

Factors affecting the Implementation a Successful Executive Information System

Dr. Amine Nehari-Talet

*King Fahd University of Petroleum & Minerals
College of Industrial Management (AACSB accredited)*

Email- nehari@kfupm.edu.sa

Abstract __In today's highly dynamic and competitive business environment, the globalization of business and the merging of computers and communication technology are redefining the way in which organizations operate and compete in such environment. These changes necessitate that executives working need more effective ways to analyze their markets and competition and guide their operation and people for organizational survival and success, which requires that relevant information must be made available to the executives to assist them in decision making. Executives play the vital role in establishing the future directions and strategic orientations of organization; Executive information systems (EIS) can help executives to have access and use the information they require about the organization's internal and external environments.

An empirical study was conducted in Saudi Arabia's companies, (100 top companies) based on 2003 turnover. The findings of this study provide a better understanding of factors that makes EIS successful.

1 Introduction:

With the rapid growth of information technology, this has changed the working environment of organizations. These changes have effected the communication, co-ordination and management operations inside the company. This greater accessibility of data allows the executives to stay more close to the external environment changes that could initiate them to plan new business strategies. Beside, timely and relevant information, information technology has also changed the way of executives work.

In past, information systems were only supposed to gather, store and to produce reports for the managerial levels. However, senior managers rarely used these systems directly and often find the aggregate information to be of little use without the ability to explore underlying details. The primary task of senior executives is to manage and control their business. As (Mintzberg.,1992) indicates, *"In almost every serious study of managerial work the formal information—in other words, information capable of being processed in a compute does not play a dominant role. Oral information—much of it too early or too 'soft' to formalize, such as gossip and hearsay—and even nonverbal information forms a critical part of every serious managerial job."*

In response to the previously discussed issues, a new system named **"Executive Information System"** came into existence with the objective to ease the business decision making for the senior executives. EIS today has become an increasingly important tool for top executives.

Executive Information Systems (EIS), also known as executive support system (ESS), is a new technology in response to the situations where there is increased competition, rapid changing environment, increased government regulations and where executives need timely information, improved communication, access to operational data, rapid status updates on different activities, to be able to identify historical trends and more accurate information. EIS is becoming very popular day by day due to a high competition in the market and lack of time for decision making as well. The traditional view that EIS support only senior executives is being challenged as more and more managerial levels are gaining access to EIS. EIS popularity is increasing due to a high competitive market where business environment is very uncertain.

Several authors have defined EIS in different ways, which are as follows:

According to (Arun Rai & S. Bajwa., 1998) **EIS** is, "A computer based information system for a key executives and managers providing them with sophisticated capabilities to support their communication, co-ordination, planning and control functions." (Paller & Laska., 1990) has defined EIS as: "A computerized system that provides executives with easy access to internal and external information that is relevant to their critical success factors." According to (Efraim Turban., 1995) EIS is "A computer-based system that serves the information needs of top executives." "A highly interactive MIS combined with DSS and artificial intelligence for helping managers to identify and address problems and opportunities." (Leidner & Elam., 1994) defined EIS as *"monitoring and scanning of the*

environment to give executives rapid exposure to changes in the environment” A more detailed definition by Stevenson reflects “the ability of a system to make the information contained in the lower-level systems in the organization available in a form that is easy to access, easy to use, and germane to decision making”. (Young & Watson., 1995) defined EIS as “a system that provides executives with access to external information such as news, regulations, and competitive analysis”

2 The research Context:

Obviously since the time of **F. W. Taylor** and Scientific Management (Taylor., 1911; 1947) the impact the technology has been debated for many years, upon the working lives of people. Debates, related to the impact of information System (**IS**) on people in organizations, began to emerge much afterward with the increased awareness of the importance of information technology in business, organizations started to spend huge amount of money in the implementation of (**IS**). Many organizations found that a large number of these computerized systems did not attain the desired outcome and were consequently considered as failures by the organizations themselves. These are named “correspondence failures” (Lyytinen & Hirschheim.,1987). Research into computer system failures discovered that whilst some were attributable to technical defects, or budgetary problems (Brooks., 1975), (Buechi., 1982), a large proportion of these were the consequence of failing to consider the social field within which the systems were implemented, resulting in an inability to meet the expectations of the social group for which the system was intended (Lucas., 1975); (Lyytinen & Hirschheim., 1982) more recent studies indicate that the situation is not improving (Saucer., 1993), Doherty & King., 1997).

One of the roles associated with the job of a manager involves taking decisions. The scope can vary, depending on the manger’s position within the organization.

At the higher level of the organizational management hierarchy are executives. Decisions that executives have to take are therefore particularly important since they primarily affect the long-term future of the whole of the organization. In order to carry out their jobs effectively, executives base their decisions on accurate, timely, reliable information relevant to the variables involved in the decisions.

Although there is some disagreement on the amount of **IS** investment in the literature, it is evident that organizations recognize **IS** as one of the most important weapons for their survival and success in a highly competitive environment.

Since information technology, which is not used, cannot be effective, it is important to understand how individuals decide whether they will use it. Therefore, the continued need to better understand **IS** acceptance and utilization motivates this research project. Especially this study may have two different focuses on the development and rational utilization of Executive Information System (**EIS**):

1. Understanding what happen preceding the use of a **EIS** (addressing questions such as why are executives investing in **EIS**, what makes it

successful, which are the more used features, how to develop a successful EIS;

2. Understanding what happen after the use of an EIS, what are the impact of its use on mangers or organizations

Most previous research concentrated in the first category, for example (Bergeron. F., & Raymond L., 1991), (Bergeron. F., and Raymond L., 1992) investigated the factors influencing EIS utilization. (Vandenbosch and Higgings., 1992) studied why executives choose or choose not to use EIS to augment or replace more traditional channels of information. (Watson et al., 1991) and (O’Shea., 1989) studied the development of EIS.

Very few researchers focused on the impact of EIS on the impact on executives or Organizations. (Houdesel and Watson, El Sherif and El Sawy., 1988), (Cottrel and Rapley., 1991) described particular experiences with EIS’s. (Moad., 1988), (Garelick., 1987), Coffey.,1988), (Giordanella.,1988) described different features of EIS and the possible consequences of their utilization based on subjective evidence. (Rockart & Delong., 1988) illustrated the impact of EIS on activities such as planning control.

3 Methodology

The information required to perform the study is gathered from senior executives through the administering of a self-completion questionnaire. The survey study investigated 100 largest, which are classified as the top Saudi Companies. Respondents of the survey were EIS users, and the survey concentrated on situational characteristics and the measurement of variables such as computer familiarity, participation involvement, attitude, and usage satisfaction. The respondents were requested to evaluate the EIS and the requirements needed for an efficient outcome (contribution in the development and implementation, training to all concerned users...etc).

4 Sample characteristics

The survey is conducted in the Times 'Top 100' companies. All reference to these companies is extracted from <http://www.arabnews.com/supplements/top100/Top1002004.htm>). Table 1 shows the response rate for the survey. The initial posting results in **13** completed questionnaires being returned - a response rate of **13%**. With 2 follow-up reminders this is increased to a total of **33** completed questionnaires - a final response rate of **33%**.

Table 1. The response rate of the survey

	Initial Response	Response to 1st Reminder	Response to 2nd Reminder
Number of Questionnaires Returned	13	4	16
Expressed as % of Total Questionnaires	13%	4%	16%

As table 1 shows, the first reminder only produces a further 4 completed questionnaires. For this reason, a second reminder was important, to provide considerable result statistically.

Table 2 Number and rate of companies concerned by the survey.

	Initial Response	Response to 1st Reminder	Response to 2nd Reminder	Final Total	Expressed as % of Survey Total*
Organizations Reject their Contributions	00	2	3	5	5 %
Organizations Taking part	13	4	16	33	33%
Non-Respondents	87	-81	-62	62	62%
Total	100			100	

Table 2 shows an analysis of the organizations that are included in the main study. Total of 33 companies, i.e. about 33% take part in the study. A further 5 companies refusing to contribute in the study; the remaining 65 companies never respond, despite 2 reminders being sent.

Having ascertained and achieved an acceptable response rate for the survey (i.e. that the total response is representative that all activities are represented and the number of companies participating in the study is sufficient to permit the development and subsequent testing All of the Top 100 companies are represented in this study; this is found in table 3.

Table 3. Type of activities involved by the study

Types	No	Initial response %	Response to 1st Reminder %	Response to 2nd Reminder %	Final Total	Final %
Industrial	31	12.9	11.11	16.7	14	40.68
Diversified	35	8.57	0	6.25	5	14.29
Banking	9	22.22	14.29	16.67	4	44.44
Contracting	4	0	0	50	2	36.36
Service	11	0	0	36.36	4	25
Agricultural	4	25	0	0	1	50
Trading	6	50	25.4	0	3	50

All the 33 companies are using EIS with an average life of **4 years**. Use of the EIS was stated between 0 to 40 hours per week with a mean time of 12 hours per week. 97% of user respondents are using EIS in all Business functions area; only 3% are concentrating the use of it in Human resources function. At the personal response level, the Major of the respondents are: 58% Business, 21.3% Computing, 21.2% Engineering. 78% of all respondents confirm that the surrounding environment impose the use of the computer, and the rest which 21.2% is a personal choice.

5 Statistical Analysis

Data analysis is performed using SPSS 12.0 for Windows. Because of the small size of sample the two main statistical tools used were Pearson Moment Correlation (PPM) and path analyses with .05 as the level of statistical significance. PPM was applied to test the correlation between the three measures of the implementation success within a value of satisfaction of the system, *the impact on personal job performance, and*

the impact on personal motivation, the influence of the EIS on management decisions, and five predictor variables (Users **level of education with their Major, Computer skills, Users involvement in the development, Users involvement in the implementation** and **the relevance of the training before the usage of the** EIS). Path analyses were carried out to consider the weight of predictor variables on the success of EIS directly and directly, and to ascertain which variables were the most significant in explaining the success of EIS.

Results of the Analysis

In the analysis, the means, the standard deviations and range of responses for the variables were the basis of the study. The mean system life of all EIS considered is 6 years. The mean time spent using the EIS is 7 hours per week (the use was reported to be zero to forty hours per week. Participant score of EIS implementation success generated similar results across all three criterion variables used in this research with a mean score of 4.3333 on Impact of Existing System on Personal Job Performance, 4.9394 on Impact of Existing System on Personal Motivation, and 4.3030 Efficiency of Decision Making after the Existing System. These measurements indicate a positive appreciation with the EIS provided in their companies

The predictor variables considered are between 3.6061 and 4.7576 (Education Level, 4.5455; Computer skills 4.7576; Personal Involvement in System Development 4.57558; Personal Involvement in System Implementation 4.7576; Relevance of Training before the System Usage 3.6061.

To relate between the three variables of user satisfaction with the EIS success in their companies, Pearson Products-moment Correlation analysis was used, is represented in table A.

Table A. The PPM correlation of the Variables and the EIS implementation success & satisfaction

	(1)	(2)	(3)	(4)
Value of Satisfaction of EIS	1	0.64	0.69(**)	0.66(**)
Impact of Existing System on Personal Job Performance		1	0.34	0.48(**)
Impact of Existing System on Personal Motivation			1	0.47(**)
Efficiency of Decision Making After the Existing System				1

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

The results of Pearson Product Moment Correlation (PPM) from Table B presents that the five-predictor variables (Education Level, Computer skills, Personal Involvement in System Development, Personal Involvement in System Implementation, Relevance of Training before the System Usage) are significantly related to all four decisive factors. However a computer skills is not positively related to of the two criterion

variables (*Satisfaction Level of Existing System, Impact of Existing System on Personal Motivation*).

Table B. The PPM correlation between the five-predictor variables with four criteria of EIS

	Satisfaction Level of Existing System	Impact of Existing System on Personal Job Performance	Impact of Existing System on Personal Motivation	Efficiency of Decision Making After the Existing System
Education Level	-0.691	0.765	0.165	0.237
Computer skills	0.10	-0.185	0.98	-0.11
Personal Involvement in System Implementation	0.404 (*)	0.496	0.416(*)	0.558 (**)
Personal Involvement in System Development	0.644 (*)	0.423	0.558 (**)	0.554 (**)
Relevance of the Training before the System Usage	0.651(*)	0.506	0.631	0.834(*)

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

The results from multiple regressions represent the power of the five-predictor variables in explaining variance of EIS success. Thus ($R^2 = 0.667$, $p < 0.001$) is significant. Therefore, the Regression index shows that EIS implementation success & satisfaction is predicted by five predictors variables. Education level and personnel Involvement in development directly influence the perception of the of EIS implementation success ($\beta = 0.57$; $\beta = 0.445$ respectively), 57.5% of the respondents are graduating from Universities with Business Major, 21.3% Computing, and 21.1% Engineering) Thus the result indicates that the EIS is based on Business Skills rather than other abilities, and more involvement in the developments leads to the high satisfaction by the users. Involvement in system implementation & the relevance of training have an effect on the success of the EIS ($\beta = 0.375$; $\beta = 0.305$ respectively). Computer skills significance is very low comparing to previous predictor variables ($\beta = 0.317$).

The results from the table B indicate that Educational level, the relevance of the training, and the involvement in the development of the EIS system are highly related to the satisfaction and the success of the EIS.

Conclusions

Important findings from this research are summarized are presented as follows:

1. Education level and User Involvement in the development directly have an impact on the success of the EIS.
2. Because the majority of the respondents are from Business Major may lead to the conclusion that even EIS is computerized system need Business skills rather than computer skills.
3. The degree to which the stakeholders perceive they are able to perform a job is positively related to the degree to which the stakeholders' need were delivered during the development of the computer system
4. The involvement in the development determines the need of the user that may direct to full satisfaction and a success of the system.

5. The training received prior to a system going live is positively related to the level of usage of the delivered system
6. The relevance of training is related also to the familiarity of the user to the system, which may lead to a better use of it.
7. User computer skills do not directly induce to a better success of the EIS.

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