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A MODEL TO EVALUATE THE SUCCESS OF INFORMATION CENTRES IN ORGANIZATIONS

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ABSTRACT

The objective of this research report was to investigate some South African organizations who have been operating information centres (IC's) successfully for more than two years. As the success of the IC is strongly reflected in the views of IC users it was felt important to establish those factors rated most important by the IC users. This was achieved with a survey amongst the IC users of ten selected companies. A questionnaire was developed by making use of previous research work done by Baillie & Pearson (1983). Bruwer 1983a,1983b,1984, Rockart & Flannary 1983 and Alloway 1980. Eighty four IC users in the ten companies completed the questionnaire which in turn contained 63 questions. By means of regression methods fifteen factors could be identified which explained 69% of the variation of the success factor.

1. INTRODUCTION

The information centre (IC) originally conceived by International Business Machines (IBM) Canada in 1976 as a means to alleviate the then already critical data processing backlog (Computerworld, 1985) can today be found in many organizations world wide as a very important facility for end user computing. A 1985 survey by Growth Computer Coursewares found that of the more than 1000 companies who responded to their inquiries, half were Fortune 500 companies, 25% were Fortune 1000 companies and 25% were other large organizations not normally classified by Fortune such as aerospace firms and government agencies.

2. WHAT IS AN INFORMATION CENTRE (IC)

It can be said that the IC is the means that will bridge the gap between the traditional DP era, and the new era of true end user computing, where end users will eventually become totally self sufficient. Hammond (1982) states that through the implementation of an IC users and DP must make certain commitments. DP commits to provide proper education, support, the tools, the data in the required form and convenient access to the system. The users must make a commitment to adhere to the various policies and standards including the provision of skills to define and obtain the necessary data.

It is expected that the year 1994 will see the demise of the present day IC as a result of end-user sophistication and the flow of computer-literate graduates in all professions as a primary factor leading to this change (Computer Week, 1985).

3. OBJECTIVES OF THE IC

The overall objective of the IC is to support users active in the end-user computing field in such a manner as to make them self sufficient. This statement by the authors is supported by IBM (1982:1) who list the following objectives:

- Help both end users and DP to increase their productivity.
- Assist users in scheduling the right approach and products for their application.
- Provide personalised education.
- Arrange access to authorized data.
- Provide and maintain security procedures.

- Liaise with central DP on behalf of the end users.
- Assist users in planning and justifying the use of resources.
- Provide technical and administrative support.
- Investigate new end user application areas and future services.
- Promote IC facilities to user management and end users.

4. BENEFITS OF THE INFORMATION CENTRE

IBM (1982:1) points out that the benefits of the IC are likely to be evident in three areas of the organization.

1. Benefits for executive management:

- Improved responsiveness to business changes.
- High productivity in end user departments.
- Improved decision support and alternative calculations.
- More planning alternatives.

2. Benefits for the central DP department:

- Reduction of the backlog and maintenance load.
- Daily priority interruptions are minimized.
- Centralized control of personal computing.
- Improved DP credibility.

3. Benefits for the end user:

- Access to company data when it is required.
- Improved responsiveness to business needs.
- Increased productivity.

5. THE RESEARCH PROBLEM

Because of the factors mentioned above and the potential advantages of establishing an IC many companies introduced IC's in a great haste without the necessary preparation and planning. This can be related to a great number of failures and users to loose even more faith in DP. The study is primarily intended to investigate the important role of IC's and to develop a model for successful implementation.

Rockart and Flannary (1983), believe that user developed and operated computing will take over and be responsible for 75% of the use of computer resources within the organization by the year 1990. In Computer World (1985) it was reported that the dramatic increase in the number of IC's has been fueled by the compelling benefits of end-user computing.

Further, according to a computer Intelligence Corp. Survey, Fortune 500 companies now average 3,2 IC's each. Thus if the IC is to be the "transitional tool" from the traditional DP environment to a true end user computing environment it must warrant a great deal of management attention to ensure the success of the business in the future. Failing to pay attention to this important concept could cause the demise of the organization.

6. DEVELOPMENT OF THE QUESTIONNAIRE

From previous research work done by Bailey and Pearson (1983), amongst others, a questionnaire was developed. This questionnaire contained 63 questions which has to be answered on a 7-point scale. 62 Of the questions are aspects which may influence the success of the IC from the user point of view. One of the questions was a rating of the overall success of the IC as perceived by the user.

The questionnaires were distributed amongst end users of the IC in ten large companies in South Africa. A total of 84 completed questionnaires were returned representing a response of

70%. A few examples of the aspects are given below.

1. Ability to link data from different application databases.
2. IC implementation must be started with a pilot system.
3. IC services must be expanded in an evolutionary manner rather than provided all at once.
4. The personal choice that IC users have over the IC services they receive.
5. Degree of independence from DP for ad hoc information requirements.
6. IC service agreement (specified user and IC responsibilities)
7. CPU time available to IC users.
8. Suitability of the IC for ad hoc management enquiries.
9. Degree that the IC is operated independently from DP.
10. IC "walk-in" centres for infrequent users.
11. Top management commitment to the IC.
12. Documentation provided to IC users.
13. Attitude of IC personnel towards IC users.
14. Users understanding of the system etc.

6. PROCESSING OF THE DATA

The main objective in the processing of the data was to determine the most important factors influencing the success of the IC. Two BMDP computer programs (Dixon & Brown,1981) were used for the calculations. First a stepwise linear regression program was used with the success factor as dependent variable and all other 62 factors as independent variables. The best subset that emerged from this program was a subset of 22 variables contributing 71% to the variation of the success variable.

Next the 22 variables were used as independent variables in an all- possible-subsets multiple linear regression program and the success variable as dependent variable. With this procedure it was possible to identify a subset of 15 aspects which accounted for 69% of the variation of the success variable. Table 2 shows the results while the meaning of the variables in this subset are given in Table 3.

Adjusted r-squared	Variable	Coefficient	T-statistic
.693	x(8)	.108	2.26
	x(9)	-.16	-3.03
	x(17)	-.21	-2.90
	x(26)	.18	2.63
	x(27)	.25	5.10
	x(28)	.19	3.38
	x(29)	.24	4.01
	x(31)	.09	1.72
	x(43)	.29	4.10
	x(45)	.14	2.10
	x(46)	-.57	-5.63
	x(48)	.37	5.36
	x(52)	.13	1.72
	x(53)	-.24	-3.78
	x(63)	-.22	-4.03

table 2

Subset with 15 Variables

Variable Meaning

Variable	Meaning
x(8)	IC implementation should be started with a pilot system
x(9)	IC services must be expanded in an evolutionary manner rather than be provided all at once
x(17)	IC service agreement (specified user and IC responsibilities)
x(26)	Suitability of the IC for ad hoc management enquiries
x(27)	Document composition facility on the IC
x(28)	Number of IC consultants available to assist with user queries
x(29)	Degree that the IC is operated independently from DP
x(31)	IC "walk-in" centres for infrequent users
x(43)	Accuracy of output information
x(45)	Access to terminals by IC users
x(46)	Lead-time for new IC services
x(48)	User's feeling of participation
x(52)	Currency (up-to-dateness) of output information
x(53)	Top management commitment to the IC
x(63)	Financial modelling facilities provided

table 3

Meaning of the Variables

8. DISCUSSION OF THE RESULTS

The results of the field research are discussed in this section and an attempt is made to explain as to why they are rated as important. The presentation will cover the 15 most critical factors that should receive strong consideration when establishing an IC as identified by the field research.

8.1 IC implementation should be started with a pilot system

This question is very similar to question 9, viz "IC services must be expanded in an evolutionary manner rather than be provided all at once".

The advantages of an initial pilot IC are that users with the biggest need for computer services can be selected. Further, the first software package installed on trial or purchased can be selected with the particular pilot user in mind.

The disadvantages of not starting off with a properly planned pilot IC are that no clear objectives can be set and met. Further with too many different IC users during the initial implementation stage and too many software packages, sufficient attention can not be given to individual needs as the IC staff themselves are still in a learning phase.

In conclusion it can be mentioned that from the literature consulted all authors felt that the IC pilot scheme is a very strong prerequisite before entering the mature phase to ensure success.

8.2 IC services must be expanded in an evolutionary manner rather than be provided all at once

The meaning of this question is that rather than to provide all the IC services that the organization may require at the time of initial implementation, services should be gradually expanded. This will provide an opportunity for both users and IC personnel to get familiar with the IC environment and further, once experience has been gained better choices can be made for future products.

A big advantage of introducing the IC in an evolutionary fashion is that it is easier to manage a small department especially when it's a new environment than a large department. Also the changes of the IC failing is much greater the greater the initial responsibilities of the IC staff and also more costly.

In conclusion it is common practise to introduce ICs with an initial pilot system on a small base with selected users. In this manner staff and users can be trained and a full evaluation of the benefits offered by the IC to the particular organization done prior to proceeding to the mature phase.

8.3 IC service agreement

The meaning of this question is that a contract is entered into between the IC users on the one side and the IC on the other side. This contract specifies responsibilities of the IC staff as well as the responsibilities of IC users.

The advantages of a service agreement are that both parties know exactly their rights and obligations towards the other party. The agreement also serves as a guide for new users and introduce them to the IC environment in a quick and professional manner.

A big disadvantage if service agreements are not entered into is that user demands will constantly grow at the expense of the IC staff. The most demanding user will end up by using the largest proportion of the IC resources.

In conclusion it is felt that a mutually beneficial service agreement is a prerequisite to be entered into before any user is allowed access to IC facilities.

8.4 Suitability of the IC for ad hoc management enquiries

This means that the IC must not only cater for operational level enquiries but also be in a position to provide information for middle and top management's needs.

The advantages are numerous for the IC as such because not only will top management be provided with timely up to date information, but top management will also learn to appreciate the value of the IC.

Should the IC not be in a position to process management requests without undue delays, management may be inclined to believe that the IC is an expensive DP toy of no benefit to the organization.

In conclusion it must be borne in mind that management has allocated the necessary funds to set up the IC. It should therefore be an important consideration that their information needs enjoy a very high priority with the IC staff.

8.5 Document composition facility on the IC

This question, number 27, and question number 63, "Financial modelling facilities provided" will be treated as one as they both relate to IC user tools.

It is very important that the IC user tools provided be as suitable as can be obtained for the particular user's needs. It could be that more than one financial-package must be installed in order to satisfy these needs. Users of IC services should be given the opportunity to contribute to the selection of tools.

The advantages of suitable tools are that they are designed to meet most of a particular user's needs in a manner which is convenient to users with the least amount of programming/manipulation required by the user.

The disadvantage of an unsuitable tool is that it is particularly difficult and sometimes impossible to transform data into the form and presentation required.

In conclusion it should be noted that the amount of tools provided will be a matter of economics, but it should be left to users to economically justify special tools for their particular needs.

8.6 Number of IC consultants available to assist with user queries

It is important that when users experience the need to consult with a person about a particular problem that such a consultation should take place within a reasonable span of time. This can only be achieved if the number of consultants is very closely balanced with the user population and their educational level.

The advantages of sufficient consultants being available are that the user's problem can be resolved without an undue delay, particularly when financial transactions are involved, and the problem can be addressed as it arises while all the facts are still fresh in the users mind.

A disadvantage of too few consultants is that consultants specializing in other products must now try to help, or the user must continue with his efforts hoping that he will be able to resolve the problem. This has both time and demotivation implications.

In conclusion, the IC should be staffed with a sufficient number of trained consultants being readily available when their services are required.

8.7 Degree that the IC is operated independently from DP

Through the years of computer services users have become more and more dissatisfied with the traditional DP departments. This problem has its roots in the inherent difference between values and perceptions of users and DP professionals as was discussed in the literature study. The IC concept was engineered to give new computer services with total independance from the DP development. The fact that this factor was included by IC users could be seen as proof of the fact that users are dissatisfied with the traditional DP departments.

The advantage of operating the IC independently from the DP department is that decisions can be taken without reference to the main DP department resulting in a faster response to the user. Services can be tuned to the users' direct needs.

One major disadvantage is that with too much independence IC users can start developing large systems not intended for the IC. However, this could be controlled to a large extent by means of a suitable "standards" document that defines the boundaries of use with the tools provided.

8.8 IC "walk-in" centres for infrequent users

The meaning of this question is that infrequent users of IC services who cannot economically justify a dedicated terminal should have easy access to IC terminal equipment. This can be achieved by installing equipment in a convenient location for potential IC users. The location of such walk-in centres should be determined by means of a census.

The advantages of providing "walk-in" centres ate that infrequent users needs are catered for and at the same time it is a very convenient vehicle for introducing new users to the IC concept.

Should walk-in centres not be provided it could lead to potential IC users not being bothered to use the IC because of the inconvenience.

Although from the literature consulted "walk-in" centres did not enjoy a place of prominence it is, in the authors' opinion, a very good solution to extend the IC services on an economic basis. Users could for example book specific time slots.

8.9 Accuracy of output information

This statement could have one of two meanings in the IC environment. Firstly the output information could be incorrect as a result of old data and secondly as a result of incorrect computations due to bad programming.

The advantages of accurate output information is self evident. It prevents the possibility of a person acting on wrong information and it further eliminates the implications of having to repeat the computation.

It is important that the IC takes corrective action whenever cases of inaccurate output information are discovered in order to prevent the reoccurrence.

If the IC database is periodically refreshed then it must be ensured that the user is at all times informed of the "age" of the data at any time.

8.10 Access to terminals by IC users

This question compliments question 31, viz "IC "walk-in" centres for infrequent users". What this means is that all users should be in close proximity to a terminal that will provide them

access to the IC services of their choice.

The ideal situation will be that the IC user will have a terminal in close proximity to his/her desk in a similar way as telephones are available. This will have the advantage that the facility's utilization will be maximized. Then for infrequent users a terminal should be in close proximity to their offices.

Should terminals not be situated closely to IC users they will loose time moving between their office and the terminal. Because of the effort involved they may delay using the facility.

In conclusion it must be mentioned that without IC users no IC service can exist. Thus the users' requirements must be strongly reviewed when installing terminals.

8.11 Lead-time for new IC services

Lead-time for new IC services could mean that the user either require a new tool for special purposes or it could mean that additional data is required to be loaded onto the IC database from the live database.

The advantage of a short lead-time for IC services are that the user with a particular problem needs additional data or tools. Whatever his need may be, it must be provided within a time span that will be accepted as reasonable by the user and in time to provide the results when required.

The disadvantage of a long lead-time is that by the time the media for solving the user's problem has arrived his need may no longer exist. As a last resort he may have to take an intelligent guess because of the lack of information.

The IC should pay particular attention and be sensitive to users needs for additional services to prevent the traditional back-log problem, of DP fame, to also become a IC back-log problem.

8.12 User's feeling of participation

The user must have the feeling that as a result of his efforts an objective has successfully been reached. This will instill a sense of pride in users and the positive results obtained will assist future motivation.

Advantages of the user feeling that he is totally involved are that he feels responsible for the end result whether it may be satisfactory or not. Thus he cannot blame the IC should things go wrong. Further because the user is constantly involved the chances of a wrong end solution are greatly reduced.

A disadvantages of the user not being totally involved is that he may blame the IC for bad results which are also more likely under these circumstances.

In conclusion it can be mentioned that the IC should provide suitable tools, training, education and consulting services but programming must be done by the IC users themselves.

8.13 Currency of output data information

This question has relevance to the historical value of information. At operational level information must be as current as possible to represent the status as at that point in time. On the other hand top management is not concerned with the currency of information which could typically be one year old and still serve the purpose.

The currency of the output information will depend on each user's needs. It is therefore important that this aspect of the IC service be clarified during initial contact with the potential user. What this will involve is the frequency of updates applied to the IC database.

8.14 Top management commitment to the IC

This means that top management is fully committed to the IC concept, that they are prepared to invest a certain sum of money in the IC to reach a given objective in a given time frame.

The advantage of top management being committed to the IC concept is that by way of their positive attitude towards the IC and their demands for information placed on the IC services it will increase the IC's chances of success.

The disadvantage of top management not being involved is that it may be difficult to obtain

additional funds.

In conclusion it can be said that the greater top management's interest in the well being of their IC the greater the chances of success, because subordinates are inclined to follow the values of superiors.

9. CONCLUSIONS

The survey showed that management must be strongly committed to the IC concept and that the IC must in turn be responsible to management's needs. The user wants representation as to what tools he is provided with and should have easy access to terminals with the information being accurate and current. Packaged programs in strong demand are report writer, document composition and financial modelling facilities. A service agreement must be entered into serving as a permanent reference as to what either party may expect from the other. Users strongly prefer a short lead-time for new services with IC consultants readily available when needed. Initial implementation should be started with a pilot system and new services must be provided in a well planned evolutionary manner.

In conclusion it is believed that the objective as set out on in section 3 has been met. The model contains some very relevant factors of which most are strongly supported by contemporary writers on the IC as key issues. The factors involved have also been identified in the past as areas of concern in the traditional DP department. It is hoped that this report will shed some light on the causes of the high failure rate amongst new Information Centres and assist with the establishment of such centres.

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