EVALUATION AND ENHANCEMENTS OF COMPUTER CONTROLLED TELEPHONE INTERVIEWING

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INTRODUCTION

AMRIGON has been conducting Computer Controlled Telephone Interviewing (C.A.T.I.) for over four years. The operation has been continuous and services a wide variety of clients on a large number of terminals.

This paper discusses the evaluation of this system from inception through 3 generations of programming.

BACKGROUND

AMRIGON is a commercial marketing and survey research organization. In the spring of 1976 when we first approached C.A.T.I., the perspectives that we carried meant that the system had to be . . .

- FLEXIBLE and FAST
  Commercial clients want results quickly. The system had to be capable of handling a wide variety of survey designs. It also had to be capable of adapting to new applications and questionnaire techniques with a minimum of effort.
- EXTENSIVE
  Unlike some other commercial research firms, AMRIGON'S questionnaires tend to be long and complex. In this respect, we are probably more like an academic or social research organization. Thus, the system's capability had to be extensive.

and...

- COST EFFECTIVE
  Cost effectiveness in the commercial environment translates into competing with telephone data collection methods that have inherently less quality than computer-controlled systems.

Two other factors played a heavy role in AMRIGONS C.A.T.I. development.

(1) There were no other systems available from which to learn. The only other system in operation was proprietary and operated on a large main frame system which shared its cost economies with other business applications.

(2) We made a commitment to a client that a major study using C.A.T.I. would commence within 3 months... and not a single line of programming code had been written. We had, however, spent 6 months planning for our needs.

DECISION COMMITMENT

These circumstances lead to some important philosophical approaches. In retrospect, the decision we made in C.A.T.I. development seemed simple and obvious. We might suspect that under less pressured times, we would have undertaken the development more slowly and made less of a commitment. However, this would not have lead to a better design. In fact, we found the more direct and complete the commitment to C.A.T.I., the better the system.

This leads us to postulate three philosophical axioms about C.A.T.I.

FIRST AXIOM:

The transition from traditional telephone interviewing should be a single step and implemented as completely as possible. Conversion of the questionnaire functions and sample administration should be taken at the same time. Taking a slow, one, two or three CRT approach will probably lead to a system that will not be able to grow.

SECOND AXIOM:

C.A.T.I. is more than telephone interviewing with a new kind of data entry. The computer adds to the interviewing process... in the same manner as sound did to movies, and T.V. did to the way sports events are reported.

It requires "new thinking". AMRIGON had the luxury of 6 months of planning before any programming was done. We listed completely the tasks performed in hardcopy interviewing and then added "new" tasks that only could be done with the help of the computer.

THIRD AXIOM:

Finally, just as the T.V. producers and directors have exerted some strong influence over sporting events, computer personnel will exert a strong influence over data collection and instrument design. This has proven to be a benefit.

Be prepared to work very closely with computer personnel. In the end, they will teach the researchers discipline in questionnaire design. The best C.A.T.I. systems are designed by system programmers who understand survey research, not the reverse.

THREE GENERATIONS OF C.A.T.I.

At AMRIGON, we are essentially in the third generation of our C.A.T.I. system. The following paragraphs trace the developments of the system with comments on what we learned regarding. . . Hardware. . . Software. . . Interviewing Environment.

FIRST GENERATION

The first iteration finds all three aspects requiring approximately equal amounts of attention.

Hardware: The machine concept is most critical. We believe we made three correct conceptual decisions.

(a) AMRIGON chose a MINI-COMPUTER designed for dedicated systems with the economics to justify their usage.

(b) The operating system we selected was a TIME SHARING one. It reduces development and maintenance programming dramatically.

Hardware... (Continued).

(c) We did not configure the hardware with a "thin" memory. Money spent on memory hardware will be returned many fold in programming effort and production productivity.

Software: The 6 months of specification detailing was time well spent. A well thought out and thorough review of questionnaire functions, sample administration and interviewer control by researchers and production personnel will save many months of redesigning the system later. The programming staff should be an integral part of this team from the very start.

Interviewer Environment: The physical interviewing environment deserves a redesign at this time also. Interviewers will need more desk space for the CRT's. They also will require more air circulation.

We followed the example of several airline reservation systems. . . more open design of work stations and a bright, professional-looking environment.

SECOND GENERATION

The second generation of a C.A.T.I. system might best be described as the "Age of Software".

Hardware: If the "time sharing mini" is configured with enough memory almost no changes are required with the hardware. We did add some communication equipment for the addition of several CRT's.

Software: Additional questionnaire tasks are the first things to be added. Most, if not all of these, are of secondary character. These are special items that are used infrequently and other "niceties".

More programming effort is now spent on Sample Administration. The computer makes it easy to gather and calculate many more statistics about dialings and respondent contacts. This is especially helpful in improving Random Digit Dialing productivity.

Statistics about interviewer productivity are also greatly enhanced. Of course, output is measured on an individual interviewer basis. But we go beyond this to analyze the data and find problems in the questionnaire itself. We study areas where a particular interviewer is having trouble, for example, an unusually high rate of refusal on the income question.

The greatest attention and effort is spent on programmer and researcher collaboration. This is the stage where C.A.T.I. offers its greatest rewards. Techniques and methods that could not have been done with hardcopy questionnaires are now conceived and tested. True randomization of questions is done and control of the pace of the questionning process is accomplished. We even deliberately slow down the response time between questions to force a respondent to answer with a prescribed amount of "thoughtfulness". We control whether or not a respondent will be reminded of his previous answers or those given by other members of his household. Dynamic branching is based on a probability distribution that is constantly updated from other respondent's answers. Sample characteristics and other answers are compared by day, date, and time of interview as well as by the sex of the respondent. Some of these statistics could have been obtained before, but somehow no one ever got around to collecting it without C.A.T.I. help.

Interviewer Environment: The big impact in this aspect is not with the interviewer but with the supervisor. Now time is spent not on sample control and editing of questionnaires, but on training and motivational techniques to encourage good interviewing practices.

THIRD GENERATION

In this phase, essentially all resources are focused on pre and post interviewing software as opposed to C.A.T.I. per se.

Software: Some further enhancements are made as researchers keep thinking up new and different design elements. The real effort is focused on automatically interfacing the C.A.T.I. output with other computer programs for tabulations and analysis. This is a "mechanical process" and no different than matching other data files.

Effort is also devoted to simplifying the specification parameters used in establishing the C.A.T.I. questionnaire.

We found attempts to use the C.A.T.I. parameters to impact on tabulation programs as useful. However, use of C.A.T.I. parameters as variable label descriptors was counter productive.

IMPACT ON INSTRUMENT/QUESTIONNAIRE DESIGN

Throughout the evaluation of C.A.T.I. at AMRIGON the process has dramatically impacted the researcher and the questionnaire content. It is equally dependent on computer software and social/marketing research. The impact for the questionnaire designer is as follows:

(1) Discipline: No longer can things be allowed to run and then "cleaned up" in coding and post processing. Little details must be accounted for before the interviewing process begins. C.A.T.I. doesn't enforce a handicap, it encourages what should be done in the first place.

(2) Flow Chart Thinking: The cross discipline nature of C.A.T.I. means the researcher is likely to pick up techniques used in data processing. One of the most beneficial is "flow charting". When used on a questionnaire, it encourages a clearer thinking about the interviewing process and often results in an improved questionnaire.

(3) New Measurement and Control: As discussed above, the variety of new measurements and increased control are the major benefits the C.A.T.I. gives everyone. To the researcher, this should open as many doors as creative design can conceive.

Finally, the most important impact of C.A.T.I. has been. . .

(4) Questionnaire/Interview Re-Think: Because the researcher has had to... describe in detail to the programmer what he wanted done... plus add an increased discipline to his work... and challenge his creativity... the whole entity of the questionnaire and the interviewing process has had a chance to be rethought. This has resulted in refreshingly new questionnaires.