

From DOS to Windows: Usability Issues for Interviewers

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Abstract

Social Survey Division (SSD) of the Office for National Statistics (ONS), UK employs approximately 700 interviewers at any time. The interviewers use laptops and computer-assisted interviewing for the vast majority of data collection. Since the late 1980s we have been using the Blaise software as our questionnaire development and interviewing tool, and all interviewing and support systems have been DOS based.

With the increasing use of Windows and Windows-based software, ONS are now at the stage of considering a move to the Windows operating environment for interviewing. This paper looks at the issues around a move to Windows, in terms of its usability by interviewers. It discusses new possibilities and constraints of using Windows-based software; interviewer views on usability; and training options for interviewers.

Keywords : Usability; Windows; Interviewers; CAI

1. Introduction

The majority of surveys carried out by the Social Survey Division (SSD) of the Office for National Statistics (ONS) are completed using computer-assisted interviewing (CAI). CAI, using Blaise software, was introduced for the Labour Force Survey in 1990 and for the majority of its other surveys from 1994.

The Windows operating system has been the ONS office standard for some time but the systems used for carrying out surveys remain DOS based for various reasons. A Windows version of Blaise, Blaise 4 Windows (B4W), has been available since the beginning of 1999. It has now been thoroughly tested and is used for survey data collection in Europe and in the USA. For the last few months we have been considering whether to move our interviewing systems to the Windows environment and if so, which issues need to be addressed.

In considering an impending move, ONS carried out a brief review of the move from Blaise 2 to Blaise III. This revealed some unanticipated problems at the time of the move, not particularly with the Blaise software, but mainly concerned with co-ordination of all the interviewing systems and with the amount of change occurring. Although we had thought that the transition would have little effect on interviewers, as there were only minor changes in the Blaise interface, in fact they were affected a great deal.

Two valuable lessons learnt from this exercise were that

- the implications of change must be considered for the whole interviewing process and not just for the part which is changing;
- interviewers' needs must be considered a high priority: the quality of our data is dependent on their ability to work with the interviewing systems.

These two points appear repeatedly in research on usability of CAI systems. Rather than reinventing the wheel, we thought it would be useful to work with usability guidelines and testing techniques when contemplating any further changes to interviewing systems.

This paper reports on the early stages of an ongoing project to manage the introduction of Blaise 4 Windows in Social Survey Division.

2. Why Move to Windows?

Over the last year, ONS has been evaluating the pros and cons of a move to the Windows environment for interviewing, and in particular a move to Blaise 4 Windows. Upgrading to new software is often thought to be rather straightforward and not worth worrying about. However, significant changes to software can sometimes lead to large costs in reprogramming and/or retraining. Unless the benefits from an upgrade are substantial then there may be good reasons not to change: after all, if something works why change it?

A paper presented at the 1998 International Blaise conference (Bushnell, 1998) discussed the costs and benefits of upgrading to new CAI software and the tools and strategies which could be adopted to facilitate an upgrade, reviewing the move from Blaise 2 to Blaise III and looking forward to the move to B4W.

Blaise 2 to Blaise III

Several years ago, the team at Statistics Netherlands responsible for producing Blaise decided that Blaise should move to a Windows environment but survey organisations using Blaise did not have the appropriate infrastructures for such a move. Improvements to Blaise 2 were long awaited so the Blaise team developed Blaise III as an interim measure. Blaise III was intended as a stepping stone to a Windows product: it is DOS based but was written so that it could be easily converted to Windows and the 'look and feel' was very similar to Windows applications.

Although the costs of moving to Blaise III were fairly large (substantial changes had to be made to every CAI questionnaire), the benefits were also large: the ability to build very large questionnaires, increased functionality in programming language, improvements in dealing with data external to the interview (e.g. lookup tables or coding files), improvements in movement through the questionnaire, new data formats for recording times, dates and verbatim responses to name a few.

Blaise III to B4W

A move to B4W would not net as many gains as the move to Blaise III, but the costs should be a lot lower. B4W and Blaise III were designed so that programs and data are fully compatible between the versions: i.e. a questionnaire written in Blaise III can be run in B4W and vice versa. The first version of B4W was intended to have exactly the same functionality as Blaise III so that it could be released quickly. However, in the end, some new features were included: vastly improved multi-media capabilities and a built in audit trail.

A move to the Windows operating system itself seems rather more problematic than the move to B4W. As well as considering the CAI software, we must also consider the surrounding support systems, such as case management and transmission systems. All our existing systems are DOS based and would need to be rewritten. In addition, the interviewers' laptops would have to be upgraded to cope with the increased demands of Windows applications.

The main costs and benefits of a move to B4W are summarised below.

Benefits	Costs
New features of B4W: the multi-media changes would allow us to use Audio-CASI ¹ and the audit trail would enable us to reconstruct lost or damaged data	Interviewers' laptops must be upgraded or replaced
Improved developer's environment: questionnaires can be written and tested more easily and quickly than in Blaise III	Interviewing support systems must be rewritten
Maintain or improve competitiveness in survey research market	Potential for data quality to be jeopardised while interviewers get used to new system
	Interviewers must be trained in new interviewing systems

Conclusions

Our first impression was that the benefits of upgrading to B4W were outweighed by the large costs involved. However, a review of software looking at Year 2000 compliance revealed that one of the components of the interviewing support systems would have to be rewritten. A decision was made to rewrite the system as a Windows application and so this meant that all the support systems would also have to be rewritten for Windows. In addition, routine replacement of interviewers laptops was already scheduled and these new laptops would have to be suitable for use with the new Windows support systems.

Since two of the major constraints on the B4W upgrade were effectively removed, and the cost of upgrading to B4W itself would be minor compared to replacing laptops and rewriting support systems, a decision was made to move to B4W as soon as practicable, subject to further evaluation of the impact on interviewers.

3. Usability

Couper (1994) notes the potential interviewers have to impact the data collection process but the minimal training they receive in the computer hardware and software and the diversity of their computer skills and knowledge.

The interviewer should therefore be considered an important, if not the *most* important, user of a CAI system since they are our primary link with the data source, the respondent.

In 1994, Couper proposed the idea of using research from the human-computer interaction field to evaluate CAI instruments. Since then studies have been carried out on particular aspects of CAI questionnaires, both for interviewers in standard CAI surveys and for respondents in self-administered survey instruments (e.g. Hansen, Fuchs & Couper, 1997; Hansen, Couper & Fuchs, 1998; Caspar & Barker, 1999).

¹ It is thought that the increased privacy resulting from the use of Audio-CASI (Audio computer-assisted self interviewing) can increase reports of sensitive or socially undesirable behaviour. The respondent is able to listen to a recorded voice playing through headphones and can enter responses directly into the laptop. Audio-CASI may also be used for populations with low levels of literacy where normal computer-assisted self interviewing would not be feasible.

Definitions of the usability of a system include

- “the focus of our attention turns from the system to the user. This means person-centred design rather than system-centred design” (Couper, 1994)
- The ability of users to “perform required use, operation service and supportive tasks with a minimum of stress and a maximum of efficiency (Woodson, 1981)
- “users can work with the application to easily and quickly achieve their goals” (Caspar and Barker, 1999)
- “how easy or difficult it is for users to interact with their CAI instruments and systems” (Hansen, Fuchs, Couper, 1997).

Our aim is to ensure that the transition to B4W is as easy as possible for our interviewers, rather than to look at the usability of Blaise as a CAI system. With that aim in mind, we have started to identify usability issues for a move to Windows and B4W; we will ask interviewers what usability means to them and we will use usability testing techniques to evaluate alternative ways of working, screen designs or training methods. In Sections 4 and 5, I will outline some of the work we have done to date. In Section 6, I discuss work planned for the coming months.

4. Usability Issues for a Move to Windows

Issues to consider when moving to Blaise 4 Windows fall naturally into two components: those issues arising from a change to a Windows environment and those particular to B4W.

Windows specific issues

1. Mouse or keyboard

One of the principal considerations for a move to Windows is whether interviewers should use a mouse for moving around the questionnaire or whether they should continue to use the keyboard, as in DOS-based applications.

The Windows environment is based primarily on using some type of pointing device, such as a mouse or trackball. Although key combinations can be used to achieve the same result, they are often very cumbersome and not always easy to discover. It is fairly obvious that using a mouse whilst interviewing will not be particularly easy: the interviewer may be holding the computer on his/her lap or on the arm of a chair so there may be no suitable place to use a mouse. Interviewers work in a wide variety of household situations where they have little control over the environment. In poor lighting conditions the interviewers may have trouble locating the cursor on the screen: in this case a trackball will be no better than a mouse.

Ultimately, the interviewer is only interested in interviewing and recording the answer given by the respondent and does not want to be distracted by searching for the cursor or trying to minimise or move windows about the screen. We have decided, since there are no clear advantages to using a mouse, that interviewers will continue to use key presses for moving around the questionnaire and accessing Blaise functions.

2. Ability to easily swap to other Windows applications

Although it may be useful for interviewers to have access to wordprocessing packages or email, the drawbacks are many. The ability to swap applications may also lead to accidental swapping out of the CAI software. For maximum gain from working with Windows, we would need to train interviewers to cope with opening, closing and swapping windows, recovering from an accidentally closed window and so on. This would greatly increase training costs. Moreover, it does not seem desirable to train interviewers to recover from problems caused by the software which have nothing to do with the interviewing process: it seems to detract from their task of interviewing.

3. Ease of loading new software

Software loaded by interviewers onto laptops could cause all sorts of problems with viruses or simply with incompatibility of applications. It would make the task of resolving queries from interviewers more difficult if we do not know the exact

configuration of their laptops and software. Some survey organisations in Europe permit interviewers to load personal software onto their laptops as long as it is checked by headquarters staff first. In ONS, this is simply not an option: we would not be willing or able to find resource for checking interviewers' software. We also need to know that all the interviewers are using the same methods for collecting and coding the data: we do not want interviewers to experiment with alternative applications.

4. Consistency of screen design and functionality across applications

Consistency across Windows applications can be very useful for everyday computer users. However, CAI software has a very particular purpose and specialised users. Interviewers are not likely to have access to other Windows software, especially if we decide to limit access on interviewing laptops, and so it is of little importance whether B4W looks and behaves similarly to other applications.

5. Ability to customise worktop, e.g. change colours, fonts, add icons etc.

The flexibility of Windows and the ease with which users may customise their workspace allows users to feel they have some control over their environment, and with respect to usability in general, is a desirable property of most software. However, we must remember that the aim of interviewing is for all respondents to receive a standardised interview. If each interview has a different look and feel to their questionnaire then interviews may no longer be standardised.

Changes to the font size may cause problems with questions 'falling off' the bottom of the screen so that the interviewer misses part of the question, instructions or response list or the font may be so small that it is difficult to read in some situations. Changing colours may mean that some parts of the screen cannot be seen properly or that parts of the question are unintentionally highlighted (or not highlighted when they are supposed to be).

So, it appears that the usual advantages associated with using Windows applications are not particularly relevant when using CAI software, and in some instances, these 'advantages' may actually be a disadvantage.

B4W specific issues

1. Consistency of key mapping

Generally, ONS's policy is to use the defaults provided by Blaise wherever possible unless there is a very good reason not to (e.g. in the move from Blaise 2 to Blaise III the default action attached to the function key F2 changed from <Save Data to disk> to <Delete case> – we decided there was serious danger of interviewers (or developers) deleting data if we used the new key mapping so we reverted back to the original). Blaise provides the possibility for questionnaire developers to change the defaults for function keys, menus, screen layout and some navigational functions but this can be a rather time consuming job. There is also scope for the introduction of errors if these changes are not passed on to the interviewer correctly. In order to take advantage of some of the flexibility in Blaise but to ensure consistency over all surveys, standard settings and configurations are provided for both developers and interviewers (Manners, 1998).

A continuation of our policy of using defaults will mean that interviewers will have to be trained in the new function keys and navigational behaviour, for no particularly good reason, other than that it is easier for questionnaire developers. Consistency over time is interrupted and may result in a brief increase in errors made by interviewers.

Another drawback of using the Windows compatible functionality is that it is more complicated than the previous DOS behaviour. The keystrokes are more complex, nearly all requiring two key presses, e.g. Ctrl-S, instead of using a single function key, e.g. F2. Interviewers are also required to act more often than in Blaise III, that is, in Blaise III they may only have to press Enter to accept the default choice whereas in B4W they often have to use press one or more keys. This drawback seems to imply that the usability of the software will decrease rather than increase.

2. Screen layout and design

B4W allows more flexibility with using colours and fonts for question text, instructions and so on, than Blaise III. Within the Blaise application, restrictions can be imposed so that only questionnaire developers may make changes and not interviewers:

this ensures consistency across all the interviews but allows us to take advantage of improved screen layouts and designs. The default font size in B4W is rather small so it is very likely that we will pick a larger, more legible font. We are also likely to allow some use of different colours to distinguish between different parts of the screen, e.g. interviewer instructions, question text and so on. Any changes to fonts or colours will be standard across all surveys and questionnaire developers will not be permitted to add their own customisations without making a specific case. We do not want interviewers to be bombarded with lurid screen designs nor to be confused about what particular colours signify.

We have found, when introducing colour for some telephone unit interviewers, that there can be problems with certain colour combinations, either inducing headaches or migraines or with people who are colour blind. We therefore plan to test some colour schemes before making a final decision. We may be able to allow interviewers to select from a small choice of colour schemes, but the disadvantage of this is that developers would have to check their questionnaire in all the schemes to make sure that questions were appearing as intended.

5. What Does Usability Mean to Interviewers?

Brown (1988) comments “One of the most useful design philosophies for developing user-oriented human-computer interfaces considers the computer system simply as a tool to aid the user in performing tasks”. Usability, by definition, is all about user-centred design. It seems sensible, therefore, to ask the interviewers, the users of the CAI systems, what usability means to them.

To get some initial ideas, I consulted a group of five interviewers with varying degrees of expertise in interviewing and in computing. After an initial introduction, I asked the interviewers:

- What are the goals you are aiming to achieve?
- What will enable you to reach those goals easily and efficiently?
- What can be done in the move to B4W which will make life easier?
- How should any training for the move be carried out?

The Goal of Interviewing

Interviewers considered their goals were:

- to collect accurate information, quickly and easily AND
- to transfer information accurately and quickly into the Blaise questionnaire.

As well as interviewing, ONS interviewers also complete some work at home: they may complete coding (e.g. of occupation and industry); enter paper diaries (e.g. travel diaries for all members of the household); complete administrative details (e.g. the outcome of the call, number and timing of calls to the household); or submit pay claims.

Therefore, it is important to consider the work done by interviewers at home as well as interviewing completed in the household.

What Enables Interviewers to Reach Their Goal Easily and Efficiently?

The most important issue for the interviewers was that rapport should be maintained with respondents throughout the interview. Anything which detracted from concentrating on the interview was undesirable. Interviewers felt that

- the software should not demand so much attention that eye contact was restricted
- movement around the questionnaire should be straightforward and fast
- it should be relatively difficult to delete data (either at questions or whole interviews)
- there should be a clear differentiation between question text (which is read to respondents) and interviewers instructions

- it should not be possible to switch the laptop off by mistake (this followed from a problem with a particular make of laptop)
- there should be a clear reason why questions are asked (sometimes questions are apparently replicated and interviewers are confused by this)
- there should be more training in the laptop systems (e.g. using modems, case management systems) rather than a concentration on the questionnaire
- training instructions and help desk replies should be in plain English, without making assumptions of interviewers experience or knowledge of computers
- function keys should be the same in all the laptop systems (e.g. the mechanism for making a note should be the same in the questionnaire as in the case management or pay claim systems)

Moving to Blaise 4 Windows

The interviewers discussed a variety of issues under this heading. The two issues generating most discussion follow were:

a. Function keys

One of the main decisions to be made in moving to B4W concerned the mapping of functions, such as adding interviewer notes to the data file. Since using a mouse or pointing device of some sort has been ruled out for the moment (see Section 4) the interviewers must continue using function keys or key combinations for a variety of situations. I asked the interviewers whether they would prefer to keep the key functions the same as they are now in Blaise III; move to the new B4W defaults which are Windows compatible; move to a new system especially devised to be as consistent and logical as possible; or move to a menu-based system.

My hypothesis was that the interviewers would prefer as little change as possible. In practice, the interviewers thought that the existing key functions were not particularly easy to remember or use and were not especially attached to them. The majority liked the idea of a menu-based system, which they had some experience of from the case management system. They thought menus would be particularly useful for working at home: they would not have to remember every function – only the ones used most often in interviewing.

Most of the interviewers were also keen on moving to Windows-based function keys. They thought that the office should keep up with progress rather than staying with the past.

The interviewers' reactions were somewhat surprising, although the explanations they gave for choosing these options were very logical. Without actually consulting the interviewers, we may have ruled out these options without trying them. We will test the practicalities of these options later in the year.

b. Screen customisation

Some of the interviewers thought that it would be useful to use colours more in designing screens. They thought it would enable distinctions to be made more easily between question text, interviewer instructions, question help and so on. None of the interviewers were particularly interested in customising their own colour combinations and could see that this might cause problems.

Interviewer Training

Options available for B4W training are:

- personal training
- home study
- no training.

Personal training could be presented by headquarters staff or by local field managers. Home study could comprise video or audio presentations, an on-line tutorial, comprehensive paper notes, short notes on basic changes or some combination of these options.

Personal training is a very expensive option, especially when carried out at headquarters (HQ) office in London. The time spent producing, presenting and receiving the training, as well as interviewers' travelling costs and time must be paid for. Local training by field managers would reduce some costs but would also require that field managers receive extra training. This could result in variation in the training received by interviewers, depending on the extent to which the field managers are able to master the training themselves, and on their abilities to train others in computing issues. The advantage of personal training, of course, is that each interviewer is guaranteed to receive a standardised training package and that they will complete the training. There is a possibility with home study that interviewers may stop part way through or miss some sections. With personal training, the trainers can cater for all levels of expertise and can ensure that any interviewers with problems are followed up.

Home study is much cheaper: time will be spent preparing the training and interviewers will be paid study time but there are no costs of travelling or subsistence. However, with home study it is more difficult to get the right message across and to cater for individual needs; it is not possible to see where interviewers are getting stuck and, as mentioned above, interviewers may not complete the training programme. On the plus side, apart from costs, interviewers can proceed at their own pace and at their own convenience.

A combination of personal and home study may be the best option: interviewers could complete some home study and be assessed by field managers or by completing a 'test' questionnaire, interviewers requiring further training could receive extra tutorials. However, this is also likely to be the most expensive option and as such, the least feasible.

The option of providing no formal training at all is, on the face of it, the cheapest option of all. Interviewers could be sent some training cases for the surveys they are currently working on and left to figure out the changes on their own. However, this could lead to interviewers losing confidence in the interviewing system and in their own ability to conduct a high quality interview. In the worst case, it could lead to interviewers making mistakes in data capture and therefore to a decrease in data quality: these are costs we would not be prepared to disregard.

When asked which training presentation they thought would work best all the interviewers preferred home study. Their preferences for training methods were:

- video training – although this could prove fairly expensive one interviewer had the idea that each local field manager could receive a video and arrange to loan the tape to individual interviewers in his/her area. S/he could then find out how they had got on with the training and any problems they were having
- on-line tutorial – a tutorial could be written in Blaise itself and presented on the laptop
- brief notes outlining the basic changes, combined with a template which they could carry around with them, perhaps followed later by more sophisticated instructions once the basics were mastered.

6. The Next Stage: Usability Testing

In the next few months we will be consulting more interviewers about usability, talking to field management staff and carrying out some experiments to test various ideas.

Windows

In Section 4 above, I discussed the various issues surrounding the use of Windows for interviewing. Our initial reaction is that the safest way forward is to restrict access to Windows as much as possible. There are all sorts of aspects to the Windows environment which are likely to cause interviewers problems and which we feel would detract from the interviewers task.

Ideally, we would like to replace the Windows default shell (desktop) with our own interface so that when the interviewers switch on their they will go straight to the case management system. We will switch off access to a pointing device and prevent interviewers closing or minimising windows.

In future years we would like to incorporate access to wordprocessing software or other windows options into the case management shell so that the interviewers can use some Windows applications but under controlled conditions.

Blaise 4 Windows

We plan to carry out some usability trials based on comments made by the interviewers: we will compare different colours and font sizes in the screen design and look at whether choosing from menus can be used during the interview and at home.

We will need to check that the decisions made on function keys, fonts etc. made for B4W are also carried through in the surrounding laptop systems, such as the case management system.

When decisions have been made on the various options, standard configuration files will be constructed and these will be used by all questionnaire developers to ensure consistency for all interviewers and surveys.

Interviewer Training

In the next few months we hope to carry out an experiment to compare different training methods and materials with small groups of interviewers. Depending on the resources available we would like to compare groups receiving

- No training, and
- Basic training – template of function keys; short note on changes

against one or more of the following

- On-line tutorial
- Audio tutorial
- Video training package.

After completing the training at home, the interviewers would complete a mock interview (via audio or video tape or over the telephone, as yet undecided) and the resulting interview would be transmitted back to the office. B4W has the facility to allow an audit trail of the interview so that the keystrokes and functions that are used by the interviewer can be recorded and analysed. The length of the interview and time spent in various sections of the interview or using certain functions can be examined; also whether particular functions were used and how successful interviewers were in using them. The outcome measures proposed by Shneiderman (1992) may be used.

Ideally, these interviewers would then be invited to headquarters so that they could complete some more interviews and be examined in person, or even videoed so that further analysis could be completed later and interviews compared.

By comparing interviewers who receive no training, basic training and some more complex training package we can evaluate the outcomes against costs and ask interviewers which methods they prefer. We may find that interviewers are able to pick up on changes to the software with no training at all but that it has an impact on confidence or that interviewers receiving advanced training show no difference in outcomes from those receiving basic training (at much less cost).

7. Summary

Despite applying usability principles and guidelines on rather a modest scale in comparison to some other organisations, ONS has already found them to provide a valuable framework for evaluating the move from a DOS to Windows based environment for interviewing.

In the next few months, we will proceed with our evaluation and carry out some small scale usability trials. We hope also to expand our testing to include the whole interviewing system, rather than just B4W. It is of little relevance to interviewers to know that they are using three or four different software applications in order to complete their interviewing task: they are simply using a laptop and software to carry out an interview and enter data.

It is our task to make the interviewing process as easy as possible for interviewers: we hope to achieve that task by continuing to be guided by usability principles.

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