives to make use of computers

Researchers have identified a number of areas in which EIS can provide significant benefits to top management, namely

- (1) improved efficiency, especially in the communication role (Rockart and De Long, 1988; Rath, 1989; Paller and Laska, 1990).

- (2) increased span of control (Rockart and De Long, 1988; Paller and Laska, 1990);
- (3) easing of information overload (Rockart and De Long, 1988; Harvey and Meiklejohn, 1989);
- (4) direct personal access to information rather than through intermediaries (Rockart and Treacy, 1982; Harvey and Meiklejohn, 1989; Turban and Schaeffer, 1989; Paller and Laska, 1990; Watson, Rainer and Koh, 1991);
- (5) improved mental models of the business (Rockart and De Long, 1988)

These benefits, coupled with the results of studies which show that many executives are now willing to make direct use of computers (Rae, 1986; Rockart and De Long, 1988), have led researchers to suggest that executive demand is a significant factor in the introduction of EIS. For example, a study carried out in the USA reported that executives were the initiators of EIS development in 68% of cases (Watson *et al.*, Koh, 1991). Similarly, in the UK study, Fitzgerald (1991) reported that top management were the originators of the decision to introduce EIS in 65% of cases.

#### The increasingly competitive nature of the business environment

The accelerating pace of business – the 'faster metabolism of business today' (Rockart and De Long, 1988, p. 100) – has also been widely cited as a reason why EIS are now emerging. The move is under way from an inventory-based world to a just-in-time based world, with companies shifting emphasis from global marketing strategies to micromarketing, focusing on the buying habits of specific age groups in specific geographic areas (Friend, 1991). The need to leverage information technology to create competitive advantage is now a major area of IS research and several researchers have suggested that EIS can help an organization achieve this elusive competitive advantage (Shoebridge, 1988; Paller and Laska, 1990). Executives are faced with growing challenges in running their organizations and they require more timely and relevant information (Rockart and De Long, 1988; Paller and Laska, 1990). Traditional computer-based information systems cannot cope with this demand – they have been designed around the historical reporting of internal information, whereas external information is extremely important for executives (El Sawy, 1985; Jones and McLeod, 1986; Rockart and De Long, 1988). By managing information better, executives can manage the organization better and the hope is that EIS can help by providing the executive with the right information in the right format and at the right time.

In addition, the literature contains many examples of companies who were facing serious survival-threatening

crises and chose to develop EIS (Rockart and De Long, 1988; Harvey and Meiklejohn, 1989; Fireworker and Zirkel, 1990; Paller and Laska, 1990). These systems are suggested to have played a major role in the survival of these companies, both by helping them focus on information vital in addressing their business problems and also by sending an image-enhancing signal of the company position to the market-place. Indeed, it has been suggested that executives are more likely to support EIS development in turbulent circumstances (Burkan, 1988).

### Availability of appropriate enabling technology

The inadequacies of previous technology have been used to explain the unwillingness of executives to use computers directly in the past (Volonino and Watson, 1990). However, major technological advances in recent years, most notably the advent of the personal computer, have seen the emergence of applications that would have been technically impractical or infeasible only a few years ago. Graphical user interfaces have eliminated the need to learn the syntax of a command language – a mouse or touch-screen may be used instead of a keyboard to drive an application (Melymuka, 1989). It has been suggested that EIS should be intuitively easy to use, with a learning curve of perhaps only a few minutes (Rinaldi and Jastrzemski, 1986), thus providing a relatively effortless link between the executive and key data (Rees-Evans, 1989). Graphical presentation formats can also enhance system output quite significantly (Turban and Schaeffer, 1989). For example, executives may be more interested in broad trends than precise figures and, given the graphical capabilities of these systems, these trends can be presented in a readily assimilable form.

These technological advances which make available the right combination of hardware and software have been accompanied by a major push from commercial vendors to market EIS. However, a serious problem arises when vendors stage impressive demonstrations of EIS. Expectations are built up that EIS will provide instantaneous access to internal operational databases and to any relevant external information. The eventual system may not be able to match these expectations and EIS could be on course for failure from the outset (Paller and Laska, 1990).

### Research study

The factors cited by previous researchers to explain why organizations are now introducing EIS are quite convincing. However, in many instances, they are the rational arguments of those who are strongly in favour of EIS and are arguments that have not been sufficiently subjected to empirical validation. If these widely cited factors are

indeed significant drivers in the development and implementation of EIS within organizations, then it would be reasonable to expect a high percentage of successful implementations of EIS. However, the findings of previous research studies show that a significant percentage of EIS implementations are unsuccessful – more than 50% (Rockart and De Long, 1988).

Consequently, the primary objective of the research was to ascertain the extent to which the factors proposed in the literature to explain why organizations were now introducing EIS were relevant in practice and to discover any other factors that were relevant to the introduction of EIS.

### Research methodology

An empirical study of organizations that have implemented EIS was undertaken. The study was carried out in four organizations, drawn from the food processing, finance and state sectors. It was decided to restrict the number of participating organizations to four and to leverage depth in the number and the role of those interviewed, from CEOs to functional personnel. All of the companies used a commercial package to develop EIS and, although all had developed an EIS the length of time since the initial system had been developed varied from 11 to 26 months. Table 1 provides a summary of the organizational details.

The research comprised a series of personal interviews with several key personnel in each organization. While many of the questions raised were open-ended, questionnaires were used to aid the interview process, thus ensuring that all interviews followed the same general format. Twenty-one people were interviewed and the mean duration of each interview was just under 2 hours. The interviewees fell into two categories – EIS developers and EIS users – with separate questionnaires used for each group. The EIS developers were from the IS department in three of the four organizations. In the remaining organization, EIS development was outsourced to external consultants, but coordinated by a manager in the finance department who acted as the EIS director. The EIS users were categorized into executive managers (chief executives/managing directors, board members) and middle managers. Table 2 provides a summary of the interviewee characteristics.

**Table 1** Characteristics of organizational sample

	Mean value	Low value	High value
Annual turnover (£million)	418	197	700
Number of employees	2150	600	4000
Length of time since EIS initiation (months)	19	11	26

**Table 2** Interviewee characteristics

	Numbers interviewed	
EIS users	12	
Executive managers		8
Middle managers		4
EIS developers	9	
IS personnel		6
Other		3

### Analysis of findings

The results of the interviews were analysed to determine the importance of the factors previously discussed. The findings are summarized in Table 3 and each is discussed in detail in the following sections.

#### Increased readiness of executives to make use of computers

As can be seen from Table 3, the suggestion that EIS are being introduced because of an increased readiness among executives to make use of computers is not supported by the findings of the study, with only one executive citing it as a relevant factor. In the organizations studied, executives did not play a prominent role in the decision to implement EIS. Typically, executives were first introduced to the EIS concept by others in the organization (generally personnel from the IS department), in some cases only after the initial system had been developed (see Table 4). In most organizations, executives were not really aware of the EIS concept, contrary to the literature (Paller and Laska, 1990). For example, several executives (25%) requested basic documentation on the concept of EIS from the EIS directors in their organization, prior to being interviewed. In a number of cases (38%), executives also requested that EIS directors be present during the interviews and frequently consulted them before answering even fairly routine questions on the use of EIS in their organization. These executives seemed to be quite

**Table 4** Introduction of executive to EIS concept

Source	Percentage
IS personnel	63
Internal peers	25
External peers	25
Literature: journal articles, etc.	13

Note: some interviewees cited more than one of these sources.

unaware of the manner in which EIS was being used in their organizations.

The majority (68%) of users of EIS in the organizations studied were at middle management level (see Table 5). Nor was it a case of these middle managers using EIS on behalf of executives. Rather, they were using EIS for their own work – monitoring budget variances, analysing sales performance, conducting sales demonstrations, etc. Table 5 shows that there was a mean of 15 users per organization, which is in keeping with a previous study (Fitzgerald, 1991) which reported a mean of 13 users per organization.

Even though Table 5 shows a figure of 32% of users of EIS at the executive level, in fact few executives (less than 50% of executives with access) made significant direct use of these systems. Even given the user-friendliness of these systems – a *sine qua non* for EIS – some executives reported their frustration with EIS and were not comfortable or confident about using these systems. For example, in one organization, the EIS developers had developed a system for an executive to conduct boardroom presentations. However, they had configured the system without any ‘exit’ option – the rationale given was that the executive would not be capable of getting back into the system if he inadvertently chose the ‘exit’ option.

Likewise, the majority of executives did not rate the benefits of EIS very highly. The functionality provided by EIS systems seemed in many instances to outweigh the demand made on them by users. Very few executives were capable of manipulating ‘traffic lighting’ tolerance ranges themselves or made use of any ‘drill-down’ facilities. Table 6 summarizes the ratings by executives of EIS in terms of ease of use and benefits provided.

**Table 3** Assessment of relevancy of factors in the introduction of EIS

Factor	Number of interviewees	Percentage	Number of organizations
Availability of appropriate enabling technology	15	71	4
IS department push	10	48	3
Competitive nature of the business environment	4	19	2
Increased readiness of executives to use computers	1	5	1

**Table 5** Users of EIS by organizational level

	Per organization			All organizations	
	Mean	Minimum	Maximum	Total	Per cent
Executive management	5	2	10	18	32
Middle management	10	3	23	39	68

**Table 6** Executive rating of EIS

Dimension	Mean rating	Minimum rating	Maximum rating
Ease of use (1 (very difficult)– 5 (very easy))	3.6	2	5
Benefits provided (1 (little benefit)– 5 (major benefit))	3.2	1	4

While there was little evidence in support of executives being pro-active in the introduction of EIS, there was evidence of executives seeking access to EIS in a reactive sense. For a number of executives (38%) internal organizational politics was a significant factor in their becoming involved in the EIS process. These executives sought access to EIS through fear that they might be marginalized if other executives had access and they did not. The executives in question had been granted access to EIS, but they did not consider these systems useful and were not using them. However, they wanted to continue having access because they were uncertain as to the role EIS would eventually come to play in their organizations. While it would be more desirable that executives requested access to EIS because they believed EIS could benefit them, this political motivation could be interpreted as a rational investment by executives and cannot be discounted. This finding is consistent with previous research which has identified the importance of political factors in the use of computer-based information systems (Feldham and March, 1981; Robey and Markus, 1984).

#### Nature of the business environment

Even though interviewees did not explicitly identify the nature of the prevailing business environment as a factor in their decision to introduce EIS (see Table 3), there was evidence that implicitly this was a factor: in two companies, there was a fear that competitors might be able to use EIS to raise the competitive threshold in some way. Thus, for some executives, the development of EIS

represented a defensive strategy. For example, the chief executive in one organization described himself as 'too old to learn about computers now' and was of the opinion that EIS would not be of any direct benefit to him, but he was very supportive towards EIS development – his reasoning being that it was safer to invest in these types of systems, rather than risk having competitors use them and perhaps gain competitive advantage. However, because EIS development was seen as a defensive strategy, with executives generally not perceiving EIS as having any significant benefits for them (see Table 6), the majority of executives (63%) were not prepared to become involved in the development process. It represented a project that might reap some dividend, but it was not being allowed to consume much of their time or attention.

Writing about the MIS approach more than 20 years ago, Dearden (1972) referred to 'the growing complexity and the pace of change of modern business'. The rationale behind the emergence of DSS has also been ascribed to the competitive nature of the business market-place (Kenn and Scott Morton, 1978; Lu *et al.*, 1989). The suggestion that organizations are now motivated to develop EIS due to the competitive nature of the business environment may thus reflect perhaps an argument frozen in cliché rather than a true causal factor. Certainly, the findings of this study do not strongly support the argument that the competitive business environment was a significant factor in the emergence of EIS.

#### Availability of appropriate enabling technology

The availability of appropriate enabling technology was a very significant motivating factor in the introduction of EIS, cited by more than 70% of those interviewed (see Table 3). The desire to be at the forefront of technological advances was very strong in each of the organizations studied – even to the extent that it was part of their publicly-stated policy. All the organizations rated themselves as very advanced in the use of new technology (see Table 7).

This desire to be perceived as technologically advanced resulted in a tendency to view EIS in fairly simple terms as an innovative technological *product*, rather than as a *process* which involves a more fundamental examination of the nature of executive work and how it can be supported. For

**Table 7** Interviewee rating of organization's keeping abreast of technological advances

Dimension	Mean rating	Minimum rating	Maximum rating
Extent to which organization keeps current with new technology (1 (not at all)–5 (very up to date))	4.38	4	5

example, in two companies, EIS developers seemed to make the assumption that data and information were synonymous and a simplistic view of executive information requirements was taken, with information being captured in the EIS based on the extent to which the information lent itself to capture rather than because it was actually requested by executives. In one company, an executive expressed the opinion that this kind of strategy caused EIS to contain a 'ragbag of information'. In the other company, an executive drew the distinction between 'information that is nice to know, and information that one needs to know' and he was of the opinion that a lot of the information in his company's EIS fell into the former category.

Two of the organizations had expended considerable effort and resources in establishing network connectivity throughout their organizations. This represented a high-profile and expensive undertaking and they were very keen to provide services on this medium. Thus, EIS were seen as having 'come along at the right time', in the words of one EIS director.

This emphasis on what the technology could deliver rather than on business information needs disguises the fact that providing the executive with the right information at the right time and in the right format is the real problem when it comes to developing EIS. Researchers have stressed the critical importance of the information content of EIS (Volonino and Watson, 1990; Watson *et al.*, 1991), but this was not a high-priority concern for EIS developers in the organizations studied.

### IS department push

The above findings relate to factors that have been identified by previous researchers as being important. A significant finding of this study was that the IS department were a major force in the decision to develop EIS in three of the four organizations studied (see Table 3). Previous research has suggested that the IS personnel do not play a central role in the development of EIS (Houdeshel and Watson, 1987). The arguments against IS

department involvement concern their overemphasis of technical issues and their lack of business acumen and overall business-focused skills. IS practitioners have been criticized for being excessively tool oriented, looking for simplistic technocratic solutions without ever coming to terms with the complex reality of the management process (Earl and Hopwood, 1980). While IS personnel may be well aware of the need for a more business-focused approach, mere acknowledgement of this need does not resolve the fundamental deficiency in business-focused skills.

A number of issues were identified in the study as underpinning this push from the IS department for EIS development. The term *EIS envy* was coined during the research study to describe the situation whereby organizations choose to develop EIS because it represents a high-profile project that progressive organizations are undertaking. For example, one EIS director (also the director of the IS department) stated that he had been very enthusiastic about EIS because it gave the IS department a 'with it' image'. Another EIS director, again from an IS department, expressed his concern that overseas subsidiaries of the organization were 'moving in this direction (*EIS development*) and could steal a march on us'.

In another organization, an attempt had been made a number of years earlier to provide executives with direct access to management information using their existing MIS system – a mainframe-based relational database package. The IS department had great hopes for the project, but it had proved unsuccessful as executives were not comfortable with the user interface – a hierarchical menu-based system with a vast range of options. The EIS director expressed the view that the image of the IS department had been 'tarnished by the whole exercise' and he was keen to make amends. He was quietly confident that EIS would be accepted this time around.

Thus, EIS development is viewed very enthusiastically by the IS department. It has the intrinsic value of being an exciting high-profile project in itself and for the IS department, perhaps outside the strategic epicentre in many organizations, it also affords an opportunity to win back some influence at top management level.

However, the significant involvement of the IS department in the organizations studied had a number of negative implications. Firstly, the IS department did not always have ready access to executive management and so their main contact was often with middle management, which may help explain why the majority of users (68%) of EIS in the study were at middle management level (see Table 5). Even though the ability of developers to work well with executives has been identified as one of the most important factors for successful EIS implementation (Watson *et al.*, 1991), IS personnel in this study were not accustomed to working with executive management. In one company, the EIS developers stated that EIS

development had afforded them the opportunity of their 'first visit to the executive boardroom'.

Many researchers make the point that executives and their work are not well-understood. They have preserved 'the orality of their culture . . . and the opacity of their know-how' (Zuboff, 1988, p. 178) and a lot of their work remains a mystery (Rockart and De Long, 1988, p. 41). Research suggests that the biggest ongoing worry for EIS developers is that of identifying executive information requirements (Paller and Laska, 1990). However, since IS personnel in this study did not typically have ready access to executive management, this led to the development of systems without any real executive input into the design process. There was a tendency among EIS developers in the study to view both executives and executive information systems in stereotypical terms, with no real consideration given to the possibility that different executives could have different information requirements.

Quite often, IS personnel were scathingly critical of executive management for their ignorance of computing concepts and unwillingness to embrace the technology. One is reminded of the anecdote that an apple-grower would criticize Newton for not telling all there is to know about apples. The IS department have, in similar fashion, taken the wrong focus. They are used to providing technical solutions to clearly defined problems. Their primary focus is on getting the technical aspects right and a lot of emphasis is placed on improving speed of data access, but instant operational data is not what is wanted. The vitally-important knowledge of how the business should be run and the information that is required to support this forms part of the wisdom of top management. The knowledge of how to develop successful information systems should be the contribution of IS personnel, but it is vital that this does not overshadow actual business needs.

### Summary and conclusions

The findings of this study question the validity of two of the factors widely cited to explain why organizations are choosing to introduce EIS. Firstly, the suggestion that increasingly computer-literate executives are leading the demand for these systems is not supported. The argument that the competitive nature of the business environment forces organizations to consider developing EIS is also questionable since interviewees did not rate this as a factor. In fact, the availability of appropriate enabling technology was the only 'literature' factor supported by the findings of this study. However, an important implication of this is that there was a tendency to view EIS in simplistic terms as an innovative technological product, thus mitigating executive involvement from the outset.

IS department push was found to have been a very significant factor in the development of EIS. However, IS personnel were not really able to command executive attention and there was evidence of inadequate communication between both groups. The main criterion for the inclusion of information was the extent to which it lent itself to ready capture, with executives left out of the equation when it came to identifying actual information requirements. The principal reason behind the IS department involvement in the introduction of EIS was that of *EIS envy* – the desire to develop EIS because organizations, perceived as being progressive, had developed EIS and had thus achieved high-profile coverage in their industrial sector and in the media. However, the danger associated with this approach, as evidenced by this study, is that it tends to bias towards a simplistic view of stereotypical EIS for stereotypical executives, thereby omitting the important contextual issues.

Even though executives were not pro-active in introducing EIS in their organizations, there was support for EIS from executives in the organizations studied. Two primary factors were identified as underpinning this support. Firstly, for the more senior executives, EIS development represented a defensive strategy in that they feared that competitors might raise the competitive threshold somehow through the use of EIS and they wanted to safeguard against this eventuality and thus supported EIS development, although they were not prepared to become really involved in the process. The second factor underpinning executive support for EIS development had to do with internal organizational politics. This was more prevalent in the case of the less senior executives. Basically, these executives sought access to EIS because they were not sure what role EIS would eventually come to play in their organizations. They feared being marginalized if other executives, especially senior executives, had access and they did not. But again, these executives were not prepared to devote a lot of time and attention to the development process.

While the results of this study should be regarded somewhat tentatively, based as they are on a sample of four organizations, they do suggest that the argument motivating organizations to develop EIS could be cast as follows. Technological advances have overcome the problems traditionally associated with top management's reluctance to use computers. The research and popular literature is replete with evangelical examples of successful EIS implementations and this is fuelling the IS department's desire to be involved in this kind of high-profile undertaking. Consequently, they are pushing hard to introduce EIS into their organizations. However, executives are also willing to support EIS development, because, unsure of the role it eventually might come to play, they fear that, externally, competitors could use it to gain advantage or, internally, that they could be

marginalized if EIS comes to play a significant role and they do not have access.

Some researchers suggest that EIS fulfil the hopes that were initially articulated for MIS back in the 1960s, namely systems that meet the key information needs of executives and other strategic personnel throughout the organization (Volonino and Watson, 1990). However, others argue that EIS may not deliver to the extent predicted and may even reinforce every negative stereotype of MIS (Melymuka, 1989). The simplistic technological product-oriented view of EIS that this study found prevalent is not encouraging, and does not augur well for the future of EIS in progressing past the stage of initial experimentation to real integration into the executive managerial process. The paradox emerges that executives will not use EIS until they become an essential part of the management process, but this will not happen unless executives commit adequate time to the process of developing EIS.

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