

## The System

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In the March-April, 1979 Newsletter of the Conference Board of the Mathematical Sciences (1) appeared the following brief paragraph entitled "Concept of Computer Proof Disturbs Philosophers".

"The changed conception of proof involved in the 1977 Appel-Haken proof-by-computer of the four-color theorem is disturbing some members of the professional community in philosophy, according to a review in the 20 February 1979 Chronicle of Higher Education of a paper scheduled to appear in the February 1979 Journal of Philosophy. The paper, 'The Four-Color Problem and Its Philosophical Significance' by Professor Thomas Tymoczko of Smith College, contends that a computer proof which no one actually sees in detail amounts to an appeal to authority rather than a demonstration. Professor Haken is quoted as commenting, 'Anyone, anywhere along the line can fill in the details and check them. The fact that the computer can run through more routine details in a few hours than a human could ever hope to do in a lifetime does not change the basic concept of the mathematical proof. What has changed is not the theory but the practice of mathematics.'"

I will paraphrase the last line - what has changed (with the development of computerized nutrient data bases) is not the theory but the practice of translating food consumption into its nutrient content.

The dietitian, who practiced her lonely art with a printed table of nutrients to translate dietary intake or to plan dietary intake, is still the same person with the same responsibility. But suddenly, or so it may seem to some, she or he is no longer lonely. She or he is involved with information specialists, systems programmers, application programmers, statisticians, epidemiologists, and others who, to a greater or lesser extent, are helping her discharge her responsibility. In many instances, these persons put limits, related to their own areas, on her ability to do what needs to be done. The printed table of nutrients now resides in something called a computer which may or may not be in the same building or in the same city but is likely to be completely invisible, reached either by a typewriter-like machine connected to a telephone or by putting information into an envelope. Information comes back in an envelope or rapidly

printed out on a piece of paper. Suddenly the users, the generators of information and the interpreters of information, find themselves not in control of the information system which presumably was created for them. The loss of control started when the user was not considered a primary contributor to the design of the system.

Of course, the foregoing is exaggerated and applies to none of the computerized data bank systems developed by persons in the audience here. It is only those others to which my description applies.

Note, I used the phrase computerized data bank systems - not computerized data bank. A computerized data bank, by itself, is no more than the printed table placed in a machine which by its nature can perform table lookups and calculations with extreme speed and accuracy.

The use of the word system relates to the concept that the nutrient data bank is part of an information system. Borrowing from information theory, the goal of the information system, of which the nutrient data bank is part, is to improve the accuracy of the messages coming from the system by reducing the probability of transmission failure, distortion and accidental additions.

This relatively lengthy introduction to my part of the State of the Art using the HVH-CWRU nutrient data base as the model is to clarify for you my meaning of the topic of my presentation - The System. The computerized file of nutrient data is just that - a file - and the thing of interest is the information which is used to give form or character to what our lonely dietitian wants to know. So now we come to the system which for our purposes we will choose to define as the state or condition of harmonious, orderly interaction.

This interaction is among the user of information, the supplier of information, the persons responsible for generating and storing the data file, and those processing the input and output information. While we usually manage to keep the interactions orderly, per the definition, we at times have difficulty in keeping them harmonious.

The most critical person or persons in the interaction is the user of information. The most elegant system will not be used if it does not meet the needs of the user. We have tried to listen to our users and be responsive to their needs. (I believe the previous presentation by Mrs. Uhrich illustrates this.) The technicians must not be in control of the system.

Of course, one cannot create a new system for every user nor, as Dr. Goffman will point out this evening, can a single system meet the needs of users who have quite different applications such as research, education, and practice. If, however, the potential uses are kept in mind, then a basic system can be

developed with sufficient flexibility to be able to respond effectively to a variety of users. This we have attempted to do and we have been able to respond to a variety of users.

The parts of our system are the instruction and coding manual, the programming for editing, error checking, nutrient analysis, and output formatting, and the nutrient data file. While primary responsibility for each part rests with an individual, overall responsibility for planning lies with a team of users, coding and data entry clerks, dietitian, nutritionist, systems programmers, and biometricians. Absent from this list is the supplier of the basic data in many uses - that is the subject or patient. Such persons did have input early on and certainly should be considered in development of the system.

In conclusion, the computerized Nutrient Data Bank is a data file. It should never be an end in itself. To borrow from Bell Telephone - the system is the solution. Without a telephone directory there would be no need for a system - but without the system the directory would just take up space - or could be used as a door stop - a use also for a printout of a 2400 item nutrient data bank.

#### Reference

1. Newsletter, Conference Board of the Mathematical Sciences Vol. 14, No.2, p.20, March-April, 1979, Washington, D.C.