Developing and updating screen layout and design standards

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1. Introduction

The importance of computer assisted interviewing (CAI) screen layout and design on interviewers performance in collecting quality data is now widely accepted and documented. The screen layout and design should enable interviewers to navigate quickly and easily around a questionnaire and provide them with an immediate and clear recognition of the task they need to perform.

In the mid-1990s Social Survey Division (SSD) of the Office for National Statistics (ONS) first developed a set of screen standards for Blaise for the organisation. A standard configuration file, based on these standards, was produced for use by all questionnaire developers. This standard configuration file was revised when ONS moved to a windows version of Blaise (B4W).

Screen layout and design standards need to be reviewed regularly both to take advantage of any advances in Blaise and to provide standards for new computer assisted interviewing (CAI) techniques, such as Audio-CASI. ONS are currently carrying out a review of their screen standards.

The aim of this paper is to provide a practical documentary of each stage of this process; it is not to describe screen design or layout guidelines that have not been suggested elsewhere. This paper may be helpful to other organisations that are about to start or are in the process of updating their own screen standards.

Throughout this process we have drawn on the work of other organisations. We have found the research carried out by Survey Research Center, University of Michigan particularly valuable.

2. Background

The collection of good quality data should be the key objective of any survey organisation. Interviewers play a major role in helping to meet this objective. Their primary goal is to collect accurate information, quickly and easily and to enter that information into the Blaise questionnaire. Couper (1994) remarks that the potential that interviewers have to impact the data collection process (in terms of both costs and errors), makes it imperative to design systems to maximise interviewer efficiency and minimise errors.

Blaise developers therefore have a responsibility to provide the tools to enable interviewers to meet their goal. It is essential that we help the interviewer in any way possible to do their job well. Interviewers need to be kept happy, the questionnaire should be a 'pleasing tool' to work with and should not hinder them in anyway. This is especially important at a time when maintaining survey response is a particular problem. Kuusela (1995) suggests that the user interface should be transparent so that an interviewer does not notice she or he is using it. This means that using it must be easy.

3. Importance of screen standards

Most organisations who develop CAI instruments have now developed their own set of screen standards or guidelines. The scope or main objectives of these standards may vary across organisations. For ONS, the objectives of screen standards are as follows.

- Provide a uniform interface. Interviewers can expect that instructions will always be in the same location on the screen. This means that interviewers can concentrate on interviewing, building a rapport and maintaining eye contact with the respondent.
- Simplify the programming task for developers because decisions about screen design have already been made. This is especially important in ONS where designers of questionnaires are researchers working on projects rather than a dedicated team of programmers.
- Make checking the questionnaire easier.
- Ensure that optimum standards (i.e. tried and tested) are being used.

4. Procedure for updating screen layout and design standards

The remainder of this paper will provide a documentary of the steps that have already been taken, or we plan to take, at ONS to review and update our current screen standards.

General principles

Before starting this process we developed the following list of key principles. We kept these principles in mind throughout the process.

- Use Blaise defaults and standardise as much as possible within the standard configuration file.
- Keep the number of standards to a minimum and the standards themselves as simple as possible. The implementation of standards should not increase the time taken to develop a Blaise questionnaire. It is desirable that the time should be reduced.
- The standards should be intuitive or easily memorable to enable new interviewers to become accustomed to the new conventions.
- Do not use Blaise features just because they are available.
- Any standard should be tested within ONS before it is introduced.
- Ensure that interviewers who are colour blind can benefit from the screen design standards. Rigden (1999) suggests that in good design, colour should never be the primary cue for information.

Stage 1: Review Blaise usage and new capabilities of Blaise

The aim of this first stage was to identify the following gaps and opportunities.

- CAI techniques that are now being used in ONS for which standards have not yet been documented.
- Existing question types or interviewing methods for which there are no standards.

- New Blaise capabilities that could enhance the current screen layout or design, such as symbols and the more flexible use of coloured text and font types.

- Changes to default settings between versions of Blaise, for example the default setting for a 'hard space' changed between Blaise 4.2 and 4.3.

- Facilities available in Blaise which are not currently being used because a decision has been actively made not to or time has not been available to investigate their use. Some examples that ONS identified were:

  - allowing interviewers to use a mouse to move around the questionnaire,

  - a more systematic use of 'NEWPAGE' to separate questions, and

  - the use of more meaningful extended field descriptions which could be used on screen and in data files rather than field names.

Stage 2: Literature review and experience of other organisations

The next step was to gather information about optimum screen design from variety of sources. We reviewed recent papers and articles and drew together information gathered from workshops and other organisations. One of the most productive tasks for us was to review standards set by other organisations. Using other people's standards is efficient; it is not necessary to spend time discovering for yourself what has already been discovered by others. If it has been tried and tested by others and it meets your needs then use it.

Stage 3: Feedback from users

For this particular review, we collected feedback from the field managers, who have daily contact with interviewers. The feedback they were able to provide was fairly limited. We feel a more productive method would be to seek feedback directly from interviewers on an ongoing basis.

With this is in mind, we would suggest that feedback is actively encouraged during the first few months after implementation of new standards. After this point interviewers will probably have got used to how the screen looks and become too familiar with the questionnaire(s) to be sufficiently annoyed or hindered to provide feedback. For example, on the first few interviews, an interviewer may have missed an onscreen instruction; this problem might be forgotten by the time that they have reached the tenth interview.

Stage 4: Proposed changes to screen layout and design standards

The next stage was to develop a list of proposed changes to the current screen standards. Examples of some of our proposed additions and changes to the existing standards are detailed in the following section.

Examples of new additional standards

- Concurrent interviewing

Concurrent interviewing is carried out on three of the ONS continuous surveys and enables the interviewer to ask a series of questions to more than one person at a time. Interviewers can potentially be interviewing up to the maximum number of respondents in a household, which is 14 for these surveys. Such large households are rare; it is quite common, however, to need to interview 3 or 4 respondents in a household. Interviewers switch between addressing sets of questions to one

respondent and then another. Screen standards for this technique have evolved since the move to CAI but have never been documented or reviewed.

Feedback from interviewers suggests that they have a problem knowing exactly when they should switch between respondents while carrying out a concurrent interview. The switch is, of course, programmed in Blaise, but the interviewer gets no warning to address a different person in the real world except a change in the respondent's name at the top of the screen. Interviewers need a more eye-catching method to tell them they should be turning to the next respondent.

The proposed solution is to change the colour of the question text for each person in the household. For example, the question text for the first respondent would be black, the second red and the third blue, the forth would revert to black. This solution has already been used successfully on one continuous survey carried out by ONS. Interviewer feedback suggests that this does provide them with the immediate indication they need to prompt them to move to the next person in the household. To ensure that this standard is also helpful for interviewers who are colour blind we also change both the colour and font type. The technique of changing font type will be tested before it is adopted as standard. (*Appendix A)*

- Text Substitution (Text fills)

There are currently no documented standards to specify the extent to which text fills can be used in ONS Blaise questionnaires. However, the developing ONS standard is only to use text fills where a clear case can be made that the pre-CAI method of relying on interviewers to remember information or to provide the appropriate variations can be improved on. For example, we think there is a clear case for displaying information such as the respondent's name on every screen; to carry forward responses from previous questions if that is needed; and to display dates in question text. Unlike many others, we see no case for routinely changing pronouns to agree with the respondent's gender. We only make very limited use of text fills to vary verb tenses. We would do this only for special circumstances where (a) it is essential to a distinction that is being measured and (b) would be ambiguous which tense should be used despite the context of preceding questions.

In our view, there are these arguments against the extensive use of text fills.

- Using text fills increases the complexity of the Blaise programme and so increases the risk of errors (and so development and testing time) without a sufficient benefit.
- What appears in any document produced via electronic documentation software is the text fill rather than the text that the fill represents. This means that the main users of these versions of the questionnaire (customers and interviewers) would not be able to understand the document unless it was manually edited.
- ONS interviewers are trained to be flexible and to deal with text fills. We think it is important to allow interviewers to be actively engaged in the interview and not to be encouraged to slip into a robotic role.

Other organisations do make more use of text fills and some have 'text fill libraries'. We feel that further research is required to justify using text fills more extensively (for example, does the use of text fills improve the quality of the data?). We hope to carry out such a project in the future, hopefully before the next revision of the standards.

- Audio-CASI

Audio-CASI was first used in ONS in March 2001. The current ONS screen standards do not include any guidance on screen layout and design when using audio-CASI.

Screen design is particularly important when using audio-CASI because the end user of the Blaise questionnaire is the respondent. Respondents will have a range of experience using computers so the questionnaire should be easy to understand and complete. Poor design should not provide an excuse to respondents to refuse.

The following standards are based on work carried out before audio-CASI was first used in production in ONS.

Screen layout
The following guidelines were followed when setting the screen layout standards:
- the screen should be kept uncluttered to avoid distracting the respondent.
- question text should not be displayed on screen. It is more important for the respondent to concentrate on listening to the question (this is especially important for young people who had reading difficulties).
- response categories can be displayed in the answer list section of the infopane in the standard way.

Flexibility to switch interviewing technique
In an audio-CASI interview the option should be available for the questionnaire to be completed using CASI or as a face to face interview (e.g. if the respondent preferred to do it that way or got into difficulties). To achieve this, we need a simple way to switch between the modes. We have found that using the colour contrast of foreground and background colours provides a simple mechanism. If audio-CASI is to be used the text of the question should be set to the same colour as the screen background. This has the effect of making it invisible, so that the respondent is not distracted from listening to the text (as noted above). For usual CAI or CASI the question text should be set to a contrasting colour so it can be read. More detailed instructions of how this is programmed in the Blaise questionnaire will be included in the ONS standards. A copy is also provided as an appendix to this paper. (*Appendix B)*

Even if the questionnaire is completed using audio-CASI it should still be possible for interviewers to be able to recognise the respondent's whereabouts in the questionnaire. A small identifier should be displayed. It is obviously important not to use an identifier that could distract the respondent such as the question number or "question 1 of 250". The questionnaire variable name may be the most appropriate identifier if it is not itself a mystifying mnemonic.

Labelled keys
We find it helps if the main navigational keys are colour coded, e.g. using paper stickers. Our standard is that the <ENTER> key is labelled white and the <F10> key, which we assign as the repeat key, is blue. Blue and white have been assigned to the two navigational keys because they are the least likely to be confused by people who are colour blind.

Examples of proposed changes to ONS standards

The following are examples of revisions we are currently proposing to the ONS standards following a review of some 5 years' experience and information gathered from other sources.

- *Question text format*
    - default font size for question text was increased from 10pt to 12 pt, to improve readability
    - any text which is read aloud by an interviewer should be immediately identifiable: we have opted for bold text,
    - likewise an optional text should be immediately identifiable but should not interfere with the compulsory text: based on work by other organisations our choice is grey text.

    (Appendix C)

- *Response categories*
  Lists of response categories should be kept to one column for up to eight categories; otherwise the categories should be balanced across the screen to avoid the interviewer missing categories.

- *Interviewer instructions*

  Interviewer instructions are currently identified using; 'INTERVIEWER:' followed by the instruction in capitals. It is generally accepted that reading text displayed in mixed upper and lower case letters is faster and easier (Tickner 1963). Hill (1999) explains that this increase in speed is due to a person's tendency to recognise the shape of the word as opposed to each individual letter in a word. When text is in upper case letters, it takes away the characteristic shape of words. The reader is forced to identify the individual letters of each word, which slows the reader down.

  Now that an alternative method of highlighting instructions (i.e. colour) is available, we were particularly anxious to change our current standard for interviewer instructions.

  Interviewer instructions will now be identified using the following symbol ⓘ ('i' in Webdings pt 16) in red text. The instruction text should be written using 11pt in Comic sans serif (red).

- Current standard:

INTERVIEWER: ENTER TO THE NEAREST £1 (AFTER HOUSING BENEFIT)

- Proposed standard (in red text):

ⓘ   Enter to the nearest £1 (after housing benefit)

- *Standard action instructions*

  Instructions which are telling interviewers to carry out a task, rather than providing them with additional instructions, will be formatted in the same way as interviewer instructions (i.e. red text, mixed case and in font type, comic sans serif).). The key action only will be written in capitals. This format has been chosen because we want to draw the interviewers attention to the action that they should take. Some examples:

  CODE all that apply
  to SAVE enter [Alt+S]
  to EDIT enter [insert]

- *Symbols*

  In the current standards show cards and interviewer instructions are identified by 'SHOW CARD and 'INTERVIEWER INSTRUCTION'. Opinion questions are currently identified by [*]. As mentioned previously, we were anxious to avoid using capital letters wherever possible. Symbols take up less room on screen and are more immediately identifiable than capital letters.

  The following symbols will be used to represent a show card, interviewer instruction and an opinion question.

Show card	◉	(webding, 20pt, red)
Interviewer instruction	ⓘ	(webding, 18pt, red)
Opinion question	★	(monotype sorts, 14pt, red)

  (Appendix D)

- *Colour Scheme*

  The colours used for each part of the screen will be changed. The infopane will be a pale yellow, the question information section a pale turquoise and the fieldpane a pale blue. The main reason for this change is to create more contrast between the formpane background and the fieldname text. The current standard is to set the formpane background colour to royal blue and interviewers have commented that they find it difficult to read the fieldnames. *(Appendix E)*

Stage 7: Testing

One of our key principles at ONS is that any proposed screen layout and design changes should be tested within ONS before being introduced.

Before testing started we created a test questionnaire which included examples of all question types. The standard Modelib file was also revised.

Testing of the new screen layout and design standards will be carried out in the following three main stages (stages one and two have been completed):

- Expert review

A small group of people who have a good knowledge of Blaise and Field Co-ordinator (an 'expert user') in ONS were asked to comment on the new screen standards. The screen layouts and designs were amended to incorporate comments their comments and the test questionnaire was prepared for the second stage of testing.

- 'Walkthrough tests'

This stage involved a small group of users (Field managers, experienced and inexperienced interviewers (Face to Face and Telephone interviewers). The testing is taking place in three main stages:

1. Problems with current screen:
Before revealing the proposed changes to the screen layouts, I asked the interviewers whether the current screen layout and designs caused them problems. Interviewers provided the following comments:

'it is sometime difficult to distinguish between instructions and question text, it would be nice to have them in different colours'

'the space between question and instructions is important'

'some newer interviewers read through the question mark, or stop too soon'
(the ONS standards is for interviewers to read to the question mark)

'lights and sun glare on the white screen, but get used to it'

'the empty questions at the bottom of the screen are sometimes daunting'

'I have trouble reading capitals and text is too small, especially the question names at the bottom of the screen'.

'I like the fact that all parts of the screen are different colours'.

2. Symbols
Interviewers were shown the range of symbols available in the Webding font type. They were asked to say which one they would choose to represent an interviewer instruction. All but one interviewer picked the 'ⓘ' symbol. Some comments were *'it's simple', 'striking', 'others are too childish', 'not too complicated', ' 'I' for information' and 'it stands out'.*

As the majority of the interviewers were telephone interviewers I did not ask them to pick a symbol for a showcard. However, as they were going through the questionnaire a couple of the interviewers commented that they felt the '👁' was appropriate to represent a showcard. One remarked that it said 'look at' to them.

3. Screen layout and design changes

The next stage was to as the interviewers go through the test questionnaire, they were encouraged to 'think aloud' and provide feedback as they did so.

Interviewers liked the new colour scheme, they found it: *'plain', 'clear', 'not glaring', 'soft on the eye' and 'more restful'*. All interviewers agreed that using red text for the interviewer instructions made them stand out more (*'it hits you'*) and they were easier to read. They were also positive about the use of bold for the question text, they agreed that it was a clear way to highlight text that should be read. One interviewer noticed that the question text was not extending all across the screen and felt it was an improvement.
Some general comments about the overall appearance of the screen were that they *'didn't feel bogged down by it'* and another said they thought it was *'user friendly'*.

- Final large scale test

This final stage of testing has not yet been started. We plan that this stage will involve experienced and inexperienced telephone and face to face interviewers. We will also include some interviewers with visual impairments and colour blindness. The testing will be carried out in a variety of environmental conditions (for example, inside and outside). Outcomes from this test will be evaluated and final changes made to the document detailing the proposed standards.

Stage 8: Finalise screen standards document

Once the changes to the standards have been agreed the next task will be to update the current standards document. The changes and additions will need to be disseminated to other Blaise developers within ONS. This will probably be done by holding a number of small workshops. The document and a summary of changes will also be circulated to all Blaise users in ONS.

Stage 9: Implementation of the new and revised standards

The final stage of the process will be implementation. The following steps will be taken to help smooth the transition from the old to new standards.

Tools for developers

At ONS we use standard blocks. These are comprised of harmonised modules of questions or standard code (for e.g. a block for the interviewer to record details about the administration of the interview, such as outcome and number of calls). Developers build their questionnaires using these standard blocks and blocks of survey specific questions. These standard blocks are revised on an annual basis and are ready for developers to include them on questionnaires for the beginning of April (although essential minor changes are made through out the year). The new standards will be incorporated into these blocks.

Some templates will also be developed for each type of question and interviewer instruction. These will be available to all developers so they can cut and paste them into their questionnaires and add the question text and response categories. The syntax to format the question in the correct way will already be there.

These templates may be particularly useful when developers are familiarising themselves with the changes. For example a template for a 'Running Prompt' question:

```
Fieldname "@/@/@b INSERT QUESTION TEXT HERE ...@b
          @/@/@rRunning prompt@r"

                :(LABEL 1    "@b RESPONSE 1,@b",
                  LABEL 2    "@b RESPONSE 1,@b",
                  LABEL 3    "@b RESPONSE 1?@b")
```

Timing of implementation

Ideally we would like to implement the standards at the same time for all surveys; this probably will not be possible. Most continuous ONS survey run to an annual cycle survey year beginning at the start of April (to match the UK financial year). Adhoc surveys can begin at any point in the year. As many surveys as possible will adopt the new standards at the beginning of the 2004 survey year (April). At this point all surveys will have moved to Blaise 4.6 and the new standards can be incorporated into the updated standards blocks.

Guidelines for interviewers and trainers

Before the new standards are introduced we will also produce some guidelines to explain the changes to interviewers. We will also write an instruction document for trainers of new interviewers.

5. For the future

Over the next few months we will need to take a closer look at Blaise 4.6 and identify any features that may further enhance screen layout or design. We will then move to the final stage of testing.

Once the changes have been finalised and implemented we will then start thinking about the future. One of the next major jobs for ONS will be to develop screen standards for web surveys. We may also investigate the necessity of tailoring CASI screen standards to the type of respondents, for example, older people, young people and children. Children are generally more experienced computer users than older people and so require fewer navigational aids than older people, but perhaps need a more visually exciting screen design to keep their interest.

Finally, based on our experience of updating and reviewing the screen layout and design standards, we would suggest that the process of reviewing and updating screen standards should be ongoing. We would also recommend that someone within an organisation be given responsibility for screen standards. Amongst other tasks they could keep up to date with current thinking on optimum screen standards and encourage and act upon feedback from interviewers.

6. References

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7. Appendices

Appendix A

- First person in household - question text is black

- Second person in household - question text is blue

- Third person in household - question text is green

Appendix B

The colour switch variable was set up as a parameter in the top-level block of the self-completion section of the questionnaire. Appropriate colours are assigned to 'W' and 'P' in the modelib editor. The parameter (PColour1 and PColour2 – see example below) was switched between '@W' or '@P' depending on the mode of completion.

```
C3G3  "^PColour1  Have you ever used glue, gas or
         solvents?@/
       PRESS 1 for NO, 2 for YES @/
       PRESS the WHITE key to continue@/ ^PColour1
       ^PColour2@/ Question G3 ^PColour2@/"
      MML "SOUND(C3G3.WAV)
           SOUND(Delay.WAV)
           SOUND(NoYes.WAV)
          SOUND(White.WAV)"
       : NY
```

Appendix C

- An example of the proposed format for displaying optional text

Blaise Data Entry - \\LSURVEY1\SQA\Projects\Usability\Test questionnaire\Blaise42\SQA101201

Forms Answer Navigate Help

SQA101201 | General_Blaise_Help |

After the baby was born did you have any help
around the house or with the baby, from ...

... your husband?

⊙ 1. Yes
○ 2. No

XWhyStop			Genhlth	1	Good
LastQual2	18		BabyHelp	1	
QualDesc	gcse		HelpDisp	1	Continue
LastQual4	18		HelpHus	1	Yes
VehWork	2	No	HelpRel	1	Yes
HowFeed	2	breast	HelpFrnd	1	Yes
NumAL	1	OneAL	HelpHome	1	Yes

4/7   Navigate   SQA101201 (HelpHus)

Blaise Data Entry - \\LSURVEY1\SQA\Projects\Usability\Test questionnaire\Blaise42\SQA101201

Forms Answer Navigate Help

SQA101201 | General_Blaise_Help |

(After the baby was born did you have any help
around the house or with the baby, from ...)

... other relatives?

⊙ 1. Yes
○ 2. No

XWhyStop			Genhlth	1	Good
LastQual2	18		BabyHelp	1	
QualDesc	gcse		HelpDisp	1	Continue
LastQual4	18		HelpHus	1	Yes
VehWork	2	No	HelpRel	1	Yes
HowFeed	2	breast	HelpFrnd	1	Yes
NumAL	1	OneAL	HelpHome	1	Yes

4/7   Navigate   SQA101201 (HelpRel)

Appendix D

- An example of an opinion question

- An example of a question with a showcard

Appendix E

- Current colour scheme

- Proposed new colour scheme