'Compte Rendu' of a Global Information System

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KEYWORDS

Information Systems, Data Bases, Data Processing, End-Users

ABSTRACT

In this paper we analyze two approaches to the problem of automating the information system of a building company; the first using a classical Data Processing (DP) department, the second a distrubuted end-user solution. The case under study relates to a real situation where the two solutions actually ran in parallel for nearly two years.

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MOTS-CLÉS

Système d'information, Base de donneés, traitement des donneés

SOMMAIRE

Nous présentons dans ce travail une étude comparée de deux solutions pour l'informatisation globals dans une entreprise de génie civil; la premiére en utilisant les services d'un Centre de Calcul classique, la seconde correspondant á une solution distribuée du type 'end-user'. Cette étude est le résultat de l'analyse d'une situation reéple ou les deux solutions ont été en place simultanément pendant presque deux ans.

1. INTRODUCTION

At the 1984 CIB we presented a paper under the title "Proposal for a Global Automatic System" (1). In brief our thesis was two fold; first we argued that the information handled within any company is part of a global entity and as such should fall into a sole basic model of computer data base for implementation purposes; this model should be able to register not only the basic information pertaining to the various departments of the company but also the mutual relations existing between the various areas of application. Secondly, we argued that in most cases the applications should be put in the hands of the end-users and run directly by them at their terminals; a DP department should not exist in its classical role, the need for computer specialists should be limited to situations of malfunction or consultancy.

Chance had it that our thesis could be tested throughout the last two years in a real situation, specifically in a big civil engineering firm (business USD 25 million/year, 2500 employees), where a classical DP solution had been in place for some years with lukewarm success. This provided us with a unique case-study opportunity where the two approaches could be compared in parallel. It is this comparison analysed in various aspects we are reporting here.

2. THE TWO SOLUTIONS

We should start by briefly outlining the two approaches under evaluation.

The solution already in place, later discarded, was based on a hiperclassical DP structure. It consisted of:

machine: one minicomputer with 1 Mbyte of memory, 800 Mbyte of disk capacity, six terminals for data collection and six terminals for the DP's own staff, Cobol as the tool for implementation.

methodology: the different areas of application were tackled independently, each with its own specific file design and ad-hoc programming. A `linear' development cycle was loosely followed with its phases of functional analysis, implementation design, programming implementation and test.

staff: one head of DP department, one analyst, three programmers, two operators and five persons doing data entry.

The alternative solution that actually ran in parallel for nearly two years consists of:

machine: one multiuser minicomputer with 2 Mbyte of memory, 120 Mbyte of disk space, a relational data base system, Fortran-77 for the specific programming needs, and fifteen gemeral purpose terminals, five of them located at different sites, connected by telephone.

methodology: the information needs of the company, pertaining to the various areas followed the same relational model and were implemented with the same data base tools. The relations between the departments were materialized as relations between the data bases. A minimum definition of the problems was sought, working together with the users, as a prototype to produce results very quickly. The specification evolved through a fast cycle of design - prototyping - results - correction of the design. The "final" solution was directly "driven" by the end-users, using a big set of common interactive tools and some specific utilities, none of which demanded any expertise in computer science.

staff: one senior analyst assisted the users in defining their needs and maintaining the development cycle evolving until a certain stability was reached. A second senior programmer was in charge of developing the specific needs of each application such as some data entry programs or traditionally or legally imposed outputs. Lots of users running the various applications at their terminals.

3. EVALUATION

The main points we would like to consider to compare the two solutions (2,3,4) are: real cost, effectiveness, user's acceptance and flexibility to accommodate new or previously ill understood specifications. Let us refer to the classical DP department solution as the "DP solution" and the alternative approach as the "end-user" solution.

The relations between costs, in an abstract currency, can be summarized in the following table:

	DP	End-user	Variation
Machine/cost	35000	15000	-57%
Machine/Maint p.year	3500	1500	-57%
staff p. year	16000	3600	-77%

The costs in machine and its maintenance was reduced nearly by half. The huge reduction of cost in staff + software, has also to be analysed keeping in mind the other comparison criteria: effectiveness. Effectiveness, we define it as the capacity to answer correctly the user's requests in acceptable timing (i.e., not too late). The ratio of the two solutions can then be easily of one to five. More precisely the DP solution developed, in two years, applications for accounting, salaries and equipment, whereas the "end-user solution" in one and a half years tackled accounting, personnel, equipment, costs, planning, production, as summarised in the table referring to two year development time.

	Account	Personnel	Equip.	Control and Produ.	Costs	Plann
DP	Y	1/2 Y	Y	-	-	-
End-user	Y	Y	Y	Y	Y	Y

In terms of user's acceptance a "DP solution" is normally faced "as is", asking for little involvement from the user's point of view except at the phase of functional analysis, when a definite, precise specification is extracted over the desktop. Afterwards they receive standard paper maps which they read or just pile up; besides, the DP department is "always" late whether that is a good or bad thing from the user's point of view.

Basically, the computer services are "foreign" in regard to the users, no inventiveness or involvement is usually demanded. The end-user solution raises different questions. There are those who do not accept it or never manage to sit at the terminal for reasons beyond the scope of this paper. Others adopt the direct "driving" of the applications with a useful capacity for inter-help, even between different departments, showing remarkable imagination in the use of the utilities at their disposal, sometimes being really demanding on the capacity and friendliness of those tools. In the case under study this later users survived in the company, the others left.

In regard to the sectors where the "DP solution" was providing some sort of answer the changes in staff can be summarized in the following table:

	Personnel	Accounting	Equip.	Control and Production	Total
DP	20	12	30	8	70
End-user	8	8	15	12	43

In this field of user acceptance we also found that the interested end-user, although impressed by overloaded blinking screens when demonstrations are performed, generally finds them too complicated, and except for highly routinized data entry, work feels more comfortable with menu driven or in general dialogue driven interfaces.

4. CONCLUSIONS

From the company's point of view the most obvious gain is, of course, in the costs involved and effectiveness of the solution. However, the impact is more profound. The staff is renewed or filtered; it is the more dynamic people who remain, accepting the direct responsability of the applications. As this happens the routine procedures normally come under a much sharper and more acute criticism; it is typical that these procedures are changed and made more effective. The absence of a DP, which can be just an "uncontrollable" link in implementing some areas of application, makes the dialogue management-department more agile and responsive.

In summary and facing the possible solutions for a civil engineering firm:

a) DP department
b) end-users having access to microcomputers loosely connected
c) end-users using terminals of a central machine

we believe the latter to provide the best balance between the desired situation of giving the responsibility of the applications to the end-users, but at the same time being able to have centralized views over all the information and keeping it related, under control and without unnecessary redundancy.

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Modular Co-ordination and the Design Process
A Review of the Documentary Bases

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KEYWORDS

Component building, dimensional/modular co-ordination, tolerances.

ABSTRACT

The publication in 1984 of Report No. 68 of CIB, The Principles of Modular Co-ordination in Building, followed a detailed review of the original Condensed Principles (CIB W24/IMG 1967) and provides a consensus statement of the concept up-dated and expanded in the light of recent research and experience of implementation.

From time to time, it had been suggested that Modular Co-ordination lacked a coherent system of tolerances and an effective approach to the question of joints and junctions.

This paper outlines the background to the development of a general approach to building fit and tolerances within both CIB and ISO and also illustrates how a methodology for joints and junctions is defined within the existing agreed conventions linking theory and practice consistently.

The paper will also show how there now exists in terms of present documentation from CIB and ISO the necessary and sufficient basis for effective co-ordination of building dimensions at both the theoretical level and at the level of techniques of application.