IMPORTANCE OF PHASES DURING COMPUTERIZATION PROCESS: THE NBC CASE

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Abstract

Computerization process must obey the predefined phases:problem definition, feasibility study, system analysis, design, implementation and maintenance. During these phases, if the aspect of user involvement is ignored the resultant system becomes either unmanageable, unsatisfactory and unproductive, unreliable inefficient or a combination of all.

INTRODUCTION

In Tanzania where the computer industry is still in its infancy, the majority of existing computer systems have been implemented without first going through pre-design phases In those cases where predesign phases have been undertaken then the aspect of user involvement has not been emphasized.

Along the course of this article we shall try to demonstrate some of the deficiencies inherent in computerization processing in Tanzania and the reasons for their existence.

In order to come up with some evidence of problems facing computerized institutions and institutes a case study was conducted in the NBC . Two branches, one computerized and another non-computerized were taken for comparison. Only the Current Account section was chosen for analysis.

INITIAL COMPUTERIZATION IN TANZANIA

Initial utilization of computers in Tanzania started in 1965. Most institutions started by computerizing their finance departments.

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Among them are:

NAME OF INSTITUTION	*YEAR COMPUTERIZED*
Ministry of Finance	1965
Tanzania Electricity Supply Company	1968
National Provident Funds	1970
State Trading Corporation (STC)	1970
CRDB	1984
BOT	1990

The computerization process have not been accompanied by sufficient studies to show how effective computers has been utilized nor how could they be effectively used.

One study done by experts from International Labour Organization (ILO) in 1982 observed : "at first computers had bad reputations in the country and the effect was the phase-out of computers by National Provident Fund (NPF) and State Trading Corporation (STC) in 1974" . Also the Government of Tanzania banned acquisition of computer hardware in 1970. Unfortunately this report did not investigate the cause of this situation.

CASE STUDY: COMPUTERIZATION OF THE NBC

Introduction

Improvement of customer services, reduction of errors, reduction of operating costs such as overtime, and stationery expenses were the main objectives for computerization of the NBC[4]

Data Collection

i) Personal interview using a structured questionnaire was conducted on NBC officials and staff (computer operators) to determine the level of user involvement in the build-up of the system.

ii) Observation was conducted at bank counters among customers to determine the waiting time from when the customer requests for service until when he is served.

iii) Going through the register for inward letters to determine the number of complaints received by the branch and find proportion of complaints from current account department.

iv) Reading journals, internal papers at NBC Head office.

v) Interview was carried out with branch management to determine the level of complaints and queries for errors in the current account.

Data analysis

For analysis of data collected, the following models were used:

$$(i)\ Z = \frac{P_1 - P_2}{\sqrt{\frac{P_1 Q_1}{n_1} + \frac{P_2 Q_2}{n_2}}}$$

$$\approx (t_{n1} + t_{n2} - 2)$$

Where

P1 = proportion of errors/complaints in computerized branch.

P2 = proportion of errors/complaints in non computerized branch.

Q1 = 1-P1

Q2 = 1-P2

n1 = size of sample one

n2 = size of sample two.

With this model proportions on the number of errors/complaints for the branches were analyzed.

$$(ii)\ X\text{-square test} = \frac{\Sigma(O-E)^2}{E}$$

$$\approx X^2(r-1)(c-1)$$

Where

O = observed average waiting time per day
E = Expected average waiting time
r = Number of branches investigated (rows)
c = Categories of waiting time observed (columns)

With this model the average waiting time was determined.

$$Z = \frac{\overline{X_1} - \overline{X_2}}{\sqrt{\frac{S_1}{n_1} + \frac{S_2}{n_2}}} \approx (tn_1 + tn_2) - 2$$

Where by

X1 = average cost for computerized branch.
X2 = Average cost for non Computerized branch.
S = Standard deviation for samples.
n = Size of the sample.

With this model the behaviour for stationery cost was analyzed.

FINDINGS

i) Number of errors/complaints

Research findings showed that computerized branches have fewer errors and complaints when compared to non-computerized branches.

Test for proportions was carried out and the value calculated was -0.83 and fell within the acceptance region as the cut off point for acceptance at both 5% and 10% levels of significance was -2.58 and 1.29 respectively. The analysis validated the findings.

Findings of the research showed that there was no systematic way of receiving complaints/ queries at service point and hence not easy to determine type and number of complaints from customers.

Only those formal ones which are recorded in the Inward letters Register and sent to the respective departments for necessary actions are available.

From the register it is possible to get a number of complaints which have been recorded.

It was observed that at Samora Corporate branch 25% of all complaints recorded were against Current Account Department. At Bank House branch of all recorded errors 33% were about current account services.

The study revealed that most of complaints patterned to later delivery of statements and delay in providing services but most of these problems had been solved in the computerized branch.

ii) Waiting time

Chi-square test of independence was conducted to determine variations between 3 minutes and 125 minutes service time for computerized branches and non-computerized branches respectively. The Cut-off point for rejection was 9.49 at 5% level of significance while the value calculated from data collected was 51.5.

From these results it was established that customer waiting time is shorter in computerized branches than in non-computerized branches.

iii) Cost reduction

Test of difference of means was performed to find out whether operating costs are less in computerized branches than in non-computerized ones. The critical value was 1.321 at 10% level of significance and the calculated value was 1.65; hence falling outside acceptance region; signifying that computerization has not been able to reduce costs.

It was observed that paper spoilage, skipping of sheet during printing; printing of pre-list and final list and the price of computer stationery are contributory factors for higher operating costs.

The trend of overtime also gave negative results.
It was found that the number of hours spent after normal working hours, by average was 111.25 hours in computerized branch and 108.27 hours for non- computerized branch.

With these findings it is evident that computerization has not yet effectively trimmed down operating costs in the bank.

Findings of the research revealed that higher stationery cost could be due to the following reasons:

i) poor training on the use of computers.
ii) Spoilage of papers during printing due to poor timing printers.
iii) printing and re-printing whenever customer information is needed.
iv) Printing of prelist and final list by waste department for checking purposes.
v) High price of computer stationery.
vi lack of specification about which output should be through screen and which output should be through printer.

Beside the increase in stationery cost; findings revealed that even

after computerization Samora Branch staff stayed beyond normal working hours hence forcing the bank to incur overtime expenses.

During interview with branch management it was observed that some of the causes for overtime could be:-

i) Some staff were doing duties outside their job description at the expenses of the bank (poor job description by the bank).

ii) Need for more income on part of employees which prompts them to work slowly in order to create a need for overtime.

iii) Lack of targets, that is lack of Management by objective (MBO) . Except for tellers in computerized branch where by the manager could monitor and determine efficiency of each officer attached to a personal computer (PC) and hence measure performance with respect to others the rest of employees do not have any previously set target.

vi) Power interruptions. These have caused the unnecessary accumulation of jobs.

Stationery cost and overtime hours indicate an increase in operating costs for the period covered. With the introduction of computers it was expected that operating cost at Samora branch would have been lower than at Bank House due to the efficiency and effectiveness of computers.

On user involvement in the Analysis and Design phases, the study revealed that non of the NBC computer operator was involved in the exercise. It was learnt that all re-installation phases were done by vendor (ICL). It was further revealed that none of the system analysts of the NBC was involved in the project. The management of the branch was not involved in the project because both the management and operators were not aware of the importance of their participation in such activities.

CONCLUSIONS.

It is true that computerization has reduced customer waiting time and has enabled the NBC to introduce new services. But , on the other hand it shows that the cost for achieving this success is enormous. The cause for this can be found in the failure to involve users in the following phases:

The problem Definition Phase

It is this phase which defines problems to be solved and thus set the direction for the whole project. It also sets the project bounds, which define what parts of the system can be changed by the project and what parts are outside its control and the resources to be made available to the project. For its importance the problems (which sometimes are called projects terms of reference) are set by the organization's management (user).

Since this phase deals with the initial aspects of computerization process, if undertaken without thoroughly involving the user, then the resulting system is bound to lose direction and consequently fail.

The Feasibility Study Phases:

The feasibility study phases propose one or more conceptual solutions to the problem set for the project. The conceptual solutions gives an idea of what the new system will look like. They define what will be done on the computer and what will remain manual. They also indicate what input will be needed by the system and what outputs will be produced. These solutions must be proven feasible and a preferred solution will be accepted.

Therefore three aspects must be clear after feasibility study.

1. Technical:- does the organization have the technology and skill necessary to carry out the project, and if not, how should these be obtained?
2. Operational:- does the proposed solution satisfy user

requirements.

3. Economical:- are the project goals achievable within the resource limits allocated. Is it worthwhile to proceed with the project.

High running costs, and inefficiency in computer utilization are the results of failure to look into these aspects before the system installation. Without user involvement the results from this phase will definitely be unrealistic.

The System Analysis Phase.

System analysis phase- is a detailed appraisal of the existing system. This appraisal includes finding out in more details from the users (operators) what the system problems are and what are the requirements of any new system. problems like high running costs, missing functions, system unpopularity leading to actions like phasing out, etc. are the consequences of by-passing users during this phase.

REFERENCES

1. Aimed, A. A. — *Applications of Computer Techniques to Improve Management Performance. MA Project Report, University of Dar es Salaam; 1988.*

2. CATS (T) Ltd , — *ICL/NBC ME 29/DRS Systems Proposal, Dar es Salaam, 1983.*

3. Cecil, P.B. — *Office Automation Concepts and Application. The Benjamin Cummings Pub. Co. California, 1984.*

4. Coopers and Lybrand; — *National Bank of Commerce Review Final Report, DSM July 1991.*

5. Chikira , M.C. — *Customer Service Level as a Determinant of the Customer Patronage. MA Thesis, Institute of Development Management - Mzumbe 1990.*

6. Fallik, F. and Brown , B. — *Statistics for Behavioral Sciences The Dorsey Press Homewood, Illinois , 60430, 1985.*

7. Hawryzkiewycz, I. T. *Introduction to Systems Analysis and Design. Sydual 1991.*

8. Ira , I. G. and Wilson, E. M. *What Computer Can Not Do. Vertes Books, Princeton, NY London, 1970.*

9. Kitinya, S. C. N. *Computers in Business Application Teaching Manual, University of Dar es Salaam, 1986.*

10. Mahuvi, T. Y. *A Study of Some Queuing Problems at Dar es Salaam, 1975.*

11. Longworth, G. *Introducing SSADM; Manchester. 1992.*

12. Mniachi, A. R. C. *Application of Queuing Theory to NBC Savings Account Counter. MA Thesis, UDSM 1987.*

13. Mmbaga, H. E. S. *Customer Service Problem in the NBC . MA (Econ) Thesis, UDSM, 1989.*

14. Mclead; R. Jr. *Introduction to Information Systems a Problem Solving Approach Pergamon, Science Research Associates, Inc. A Maxwell. Pergamon Publishing Co. 1989.*

15. NBC *A Profile of the National Bank of Commerce, Business Development Department , 1991.*

16. Peters, L.J. *Software Design; Methods and Techniques, NY, 1987.*

17. Pitcher; D. *Computer view. Dat Systems Journal of Management Decisions (february , 1990).*

18. Sander H.D. *Computer Today. McGraw -Hill International Book Co. Auckland, 1983.*

19. Smythe C. *Small Business Systems. Dat Systems Journal of Management Decisions (May, 1984).*

20. Suzanne; Lewis, M.G.A and Sheya M.S. *Survey of Computers in Tanzania Dar es Salaam 1986.*

21. Taylor; D.R.F. and Abnudhor, R.A. *Computer and Africa Praeger Publishers . N. Y. 1977.*

22. Ukandi, G.D.; *Computers and Computer Applications in Developing*

Sonder, R.H. and Damachi, N.A. (Editors) *Countries. MacMillan Press, 1977.*