

- the case in the social housing sector where the inhabitants will become more and more involved to express their wishes;
- The role of the architect as an independent party is the most sensitive one for the expected organizational changes in the construction process;
 - The role of the general contractor will become greater in all situations of consensus. In this context it must be expected that specially the role of the side manager will become more important;
 - In all probable future situations the supplying firms will gain influence in the process of decision making;
 - In all consensus situations the regulating and controlling role of the government will be decreasing.

7. NEW THREATS AND OPPORTUNITIES

The future will bring new threats and new opportunities to all participants in the construction process. With a possible exception for the largest firms, most firms in the construction industry are not known to have their policy making being influenced by long-term planning. However, the results of this study indicate that this attitude may prove to be fatal. If the fundamental changes as indicated in this paper, will not be anticipated, the firms involved are threatened to loose further their share of the market. However, this threat will not only be limited to those individual firms. It will also have its effect sonner or later on all branch levels in the construction industry. Therefore the concerning branch institutions will have to take an initiative to realize an improvement in strategy. As has been shown in this study the need for an overall consensus is preponderant.

Design of a Data Base for Housing Performance Requirements

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KEYWORDS

Data Base Design, Housing User Requirements, Housing Data Structure, Housing Performance Requirements, Performance Attributes

SUMMARY

Objective of this study is to develop a data base (DB) to be used by architectural as well as construction firms while they are making decisions in the process of design and production phases of housing.

The stored data relate to the performance attributes of housing spaces. The attributes lead to performance requirements depending on legal documents from all over the world. This DB system consists of data files, application programs, user programs, guides and glossary. Data files of DB consist of three sequential file families. The first file is related to bibliographies of publications. The second file is prepared to contain building level, building subsystems and the number of persons in the dwelling. The third group of 15 files is allocated to the user requirements with reference to performance attributes.

The first group of program family contains application programs designed for various purposes such as editing, merging, sorting, multiplying and searching. The application programs are sometimes used only for one purpose but in general two or three of them are combined together to simplify user entries. The second group of program family is designed for users, as an aid for their requirements from the DB. There is also an alphabetical glossary of the DB and a manual prepared for users.

Développement des Données de Base pour les Besoins des Performances des Logements

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MOTS-CLES

Développement des Données de Base, Besoins des Usagers des Logements, Structure des Données en Logement, Besoins des Performances des Logement, Caractéristiques de Performance.

SOMMAIRE

Le but de cet article est de développer des données de base (DB) pour les architectes, aussi bien que pour les ingénieurs civils, lorsqu'ils projettent, et contractent des logements.

Nous entendons par données de base (DB) toute une série de collection de données interreliées pouvant être de caractère tout-à-fait général ou spécifique. Les données recueillies dans cet article visent la performance dans la dimensionnement des différentes sections d'un logis. Lors de la préparation de cet article nous avons utilisé les exigences officielles de performance des différents pays. Notre système de données de base concerne des "files" de données, des programmes d'application, des programmes pour les usagers, des guides et un petit glossaire. Les "files" de notre donnée de base sont constituées de trois familles de "files" en série. La première "file" est consacrée aux bibliographies des publications. La seconde "file" contient des références abrégées des niveaux des habitations, de leurs sous-systèmes et des nombres d'habitants des domiciles. Le troisième groupe de 15 "files" est assigné aux exigences des usagers, se référant surtout à leurs demandes de performance. Le premier groupe des programmes contient des programmes d'application pour différents buts, comme imprimerie, "merging", triage, "multiplying" "searching", etc.. Les programmes d'application sont quelquefois utilisés pour un seul but, mais en général deux ou trois programmes sont combinés pour faciliter l'entrée des usagers.

Le second groupe des familles de programmes est destiné aux usagers et a pour but de les aider dans leurs exigences des données de base. A la fin, nous avons aussi donné un petit glossaire alphabétique des données de base et un manuel pour les usagers.

INTRODUCTION

Architectural and construction professionals are getting better and better at handling very large quantities of data in a very precise way. In this study housing user requirements data related to housing standards are represented as a model of the legal housing information world. We can not expect it to represent the entire information world, it will represent only what we want to remember during the phases of design.

Housing legal documents have a population of user requirements data as a cumulative of individual performance attributes that correspond to various subjects. Data of this kind are collected from various institutions such as the Library of Congress, Department of Housing Urban Development etc.. In the organization, integration and control of the data for the use in different ways in multiple environments a data management system, FAMULUS, is utilized(1).

2. SIGNIFICANCE OF THE PROBLEM AND OBJECTIVES

Performance approach in design is firstly the practice of thinking and working in terms of ends rather than means. A designer or a contractor needs refined retrievable information which can be a data base of user performance requirements containing user needs and behavior in use evaluations of different performance attributes at all stages of design process. The formally accepted user requirements can be found in building codes and regulations of a country. As most of the building failures generate from the negligence of user requirements or ignorance about them, the alteration of that information into a form to be used by producers, contractors, as well as designers, becomes the most important thing to achieve.

The main objective of this study is to establish a computer data base system (DBS) for the housing (cross-cultural) user requirements as design constraints based on user performance requirements, to be used by construction firms and designers at various stages of designing and production.

The other objective of this study is to help government officials in the formulation of housing policy quality and quantity decisions through the provision of required cross-cultural data storage.

3. ORGANIZATION OF DBS

DBS is an integrated whole consisting of various users, managers and the management system as illustrated in Fig.1. In this study DBS is required to store bibliographical data as well as relevant text and decimal data which influenced the selection of the data base language (DBL), FAMULUS.

3.1. User objective :

Users of this DBS are estimated as government agencies, housing architects, large construction firms, housing policy and standards imposing authorities. The expectations of users from the output data are defined as follows in this study : the output data must help a) to write specifications for international projects, b) to prepare recommendations to government agencies, c) to prepare and alter existing housing standards and regulations, d) to write housing bu-

ilding programs, e) to prepare and write specifications for tender or contract stage of large housing projects.

These objectives can be met referring to housing standards and regulations, building laws and legislations. On the other hand users of this DBS may wish to find out specific information on specific types of buildings, specific types of users, individual building spaces or specific building performance attributes either having cross-cultural character or related to a single country. The other objective then must be to meet the multiple DB users' needs.

3.2. Organization of data :

The design and organization of DB structure depends on the availability of rough data taken from various documents, their internal relations and the DB users' needs when they are handling these data. Rough data of this study are found in documents which can be related to different building levels, and these building levels contain different performance attributes, as illustrated in Fig.2.. Documents, building levels and different performance attributes are three basic elements of this DBS. The relations between the elements are represented in a hierarchical file structure.

The bibliographical records of the documents constitute the first element at the top level of the hierarchy as the first data file (IF-1.) which is designed in correspondence with the DBS system of the Library of Congress, applying same field symbols appropriate to the purposes of this study, to establish a link between two systems.

At the second level of the hierarchy is the building level element indicating the different characteristics of the document related to building spaces, number of people living in that building, the building subsystems under consideration which are brought together into the second data file (IF-2.).

At the third level of the hierarchy a group of fifteen files are designed to represent the performance attributes of building spaces and subsystems, such as equipment (IF*EOUNP), space (IF*SPAC), fire (IF*FIRE), hygiene (IF*HYGI), etc. (Fig.2). These files and their field names are basically selected according to ISO/DIS.6241 (2) and US Census classification.

The limitations of FAMULUS influenced the design of this DBS because it was possible to open 25 fields in a data file citation (record) and 4000 character in a single citation. A compressed field as a common code (CRD) is designed in the beginning of each citation to establish relations with other citations in the same file and citations in other files.

Each compressed code (CRD) covers symbols of the country, legal status and coverage of the document, type of living quarters, construction status and the accession number of each document.

3.3. Application programs :

Application programs are designed to control the computer and to provide instructions about the actions to be taken on data. In this study application programs comprise the application program family. Each application program is put into a separate runstream file to deal with single or multiple purpose

functions. Each application program runs independently. Even between two application programs running concurrently no coordination is possible.

Each DB user may have different needs with respect to a data file. Different user needs require varying application programs having different functions. An application program may not necessarily have only a single function. There are eleven functions in FAMULUS such as edit, sort, merge, multiply, galley, index, search, key, etc.. In this study an application program file takes an input file or an output file of another application program as input file, and has single or multiple function output files. An example from the application program file family of this DB is illustrated in Fig.3.

3.4. User programs and guides :

For the security as well as reliability of the application programs, user programs were prepared to be seen on the screen by users to enable them to enter DBS with very simple statements or single words. "Read only" and "Write only" statements are used for these screen files. Only DB personnel and DB manager are allowed to enter into input files and application programs. The assembly of created user entry words comprises a new language for the utilization of newly created DBS. When these words are written on the screen they go to the application programs as a small function instruction file.

A DB user guide book and a screen information manual with a glossary have been developed, because of the large number of data files (17 files) and field names (134 fields). A glossary helps to find out the key words, field names, contents of the fields, dividers, etc.. The details of the CRD are also included in the glossary and the guide book. The guide book helps to use DB step by step utilizing the glossary and screen guides concurrently.

4. DIRECTIONS FOR FUTURE STUDY

A DB of this kind is not a frozen storage of data. Operations of multiplying, editing, ossifying provide facilities to transfer data out of the system to update the whole DBS, deleting, rewriting and changing the data.

This DB structure is not only used for this type of cross-cultural performance attributes, but it can also be fit to the data taken from a performance requirements catalog for a single project or knowledges of experts from professional practice on housing. Also, same data structure can be developed for different purpose buildings other than housing, such as tourist accommodation buildings, offices, schools, etc..

The results of scientific studies on the performance attributes of different elements and spaces may be stored utilizing the same DB structure. Such a DB can be a scientific information source at any stage of the design process. Thus it will help to bridge the gap between the scientific studies and the building practice in the future office environment.

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REFERENCES

1. Anon. "FAMULUS System", University College London Computer Centre (1971).
2. ISO/DIS 6241, "Performance Standards in Building", (International Organization for Standardization, 1982)

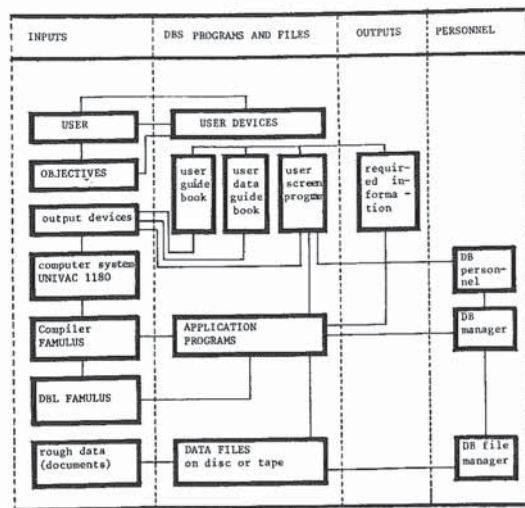


Fig.1 The data base system designed in this study.

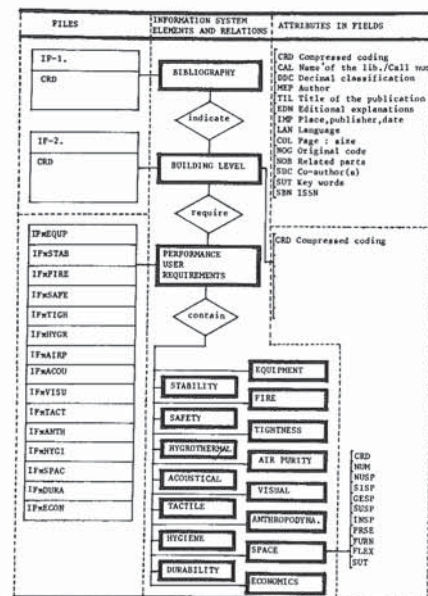


Fig.2 The correspondence between the files, elements and fields.

```

@ED,0 RE.EQUIP-ESOGSE
ED 29E 05/01/84 11:59 EQUIP-ESOGS(6):A
EDIT
****
1: @ASG,A IF-EQUIP.
2: @ASG,A IF-EQUIP0.
3: @ASG,A IF-EQUIPSE.
4: @USE 9.,IF-EQUIPSE.
5: @USE 10.,IF-EQUIP0.
6: @XQT UOM*LONFAM, SORT ]
7: /ID/EQUIPMENT REQUIREMENTS
8: /FIELDS/(CRD,NUM,KIT,LIV,DIN,BAT,STO,GAR,MEC,SUT)
9: /NEW ID/EQUIPMENT REQUIREMENTS
10: @USE 9.,IF-EQUIP0.
11: @XQT UOM*LONFAM,GALLEY]
12: /ID/EQUIPMENT REQUIREMENTS
13: /FIELDS/(CRD,NUM,KIT,LIV,DIN,BAT,STO,GAR,MEC,SUT)
14: /PRINT BY SUBJECTS/
15: /NEW ID/EQUIPMENT REQUIREMENTS
16: /WIDTH/(60)
17: @USE 9.,IF-EQUIP0.
18: @USE 10.,IF-EQUIPSE.
19: @XQT UOM*LONFAM,SEARCH]
20: /ID/EQUIPMENT REQUIREMENTS
21: /FIELDS/(CRD,NUM,KIT,LIV,DIN,BAT,STO,GAR,MEC,SUT)
22: @ADD SEARCH,USSE-EQUIP]
23: /WRITE TAPE/
24: @EOF
EOF AT LINE 24
****
END EDIT 24 LINES OUTPUT
    
```

Handwritten annotations on the code:

- "input file from editing application program" points to lines 1-4.

- "function" points to lines 6, 11, and 19.

- "statement from user screen program" points to lines 22-23.

Fig.3 A sample multi-function application program for equipment file.