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PISAR: A TIME-ORIENTED DATA MANAGEMENT SYSTEM

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INTRODUCTION

There have been several Data Management Systems in the MUMPS language that have evolved from what is now called "Old" MISAR (Karpinski and Bleich, 1971). Developed at Harvard Medical School, Old MISAR arrived at the University of Wisconsin in 1975. As a dictionary-driven system with a basic simplicity of global design, it was very appealing as a starting point for more elaborate systems. PISAR, WISAR (Entine et al., 1977), and "New" MISAR (Geer, 1977) have evolved over the last few years, are now much more sophisticated than their common ancestor, and have little more than a similar name in common with Old MISAR.

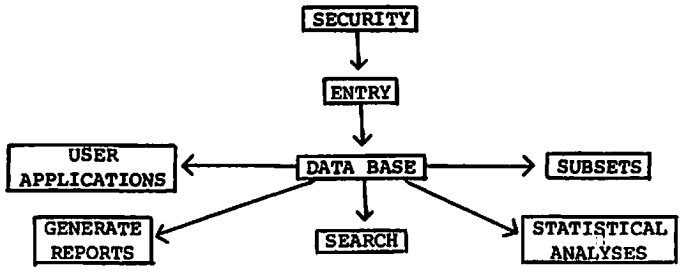
PISAR is a Data Management System designed expressly for handling information about people that is collected over a number of contacts. It is a flexible system that has been found useful in both medical and social services environments. There are presently 15 PISAR data bases in such areas as psychiatry, gynecology, ophthalmology, rehabilitative medicine, primary care, mental health, etc.

When PISAR was originally being designed, it was agreed that the best way to guarantee its acceptance, usefulness, and data integrity was to design it so that it would lighten the load of the secretaries upon whom the main burden of data collection and entry falls. The clerical staff find that it is easy to use and that it reduces considerably the great amount of time previously spent in hand-preparing both routine and special reports. Because of its usefulness to them, the secretaries are zealous about collecting the accurate data that are critical to those who use PISAR chiefly for research, planning, and evaluation.

This paper describes the general structure of PISAR and some particular design details.

BASIC STRUCTURE OF PISAR

PISAR has the following design:



It has an ENTRY routine which collects and edits the data and many other routines which scan, analyze, and print out selected information. There is a SEARCH routine which queries the data base and finds selected patients. These patients can be stored as a subset for future reference. There is a versatile REPORT GENERATOR, which allows creation of many useful forms of reports. The STATISTICS routines are somewhat limited currently. They include a basic analysis package (count, range, minimum, maximum, mean, median, mode, standard deviation, etc.), a tabulation, and several other modules. The statistical area will be expanded in the future.

PISAR's RETURN routine looks up patients due on a specified day and prints out information about these patients. Its APPLICATIONS routine allows a user to hook up to programs specially written for that user's data base. Other routines include subset handling abilities and user information.

Because of its diverse use, PISAR had to allow much of its terminology (e.g., patient, client, student, resident, or whatever) to be assigned by the user. The only required data base items are ID number, date of contact, and number of contacts. However, the same items are repeated, possibly under different names, in many data bases. Relative date, return date, age, sex, etc. are all common items. PISAR has a number of routines which utilize these items if they exist in a data base.

TIME-ORIENTATION

A time-independent data base may have the following structure:

PATIENT

ID #	____
NAME	____
SEX	____
BIRTHDATE	____
PROVIDER	____
TREATMENT	____

WISAR is an example of a very powerful system using such a design.

A time-oriented data base, such as PISAR, may have this format:

PATIENT

ID #	____					
NAME	____					
SEX	____					
BIRTHDATE	____					
PROVIDER	____	____	____	____	* * *	
TREATMENT	____	____	____	____	* * *	
DATE	____	____	____	____	* * *	

The basic structure of a time-oriented system is much more unwieldy than that of a time-independent system.

PARTICULAR DESIGN STRUCTURE OF PISAR

A time-oriented system needs to define how the data are updated. Five types of updates have evolved in PISAR. "None" is for one-time only entries, such as birthdate, that may be edited but will never vary over time. "System" is for those items that do change but the system itself makes those changes, not the user. For example, the system keeps track of the number of contacts, the relative date span, and even the patient's age (given the birthdate). "Response" means that if a new value is elicited and entered, it is stored, but if no value is entered the data are considered missing. For test results such as blood pressure, this may be the update of choice. In a human environment, however, much of the data from one contact to the next is the same as that which was previously entered. "Lookback" means that if a new response is elicited and entered, it is stored, but if no value is entered, the value is considered the same as it was last entered. This saves entry time and can also save a tremendous amount of storage. There are two types of "Lookbacks". One allows deletion for items such as comments. The other does not allow deletion of the response, for items such as provider or marital status.

With medical data, an item may often have more than one answer; for example, there might be several diagnoses. It is possible to create a dictionary with many items asking the same question, to catch all those potential answers. This can result in a greatly inflated dictionary and can cause problems in searching, printing, and analyses. Instead, PISAR allows a user to enter multiple responses to an item and the system interprets it as if they were many items. Frequently, a user wants to answer two items with multiple responses in such a way that the first response to the first question (e.g., the first provider listed in the provider question) is matched to the first response to the second question (e.g., the first fee listed in the fee question). This "relatedness" among items can be defined by the user and handled in the PISAR routines.

PISAR is written in MIIS, a dialect of MUMPS, and runs on a PDP 15 and a Data General Eclipse C330.

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