

The Market Research Terminal and Developments in Survey Research

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Survey research has an important place in marketing evaluations and assessments, and in opinion-attitude polling and a wide range of behavioural-social-medical research. It is somewhat surprising that certain inefficient and time-consuming procedures in survey research have received but little attention.

This paper reports upon a major and fundamental development in survey-behavioural research. The Questronic project based at the University of Sheffield and its first commercialized product, the Ferranti Market Research Terminal (MRT), focuses upon the procedures of data recording techniques, data preparation and evaluation and, for example, has sought to remove the tedious and costly subsequent encoding of data and preparation for input to the computer from field situations. Hopefully, the achievements of the Questronic project to date will provide an impetus for behavioural research in general, and will be of particular advantage in market, opinion, economic, social and medical-survey research programmes. Various aspects of the work reported upon here have been the subject of a number of filed patents at national, European Community and extra-European levels. [1, 2, 3].

The MRT, a battery operated hand-held data capture terminal, is an electronic replacement for the 'clipboard and pencil' used for gathering questionnaire-type information, that is, responses to lists of multiple-choice questions. It has a keyboard for data entry and electronic

storage for the data to be typed in. This approach to data capture offers real advantages for survey research, both economic and operational. These accrue for the following reasons:

- i. Since the data is typed in and then stored electronically, it is already in a form that can be fed directly into a computer for subsequent processing. This eliminates the need for data preparation, coding, punching etc. (see Figure 1).
- ii. Elimination of the data preparation stage means that not only is its cost saved, but introduction of errors will be avoided.
- iii. Elimination of data preparation means that the associated time delay is avoided enabling faster and therefore, more topical surveys, or conversely, larger samples.
- iv. Paper questionnaires for a survey are reduced from one per interviewee to one per interviewer, thus saving on stationery and handling costs. It is also likely to save on time for the duplication of questionnaires.
- v. For a particular survey, the interviewer does not have to keep clipping and unclipping questionnaires for each interview.
- vi. Interviewers become more productive and accurate through the use of a keyboard for data entry.
- vii. If, traditionally, one has relied upon the mailing system to transfer completed paper questionnaires to a central survey office, one may now perform this function electronically. The MRT can transfer its stored data, in conjunction with a low cost acoustic coupler or modem via a telephone line to the computer. This means that data can be in for processing much faster, again permitting the survey to be more topical.
- viii. The MRT is reliable and robust, and the above advantages will accrue throughout its long life.

The unit is lightweight and convenient to use. It is weatherproof and ideally suited for the rigours of outdoors. Interviewers require no technical expertise to operate the device beyond the minimal training required to become fully proficient in its use.

#### Normal Operation

The interviewer uses the MRT to type in answers to the questionnaire which is clipped onto the device. The interviewer sees on the display his or her identification followed by the identification of the questionnaire for which the device has been set up. There then follows a series of prompts for each question in turn giving the question number and the permitted answers, the multiple choices, for that question. The interviewer simply types in the answers, then moves on to the next question. This process is repeated until all the questions are answered and the questionnaire is complete. At any time during this process, an answer that has been typed wrongly can be corrected. If required, the current questionnaire can be abandoned and all its answers deleted. Finally, the interviewer can display how many questionnaires have already been filled in during the current survey.

Answers are stored in a plug-in, reusable Answer Module. Dependent on model, up to 6600 "multipunch" answers can be stored, plus questionnaire codes and the interviewer, interviewee and survey IDs. When an Answer Module is full it is easily replaced.

#### Standard Link Up Operation

In this mode, the MRT can transfer the data that has been keyed in during a survey, directly into the computer. The exact operation of this function will depend on how the computer software is arranged and the way the MRT has been set up. Some of the jobs that can be done will be briefly outlined. As well as user identification and questionnaire data, the MRT can store messages and these can be used to control the software

in ones computer. One can set up the device, therefore, so it will activate the data processing software in the computer with simple key-strokes at the MRT.

The MRT questionnaire format can include up to 200 questions per interview, with a maximum of 12 possible answers to each question. The MRT has rechargeable batteries (reference BRM3) of 10 volts with an operation time of ten hours in normal operation mode. The recharge period is of 10-14 hours although a spare battery set is of quite reasonable cost.

#### Master Set Up Mode

In this mode the following groups of facilities are provided:

- i. Test facilities for the MRT.
- ii. Facilities for setting up the MRT using the keypad.
- iii. Facilities for setting up the MRT using your computer, 300 or 1200 baud communications.
- iv. Facilities for transferring questionnaire data to the computer.

The diagnostic facilities provide a self-test for the MRT. One can test the device's memory module, its ROM (Read-Only-Memory), its communications port, its display and its keypad. These facilities enable one to satisfy oneself that the device is in proper working order prior to the commencement of a survey.

The facilities for setting up the MRT using the keypad also enable one to specify the following items:

- i. The messages that are to be transmitted to the computer during a link up session.
- ii. The identification of the interviewer, transmitted to the computer during a link up session.
- iii. The identification of the questionnaire, transmitted to the computer during a link up session.

iv. The transmission rate for the data transfers between the computer and the MRT which may be set to 300 or 1200 baud depending on the requirements of your computer.

The facilities for setting up the MRT using the computer, enables the computer to specify all the items mentioned above for setting up and using the keypad, excluding the transmission rate. This must be selected using the keypad. One can, in addition, use the computer to set up the 'dimensions' of the questionnaire. That is, one may specify how many multiple choice questions there are, and how many choices there are within each individual question. This feature serves to ensure that the interviewer does not mistakenly type in answers for questions or choices that are not on the questionnaire.

The facilities for transferring questionnaire data to the computer function in the same way as already described for the standard link up operation mode. The only difference is that as a subset of the master set up operation mode, one has access to the rest of the master set up facilities as well. Typically, the interviewer would be restricted from using the master set up mode, but would use the standard link up mode to transfer the questionnaire data. The MRT enables such a restriction to be made.

#### Developing Procedures

The efficiency and rapidity of developed Quesstronic routines, incorporated into the MRT, can now overcome certain of the traditional vagaries of survey research, for example those associated with the Heisenberg Uncertainty Principle. That is, the very act of measuring a phenomenon changes the phenomenon being measured in such a way as to make future readings, if not unpredictable somewhat more uncertain.

This is seen to particular effect in changing responses in the time-lapse following upon, for example, exposures to various forms of media advertising. An interesting example in opinion-polling research comes from the Brecon and Radnor parliamentary by-election of 4 July 1985. The fieldwork undertaken by MORI two days before and on the morning of the day preceding the by-election gave Labour an 18-point lead whereas the election recorded a 2 percentage points victory for Liberal over Labour. Robert Worcester of MORI attributed such a massive error in prediction to problems of spatial and social sampling procedures and a somewhat higher than average non-response rate<sup>(4)</sup>. There is, in fact, a well documented literature on famous polling failures<sup>(5)</sup>.

A crucial feature in such failures appears to be the time-lapse ensuing between survey and the poll itself. The ostensibly vitriolic statement of Mr Arthur Scargill, leader of the National Union of Mine-workers, referring to an increasingly left-wing dominated Labour party, issued on the lunchtime of the day prior to the by-election was widely reported in evening newscasts on radio and T.V. and in the press on the morning of the by-election. Our subsequent evaluations suggest that this, more than any other factor, was of crucial importance in comprehending the result.

The developed Quesstronic-MRT procedures, with their ability of instant processing and reporting upon such changes or specific exposures to T.V. advertising campaigns will now be able to note such longitudinal changes. Surveys may thus be undertaken prior to and following on, for example, media advertising campaigns and after a time-lapse and results will be available immediately the survey has been completed. Thus our developed routines will not simply satisfy present survey requirements but effect improvements and developments in these procedures, for example by enabling specific temporal changes to be recorded, unfettered by the

previous problems of time-lapse and laborious and out-dated data processing methodologies. Furthermore our continuing investigations demonstrate that the use of the MRT, for example, facilitates improved eye-to-eye contact with respondents, enables more questions to be asked in a finite period and significantly reduces the number of refusals. This will be reported upon more fully elsewhere and at a later date.

Further details may be obtained from the senior author at the University of Sheffield, Sheffield S10 2TN, England. The retail price of the unit in the U.K. is presently £350 (US \$450) but sizeable discounts are available upon bulk purchases.

#### Concluding Remarks

The developed routines thus represent significant savings in actual and overhead costs in performing survey research. A particular attraction is the removal of a traditional bottleneck at the data preparation stage for input into the computer. How those boring sessions were loathed by one and all. The MRT likewise provides for improved data accuracy and results in a dramatic decrease in the elapsed time from designing a survey up to its fine completion. Fieldworkers become more efficient and effective; they are released from carrying numerous copies of completed and uncompleted questionnaires; they are free to concentrate on the survey target subjects. The completed survey details are rapidly passed back to and assimilated by the computer for immediate analysis. In essence this all results in the saving of those two prime resources - financial cost and time.

Of course the developments briefly reported upon here will not only have a technological effect but more importantly a structural impact of prime importance on survey research. In future the findings from specific surveys will be reported immediately and in, for example, marketing,

opinion, political or product-testing strategies data on specific changes in opinions-views will be recorded, processed and reported without the traditional time-lapse period. Change is very much in the air!

It is hoped that this brief report has indicated the realized and continuing ebullience of the Questastronic programme and the importance of developed MRT routines in survey research.

References

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Figure caption

Figure 1

The Questronic sequence

