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USER ATTITUDES
MAIN REASON WHY INFORMATION SYSTEMS FAIL

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ABSTRACT

Some factors which may influence the attitude of the user toward a computerized system are investigated in this article. The research was done in South Africa involving the users of computer-based systems in two organizations. Other factors, not directly related to user attitude are also considered and a number of hypotheses, which have been stated, are tested with empirical data.

Factors such as the perceived utility of a computerized system, the convenience of access to the computerized system, the quality of documentation, the accuracy and timeliness of information and the involvement of the user in computerizing projects, receive attention in this study. A large number of factors appear to be very important for the successful operation of a computer-based management information system and the results of the research project should offer a better understanding of the variables which can be associated with the attitude of the users and the success of a computerized system.
Keywords: Success, user attitudes, MIS

1. INTRODUCTION

A number of researchers have in the past drawn conclusions from research into the sphere of the management information system. In this regard the following are noteworthy:

Lucas [4, 6, 7] has shown a weak relationship between the economic performance of sales personnel and their information system utilization. Swanson [12] empirically found a high correlation in a query environment between the user's " appreciation" of the information system and the utilization of its outputs. The author [1] found in a previous research project that certain factors e.g. the attitude of managers towards computerization, the technical quality of computer personnel, the availability of resources. etc., have a direct in fluence on the success of a computerized system.

While in the past, various methods have been employed to measure user satisfaction with a computer-based information system, not much attention has been given to the measuring instrument itself. However, because user satisfaction is an acknowledged criterion which has been widely used in research projects, Bailey and Pearson [2] have devel oped a measuring instrument and pilot tested it to demonstrate valid ity and reliability. This instrument can be used to measure user satisfaction with various aspects of an information system.

In this research project, subsets of this measuring instrument, in the form of a questionnaire were used to collect data from clerical users as well as higher and middle level managers form two large organi zations in South Africa.

2. COLLECTING OF DATA

Two separate questionnaires were designed from the instrument of Bailey and Pearson for data collection. In this project data was collected from a random sample of 238 clerical users and the full population of 130 managers. These managers represent senior and middle level managers in the organizations.

Where Bailey and Pearson's questionnaire contains 39 variables, a subset of 16 variables was included in the clerical users question naire and a subset of 24 in the managers questionnaire for the purpose of this study. These questions were chosen because they directly related to the hypotheses to be tested in this project. All the questions could be answered on a 7-point scale. For the setting of the questions see [2] p.544.

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3. VARIABLES USED IN THE STUDY

Table 1 contains the variables which were used in the study for the clerical users and the managers respectively. For the multiple linear regression analysis of the data the variables SUC for the clerical users and SUCS for the managers were used as dependent variables. All other variables were used as independent variables.

	Factors	Clerical Users	Managers
1.	Accuracy of output information	ACCUR	ACCURM
2.	Timeliness of output information	TIME	TIMEM
3.	Format of output information	FORMAT	FORMATM
4.	Relevancy of output information	RELEV	RELEVM
5.	Convenience with which errors can be recovered		ERROR
6.	Perceived utility of output information	UTIL	UTILM
7.	Completeness of output information	VOL	VOLM
8.	Users documentation	DOC	DOCM
9.	Support from higher level management	MAN	MANM
10.	Convenience with which data can be prepared	ACCESS1	
11.	Means of input	ACCESS2	
12.	Participation in computerization projects	PART1	INVOL1
13.	Time spent in participation	PART2	INVOL2
14.	Satisfaction with output	SUC	SUCS
15.	Attitude towards computerization	ATT	ATTM
16.	Organizational competition with EDP		ORGCOM
17.	Relationship with EDP personnel		EDP
18.	Communication with EDP personnel		COM
19.	Technical quality of EDP personnel		TECH
20.	Schedule of services		SCED
21.	Time required for new developments		TIME
22.	Means of output from EDP center		OUTPUT
23.	Confidence in information system		CONF
24.	Training received	TRAIN	TRAINM
25.	Integration of systems		INTEGR
26.	Attitude of EDP personnel		ATTIT
27.	Information used for decision making		SUCSM

table 1

Variables

4. HYPOTHESIS

Ten hypotheses were formulated and the empirical data used to test the validity thereof. The following hypotheses are stated:

1. *The attitude of the user toward computerization is related to the convenience of access to the computerized system*

   If the access procedures to the computerized information system are of such a nature that they involve lengthy procedures and effort from the user, a negative influence on the attitude of the user can be expected. This applies especially in cases where the input forms are designed in such a way that they are very dif ficult for the user to complete. The same arguments apply to management if, for example, a manager cannot make an enquiry with ease, he will definitely be discouraged from using the information system.

2. *The attitude of the user is related to the support of higher level management*

   It is expected that support from higher level management will directly influence the

attitude of the user towards computeri zation and thus indirectly the success of the information system as well. If higher level management actively utilize and support the information system and also encourage subordinates (e.i. middle- and lower level management) to use the system, it could lead to a more positive attitude towards computerization — not only with regard to managers but also in the case of lower level clerical users of the system.

3. *The perceived utility of a computerized system is related to the accuracy of information received by the user*

The usefulness of information supplied to an ordinary clerical user as well as to management, is of utmost importance to make an information system succeed. In the event of inaccurate information supplied to a user, he loses his confidence in the system and may be so frustrated that he could deliberately attempt to make the system fail.

A manager would not make use of the information system in his decision making process if the information supplied to him was not absolutely accurate.

4. *The attitude of the user is related to the quality of user documentation available about the information system*

In this study it is expected that the quality of the available documentation about the information system — if it exists — would have a direct influence on the attitude of the user towards computerization. Proper documentation about any computerized system today is certainly one of the most important but also one of the most neglected aspects of systems in organizations.

Inadequate or no documentation makes it difficult for the user to thoroughly understand the part of the system he is concerned with and can lead to frustrations which may initiate a negative attitude towards the system.

5. *The involvement of the user in computerization projects is related to the relevancy of information he receives*

It is expected that users who were involved in computerization projects in their departments, received more relevant information than users who were not involved. User involvement in the design and development of computerized systems is of utmost importance for the success of such systems. Researchers have often in the past propagated user involvement as a manner of improving the quality of the information system as well as the satisfaction of the user with the system. (Lucas [6], Trist [13], Galbraith [4]). If a user is actively involved in the development of such a system, the feeling of " his own system" is created in him. Lucas [6] suggests the following in this regard: 'Creative systems design emphasizes the role of the user in designing the systems; we shall suggest that the user should actually design the system himself".

6. *The perceived utility of the computerized system is related to the format in which the information is delivered to him*

Disorganized outputs can lead to frustrations for the ordinary clerical user. If he has to continually look for the specific information he requires on a printout, the benefits or utility of the system will not appear to materialize in his mind. The same applies to a manager. If the information he receives is in such a format that he cannot immediately obtain the information he requires, the information system will appear to be useless to him and he would not employ it in his decision-making process.

7. *The completeness of output information supplied to the user is related to the convenience with which errors could be rectified*

This hypothesis applies to the transaction orientated user who works with in- and output of the computer daily. If output information is incomplete, in other words, certain information not included, it can hamper the rectification of errors to a great extent. An example of this is a system which does not entirely indicate the transactions which were not accepted, together with the reason for their rejection.

8. *The completeness of output information is related to the benefit of this information*

A clerical user would regard output information which is complete and which eases his daily task, to be of great value. A manager has another concept of completeness. Information containing too much detail is not of much use to the manager who has to use it to assist him in decision-making. Completeness of information to the manager, means information which consists of exactly the right amount of information. In such a case, the information would also be of use to the manager.

9. *The timeliness of output information is related to the way of access to the information system*

In a batch processing environment we can expect a possible delay in information due to procedures involving people who have to handle and deliver the information to the correct destination. Where online processing is concerned, information should be supplied more timely as a result of the human factor being eliminated to a large extent.

10. *The degree of training received by the users with regard to the computerized system is related to their attitude towards computerization*

It is expected in this study that individuals who received proper training regarding the system they used, would have a more positive attitude than users who received no training at all.

5. PROCESSING OF DATA

5.1 Correlations

In order to test the above hypothesis the BMDP[9] statistical computer programs were used. The hypotheses, as mentioned in the previous paragraph, were tested through correlations by establishing whether a relationship exists between certain variables. If $\rho = 0$ for the managers population, and r(corr.coeff.)>F, where F is the critical value when an inference is done on ρ for the sample of users, a linear relation between the individual variables definitely exist. The correlation coefficients between different variables in the users questionnaire as well as in the managers questionnaire, were calculated. Table 2 contains the correlation coefficients for the variables which apply to the ten hypothesis.

HYPOTHESIS	MANAGERS variables	corr. coeff.	USERS variables	corr. coeff.
1 :	UTILM:ACCURM	,216	UTIL:ACCUR	,487#
2 :	ATTM:OUTPUT	,134	ATT:ACCESS1	,379#
3 :	ATTM:MANM	,195	ATT:MAN	,351#
4 :	ATTM:DOCM	,396	ATT:DOC	,533#5 :
5 :	INVOLI:RELEV	,197	PARTI:RELEVM	,257#
	INVOL2:RELEV	,231	PART2:RELEVM	,152*
6:	UTILM:FORMATM	,119	UTIL:FORMAT	,408#
7 :	VOL:ERROR	,391#		
8 :	VOLM:UTILM	,341	VOL:UTIL	,358#
9 :	OUTPUT:TIMEM	,636	ACCESS1:TIME	,156*
	ACCESS2:TIME	,335#		
10 :	TRAINM:ATTM	,368	TRAIN:ATT	,065

*Significant on the 5% level
#Significant on the 1% level

table 2

Pearson's Correlation Coefficients

For the first hypothesis the correlation coefficient between the variables UTILM (perceived utility of the information system from the managers point of view) and ACCURM (the accuracy

of the information received by the managers) was found to be ,216 while the correlation coefficient for the same variables for the clerical users (UTIL and ACCUR) is ,487 which is significant on the 1% level. The coefficients indicate a strong relationship between the two variables used to test the validity of hypothesis 1. The same was done for all other hypothesis and the results summarized in Table 2.

5.2 Multiple Linear Regression

In the further analysis of the data, stepwise multiple linear regression (BMDP2R) and all-possible-subsets multiple linear regression (BMDP9R) were employed. The data of the managers and of the clerical users were analysed separately.

The first step in this analysis was an attempt to explain the success of the information systems by means of an appropriate subset of variables. In the case of the managers, the success was measured by means of the dependent variable SUCS (satisfaction with output information) whereas SUC was used as dependent variable in the case of the clerical users. (Therefore again in this case, satisfaction with the output information). The reason why this variable was chosen as the dependent variable is due to the fact that the output is really what the user has to deal with in his or her daily operations. To him it is probably the most important part of the information system.

By using the all-possible-subsets-approach to multiple regression analysis by means of the BMDP9R-program, it was relatively simple to investigate all possible subsets of different sizes and consequently finding the subset which explained the variation in the dependent variables the best. The criterion used in this case, was the part of the total variance of the dependent variable as a result of a linear combination of a given set of variables, also known as the squared multiple correlation coefficient(R^2). Considering the fact that a number of variables in the set resulted in an increased tendency in R^2, the adjusted R^2(Ra^2) which takes this phenomenon into account, was more appropriate.

The subsets which maximized Ra^2 in both the managers and users data were eventually selected as the best in their explanation of the dependent variables.

Table 3 illustrates the subset for the dependent variable SUCS which was used as criterion for success in the case of the managers, as well as the subset of independent variables which most effectively explained the dependent variable SUC in the case of users. The Ra^2 values and the relative contribution made by each variable toward the total variance of the dependent variables are also contained in the table. These contributions to Ra^2 by each variable are equal to the amount Ra^2 will decrease when the specific variable is omitted from the subset.

6. DISCUSSION OF THE RESULTS

From Table 2 it is clearly evident that the data strongly supports all of the ten hypothesis. The relationships which exist between the variables, as stated in the hypothesis, are significant to any organization experiencing difficulty with its information system.

MANAGERS		**USERS**	
variable	**contr.**	**variable**	**contr.**
RELEVM	,089	TIME	,046
VOLM	,031	ACCUR	,006
TIMEM	,005	RELEV	,043
INVOLl	,012	UTIL	,006
DOCM	,047	DOC	,006
ATIM	,018	ACCESS2	,020
COM	,010	PARTl	,005
TECH	,017	PART2	,005
TRAINM	,012		
Ra^2 = ,53		*Ra^2 = ,49*	
Dep.var. = SUCS		*Dep.var. = SUC*	

table 3

Variables which Explain Success the Best

In Table 3 we again find the importance of the relevancy of information as well as the timeliness thereof. Documentation about the information system also appears to be very important together with the involvement of the managers and users in computerization projects. All these factors are evident in both subsets of independent variables.

In the case of the managers, the volume of output information they receive seemed important while communication with the EDP-personnel and their technical quality are also evident as independent variables. The attitude of management towards computerization and the degree of training supplied to users appear to be of further importance.

In the case of the clerical users, the accuracy and the benefit of the information they receive and the way access to the information system is obtained seemed to be very important factors.

7. CONCLUSIONS

In this research project it was found that the attitude of the user might be one of the primary reasons why computer-based information systems fail. This attitude could be influenced by a number of factors as indicated by the hypotheses e.g. the convenience of access to the system, support of higher level management, the quality of user documentation, the degree of training received by the users, etc.

Another important finding seemed to be the fact that the timeliness and accuracy of the information are respectively related to the perceived utility of the computerized system and the convenience with which errors could be rectified. This of course could have a great affect on the attitude of the user.

In past studies, [1,5] it was concluded that some of the factors named above are partly responsible for the failure of an information system. However, in this research project it seemed that the attitude of the user could be the primary reason for failure and this attitude is influenced by a number of other factors. Thus, if enough attention is given to the factors appearing in the hypothesis, a more positive attitude might be the result with a greater chance of success.

The correlations which exist between certain variables and which are supported by the data of the two companies studied, are strong enough to be seriously considered when the quality of an organization's information system is investigated or when the implementation of new applications have to be considered.

When computer-based management information systems fail, it is often accepted that this is due to technical factors. From this research, however, it is very clearly evident that other important factors exist which influence the success of computer-based management information systems.

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