

# Developing A Web-Smartphone-Telephone Questionnaire

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This paper will explain how we implemented a web questionnaire that works on both PCs and tablets/Smartphones for the GUS project.

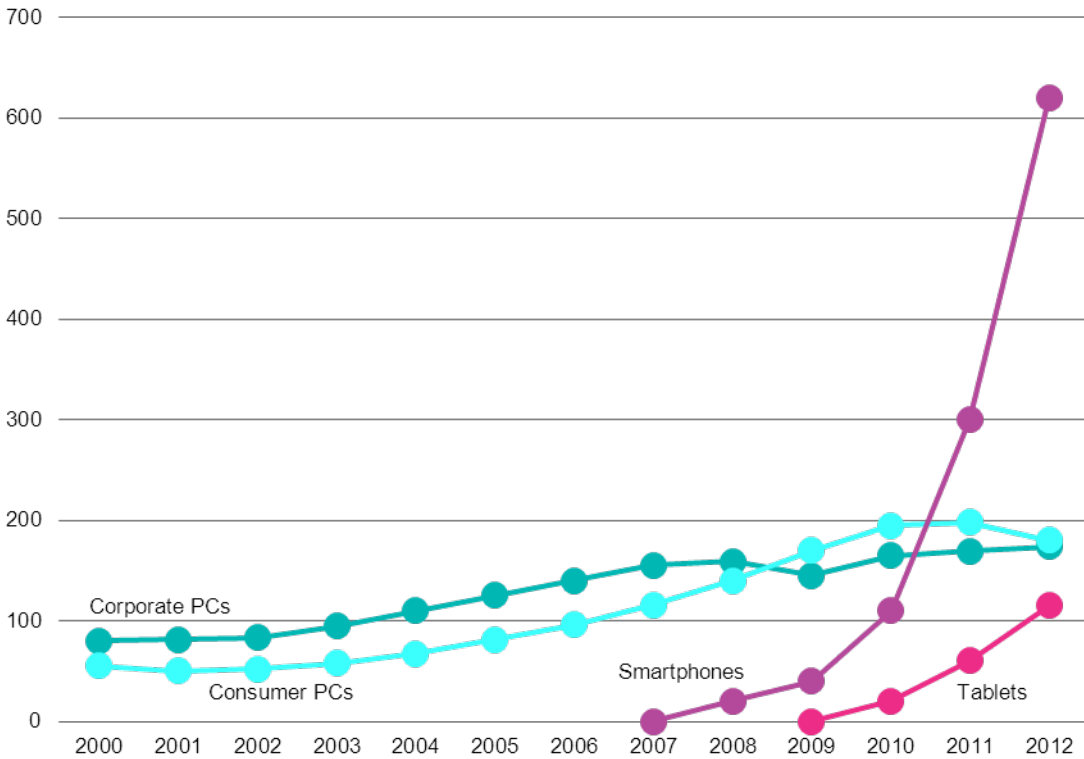
The Growing Up in Scotland (GUS) study is a major cohort study funded by the Scottish Government, following three groups of children through their early years, into childhood, adolescence and, possibly, beyond into adulthood. Seven waves with face to face interviewing have been completed so far, and the most recent wave was designed to be a short web questionnaire. We felt that this was an opportunity to develop a CAWI questionnaire using CentERdata's C-MoTo software to make it accessible from a smartphone or tablet as well as from a standard desktop or laptop computer.

C-MoTo makes it possible to create Blaise CAWI questionnaires that are suitable for mobile and touch devices. The C-MoTo questionnaire is user-friendly because the layout is automatically scaled to fit exactly on the device's screen. Also the user input is optimized by supporting automatic keyboard selection and gesture control. C-MoTo is available for free for non-commercial use.

## **1 Trends in annual sales of devices**

Sales of Corporate PCs have risen from around 90,000 per year in 2000 to around 190,000 per year in 2012 and sales of Consumer PCs have followed a similar trajectory. Although Smartphones were only introduced in 2007, their growth has dwarfed that of PCs, and stood at over 600,000 units per year in 2012. Tablets were introduced in 2009, and the rate of growth in their annual sales is faster than PCs. Tablets look like they will overtake sales of both corporate and consumer PCs by 2014.

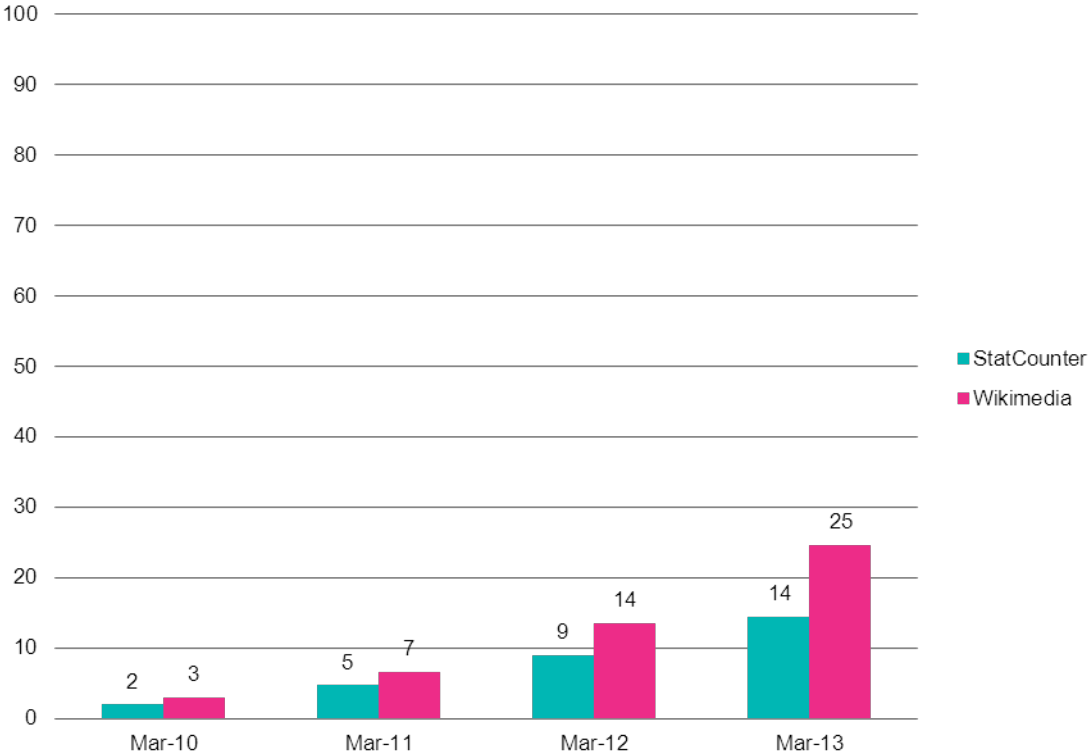
Figure 1. Global Annual Unit Sales



<sup>1</sup> Source: [www.slideshare.net/bge20/2013-05-bea](http://www.slideshare.net/bge20/2013-05-bea)

Also when you have a look at the percentage of web-traffic that origins from a mobile device, you see that since 2010 mobile devices are increasingly used to access the internet. Figure 2 shows the percentage of web traffic by mobile devices over time. One source is Wikimedia which measures the traffic of popular websites like Wikipedia and Wiktionary. The other source is StatCounter that tries to publish more global web usage statistics. Both statistics show a steady increase of mobile internet usage.

Figure 2. Percentage of mobile web use compared to all internet usage



## 2 Displaying a web questionnaire on different devices

The screenshot below shows a typical page from the standard GUS web survey when accessed from a PC. The type is large enough for people to read, and people can easily select the appropriate answer category and move to the next question.

ScotCen  
Social Research that works for society

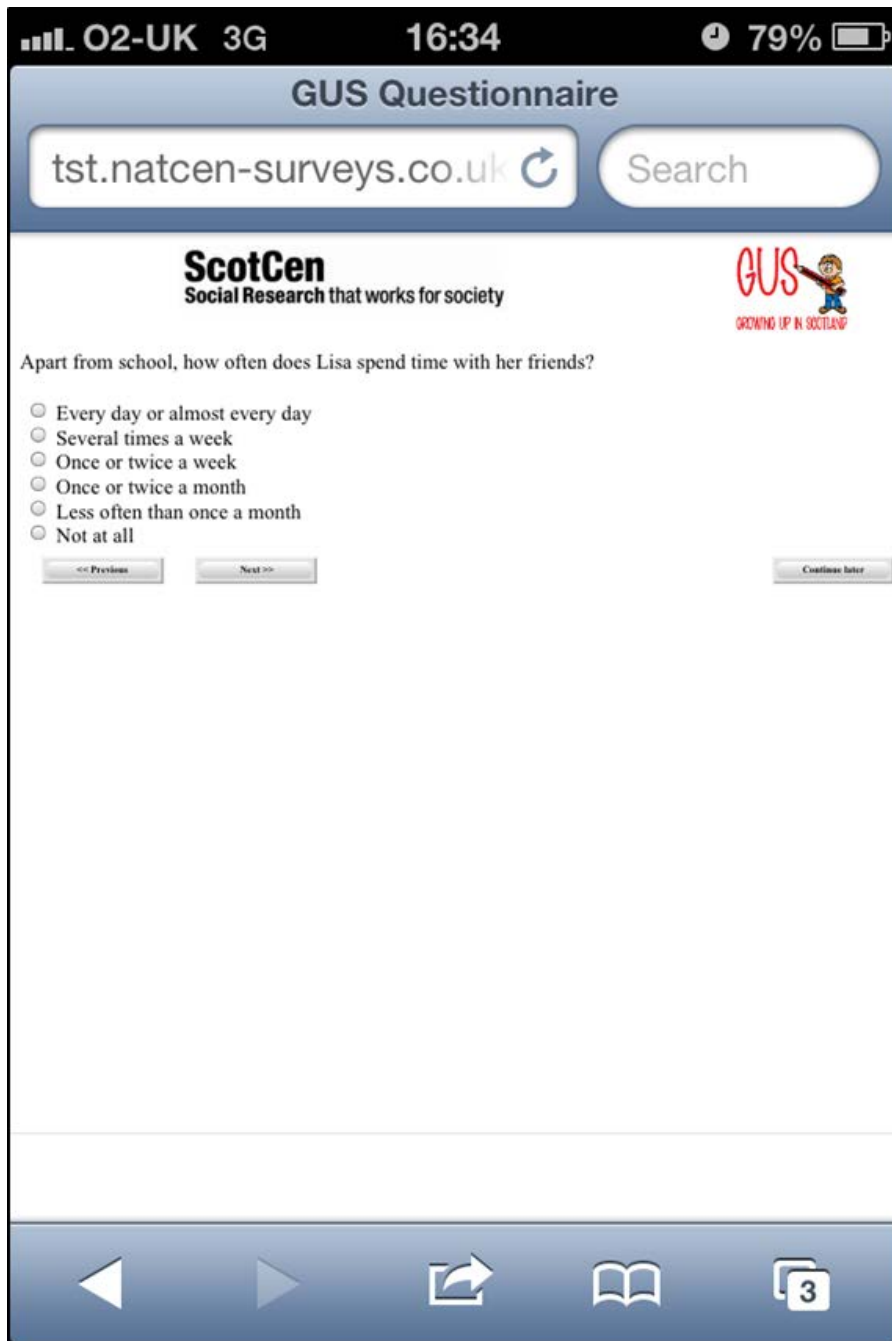
GUS  
GROWING UP IN SCOTLAND

I like to control what Bart does

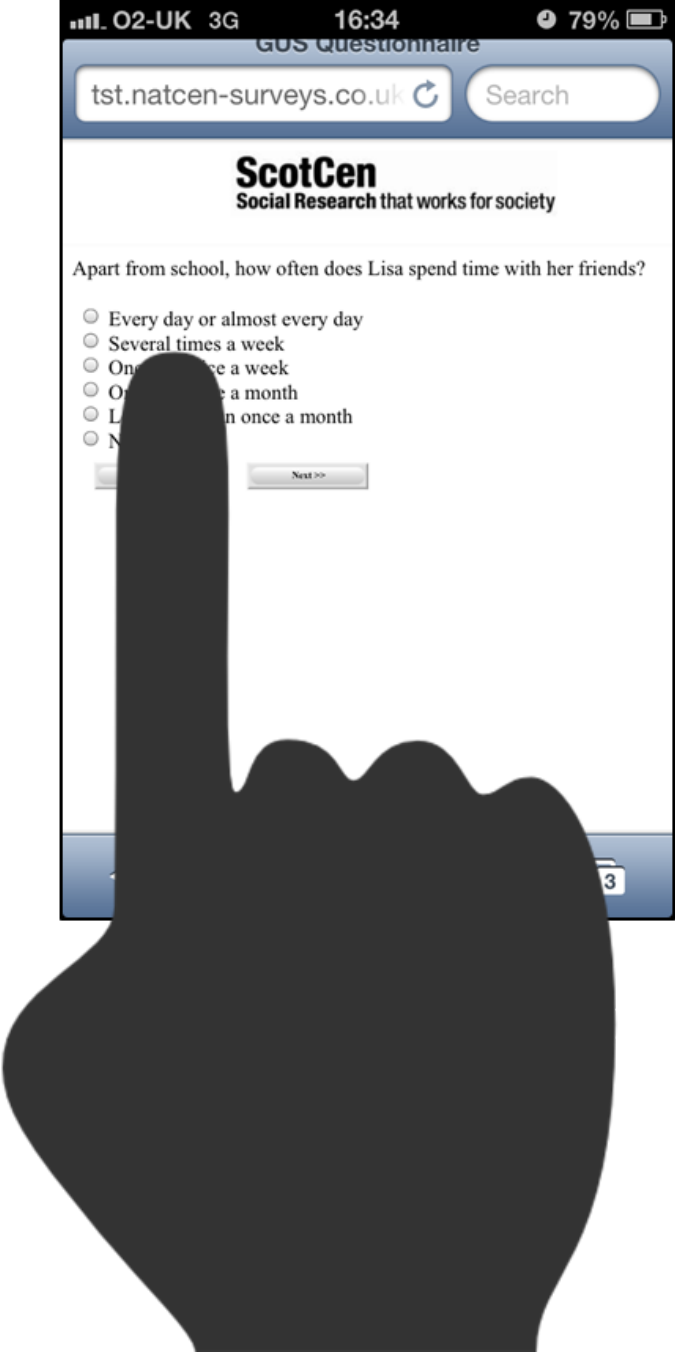
Not at all true  
 Somewhat untrue  
 Somewhat true  
 Very true

<< Previous      Next >>      Continue later

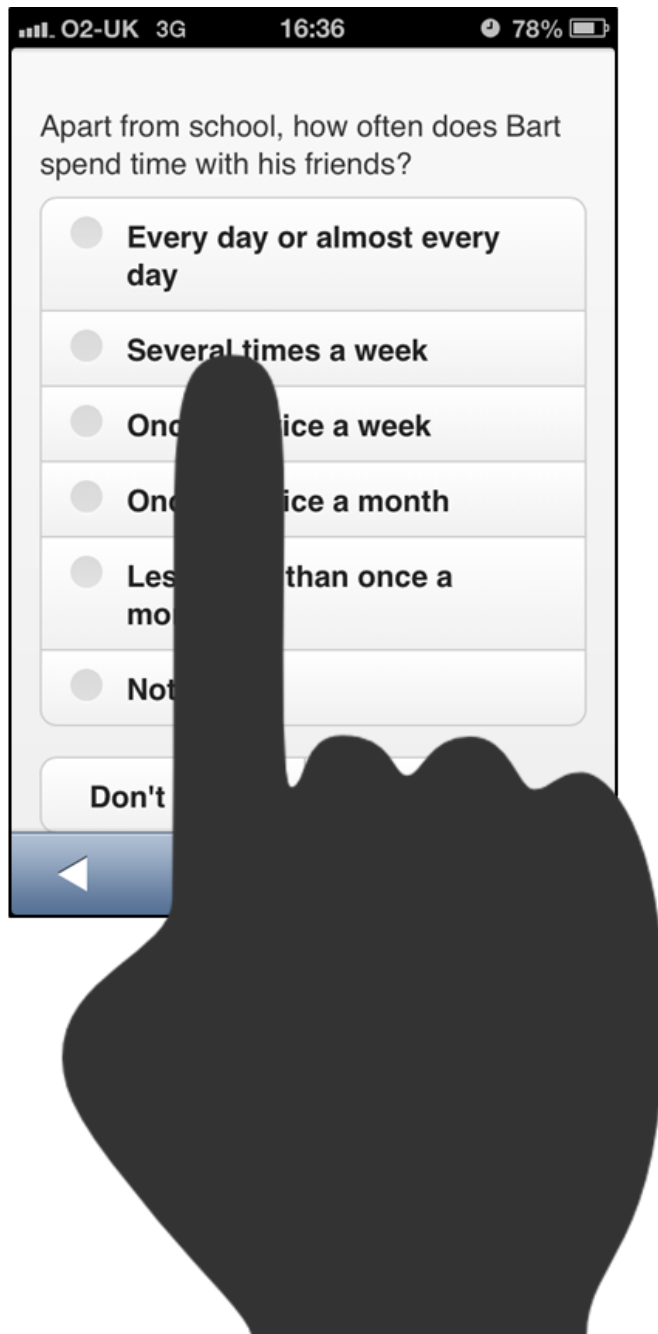
However, if the same questionnaire is accessed from a tablet or smartphone, then the text size is affected by the overall screen size of those devices. The C-MoTo software formats the questionnaire in a way that is much more suitable for a tablet or Smartphone user. The following screenshot on the left shows how the default Blaise web questionnaire displays on an iPhone, whereas the screenshot on the right shows the reformatted C-MoTo version.



We can see that the text for the default web format is much smaller and therefore harder to read. If a respondent pinches to zoom in, then although the text size increases, the question and answer texts do not wrap to the enlarged screen. In addition it is very difficult to select the appropriate answer because the radio buttons are small. Even when the user zooms in on the radio button in a traditional web questionnaire it is hard to select the correct one.



For this reason the complete area around the radio button in C-MoTo is clickable. This makes it much easier to select the correct answer.



The screenshot above shows how the questionnaire is formatted on a iPhone, but we also tested on Android phones and tablets and an iPad.

However, the C-Moto formatted questionnaire doesn't look good on a standard PC screen, so we had to design our questionnaire so that the format would vary according to the device used to connect to the

questionnaire, but that the data would be stored in one central database. The way that we did this is described in the following section.

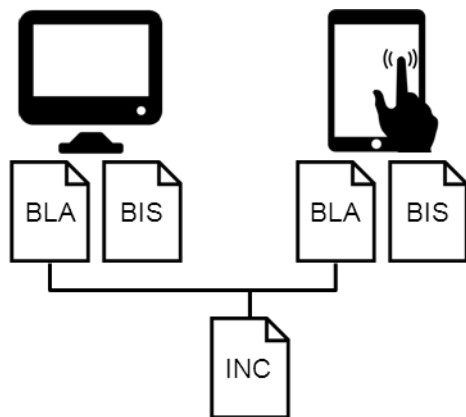
### 3 Designing a questionnaire to work in web and tablet modes

There were actually three modes that we need to take account of in the questionnaire design, as we needed a version of the questionnaire that could be accessed by our telephone interviewers for chasing incomplete questionnaires. From a design point of view, there is no difference between adding one additional mode and adding two additional modes, so for simplicity we focus purely on creating an instrument that would work in two modes: normal web and tablet/Smartphone.

#### 3.1 Two questionnaires with common source code

We planned to have one questionnaire datamodel with two different BIS files to generate the alternatively formatted versions of the questionnaire. However, in practice we found that we needed respondents to enter their access code after we had rerouted them to the device-specific questionnaire, which meant that we could not feed a parameter about the device type into the questionnaire. It may be that this could have been solved with more time, but the short development timetable meant that we went with a pragmatic solution rather than necessarily an optimal one. Therefore we needed to have two different datamodels with corresponding BIS files.

We wanted to avoid programming two instruments, so we structured our code so that we could use as much common code as possible, and so that the only difference between the two datamodels would be code contained in the top level BLA file. So there was a pair of BLA and BIS files for web mode and a pair of BLA and BIS files for tablet mode, and then common source code for each datamodel contained in numerous INC files.



The differences between the BLA files for different modes were minimal. There were 3 languages defined in both instruments as follows:

```
LANGUAGES =  
  Web  "Web",  
  Tab  "Tablet",  
  HLP  "Help"
```

The reason for having multiple languages was that there might have been occasions where we amended the question or answer text for tablet mode if either of these texts was too long. For a more general setup we would also probably have two separate help languages, but this was not necessary for this particular project.



The only differences between the BLA files were the datamodel name and the definition of Prepare Directives.

<b>Web .BLA</b>	<b>Tab .BLA</b>
DATAMODEL Web "WebQure"	DATAMODEL Tab "TabQure"
{'x-' if not used}	{'x-' if not used}
{\$DEFINE Web}	{\$DEFINE x-Web}
{\$DEFINE x-Tab}	{\$DEFINE Tab}

Each BLA file had a different datamodel name (web and tab for web-mode and tablet-mode respectively). Prepare Directives were defined differently in each BLA file – we used a convention of putting “x-“ before a Prepare Directive to switch it off, as there was no code in the body of the questionnaire that was enclosed within an “x-something” directive.

The only place where we actually ended up using Prepare Directives was in the global rules section:

```
RULES
  {$IFDEF Web}
    Device:=Web
    SetLang:=Web
  {$ENDIF}

  {$IFDEF Tab}
    Device:=Tab
    SetLang:=Tab
  {$ENDIF}

  SETLANGUAGE(SetLang)
```

This hardcoded the device type and language into each instrument. Ideally we would have only had one datamodel and passed these in as parameters, but because of the need to enter the access code on the page following the re-direction to the appropriate datamodel, it was not possible to implement this.

We set up the fields and rules for the rest of the questionnaire using common source code. This meant that the web and tablet versions of the questionnaire were compatible and so we could easily add them together.

### 3.2 Questionnaire Scripting Issues

The C-MoTo software uses the tags on field definitions to define how to display certain types of fields. So for example open fields need a textarea tag.

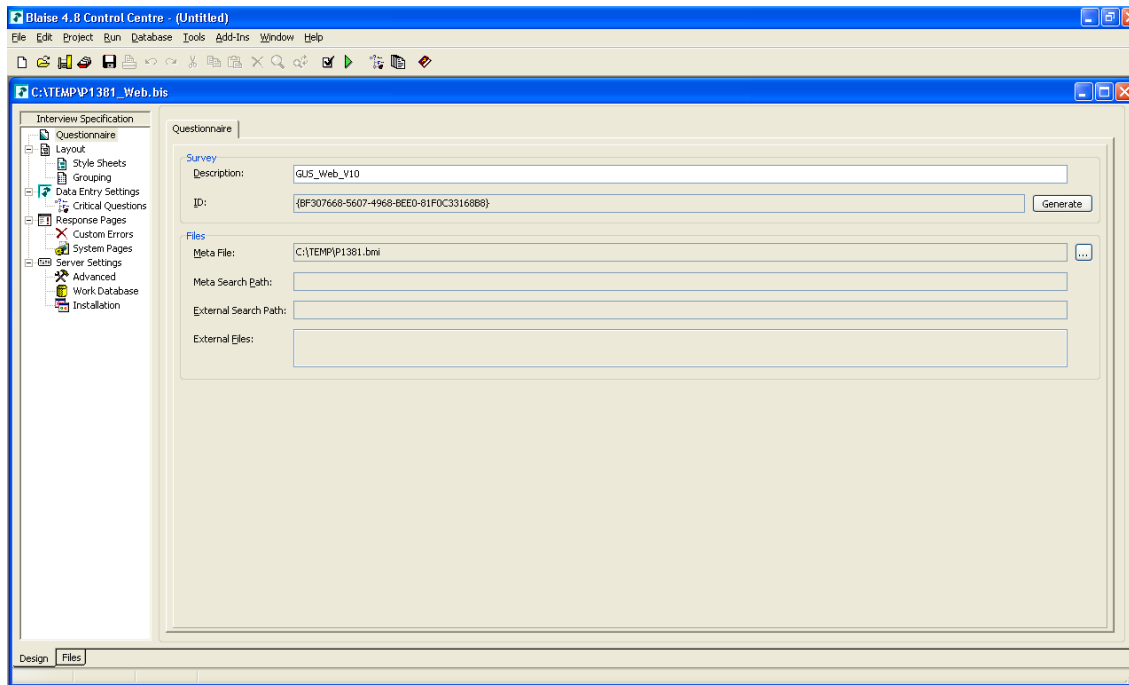
```
End1(textarea)
"Do you have any comments or feedback to give us on completing this
questionnaire?"
: TOpen
```

Datatype questions can have one of a series of date tags, depending on whether you want to use the default date picker for that device or a specifically designed one.

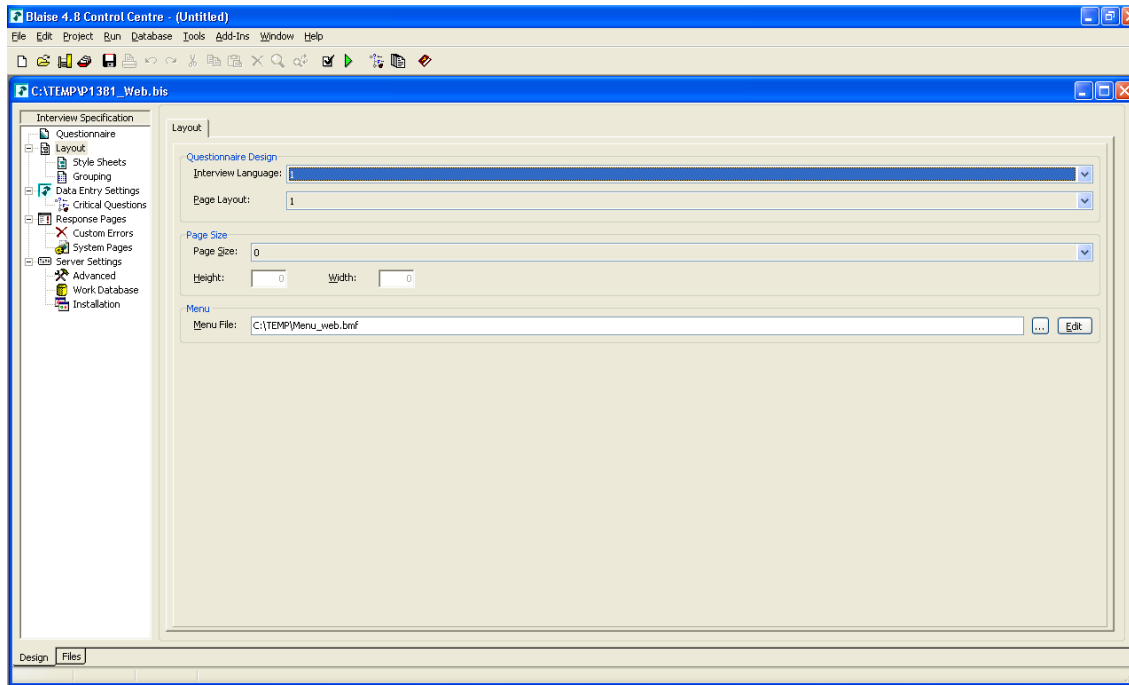
```
Pardob (datejq2)"
Please enter your date of birth
@#<br><br>@#Please enter this as DD/MM/YYYY e.g. 03/08/1975"
:DATETYPE
```

### 3.3 Two BIS files

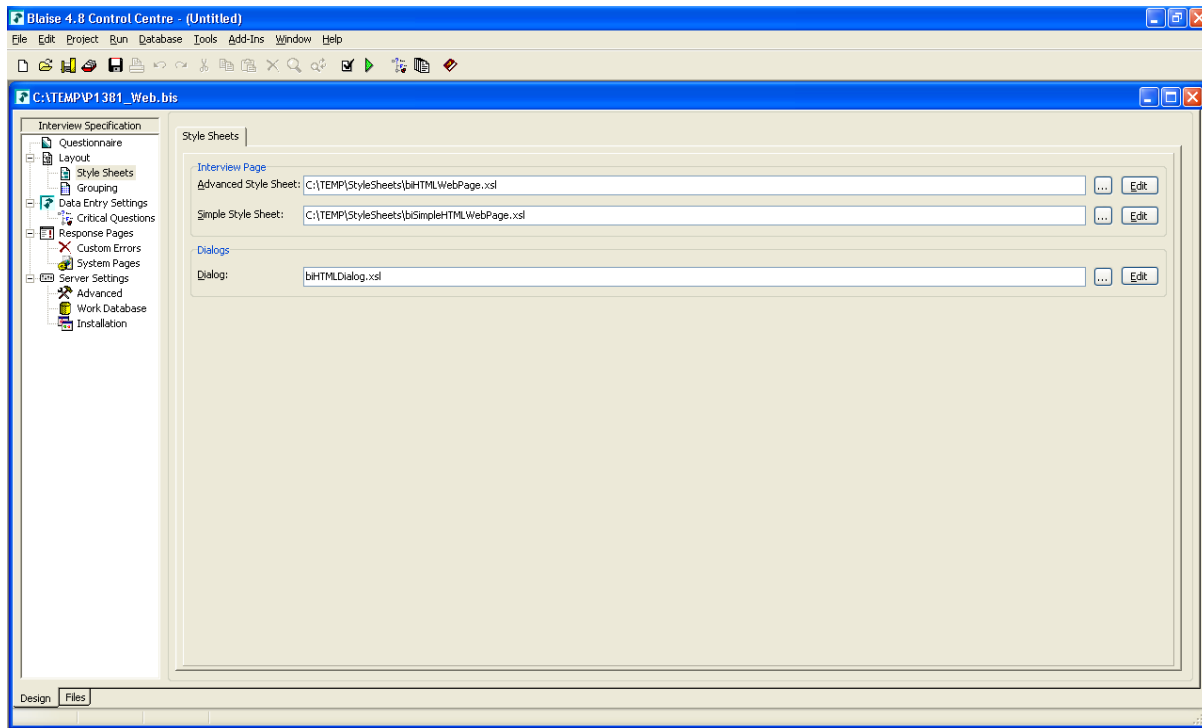
There were several places where the two versions of the BIS file differed. On the questionnaire section of the BIS file, the description and the meta file location were different. The description for web was “Gus\_web\_vxx” and it used the P1381.BMI meta file (this was the default meta file, but for future we would probably always use the \_web, \_tab notation. For tablet mode the description was “Gus\_tab\_vxx” and the meta file was P1381\_tab.BMI. The screenshot below and all subsequent screenshots are for the web version only to illustrate where these settings need to be amended.



There were slightly different versions of the Blaise Menu File. On the layout tab, the menu file for web is set to Menu\_web.BMF and is set to Menu\_tab.BMF for tablet mode.

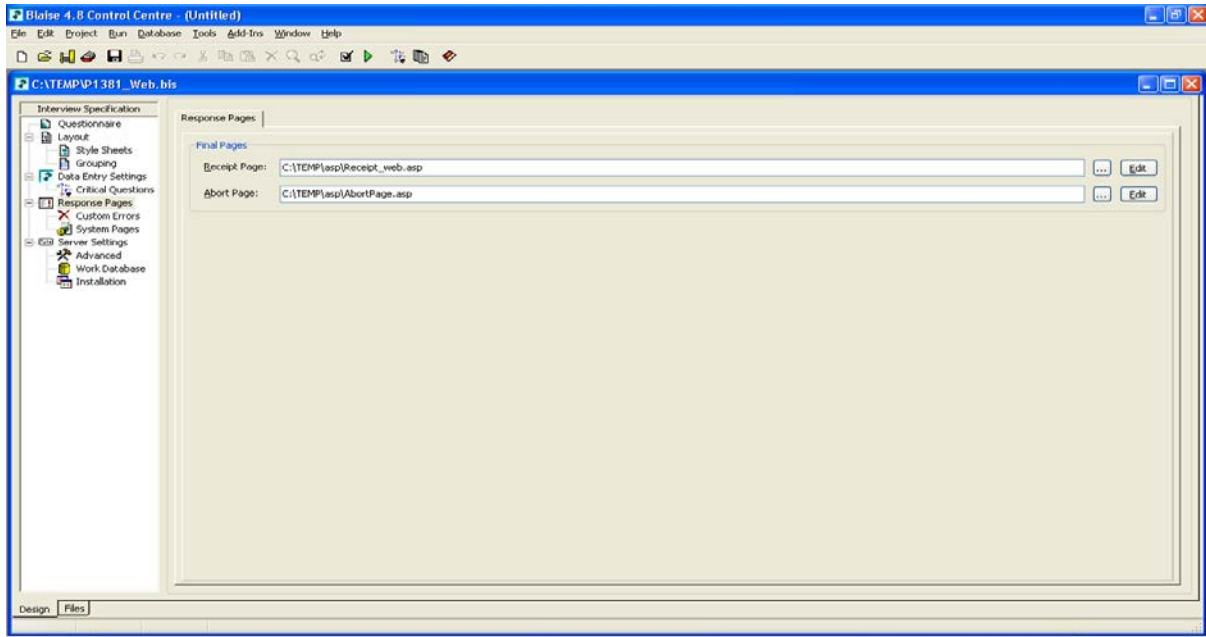


Style sheets for web were set to the Blaise defaults of biHTMLWebPage.xsl and biSimpleHTMLWebPage.xsl. There is one stylesheet for tab mode that replaces both of these – biMinimal.xsl. These are set in the Style Sheets tab.

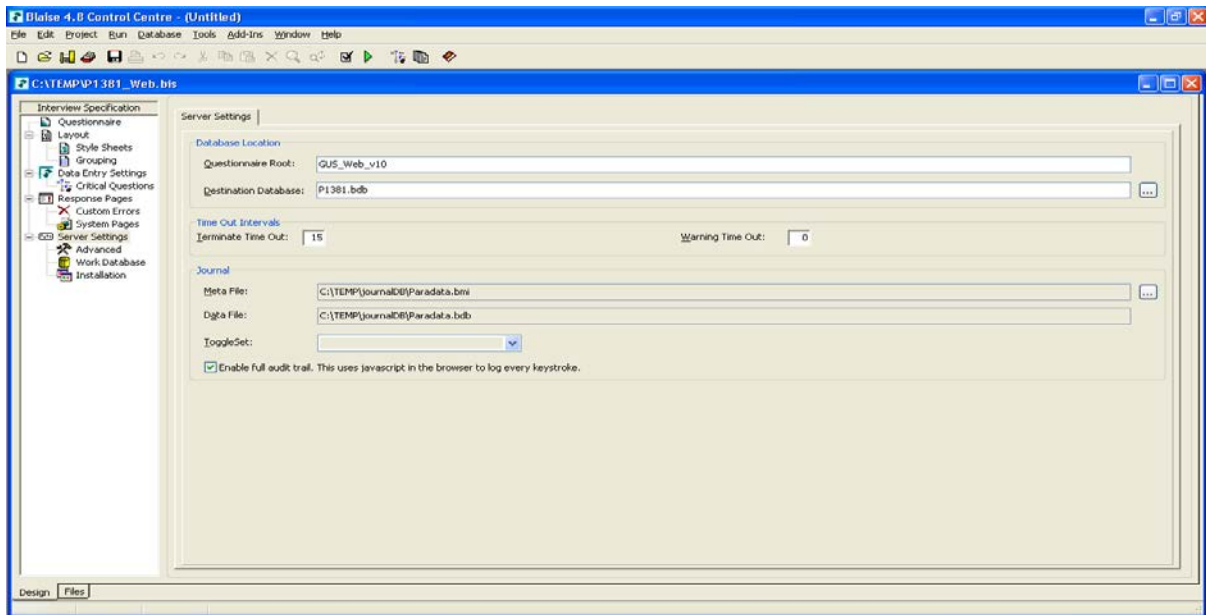


We deleted all groupings in the tablet version of the BIS file.

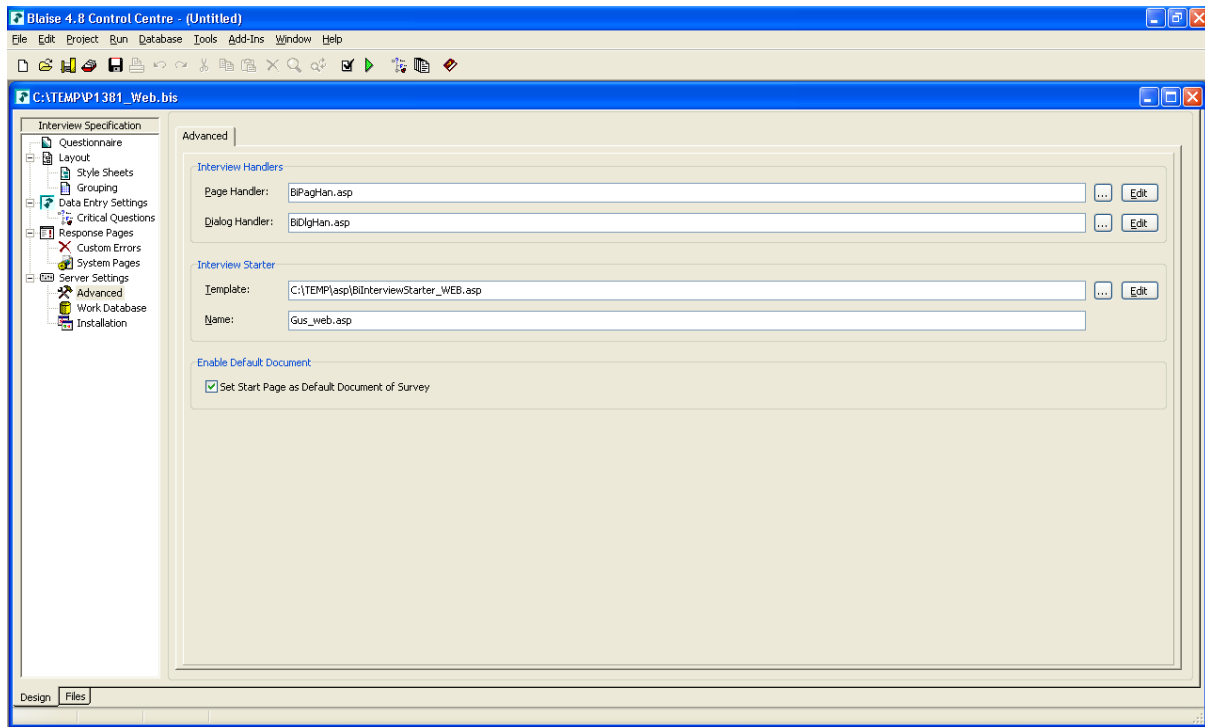
We had to create different versions of the receipt page for web and tablet to simplify the tablet version. These were set in the Response pages tab



A key difference was in the server setting tab. We had to set mode specific questionnaire roots, but we set the same default destination database for both modes as P1381.BDB (for the future this would be named xxx\_web.BDB). The reason for this is that this forces Blaise to create a BOI file for tablet mode when you install the survey on a web server host and then this BOI file can be redirected.

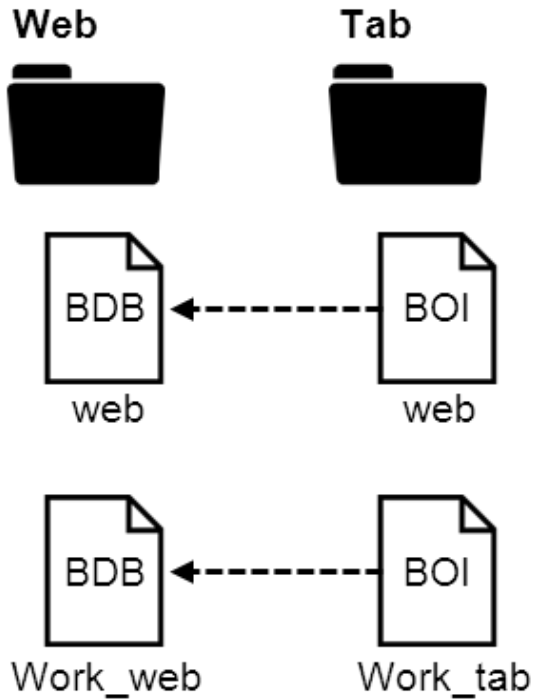


The last difference was that we had to create different starter pages for web and tablet mode so these were set in the advanced server settings tab. We amended the template starter to produce `_web` and `_tab` versions.



### 3.4 Installing the two datamodels

We had two datamodels and two BIP files created by compiling the BIS files, so we needed to install these on a webserver. Each datamodel/project is installed into a separate project directory, but then we amended the BOI files in the tablet mode so that they pointed to the completed and work BDB files in the web directory.

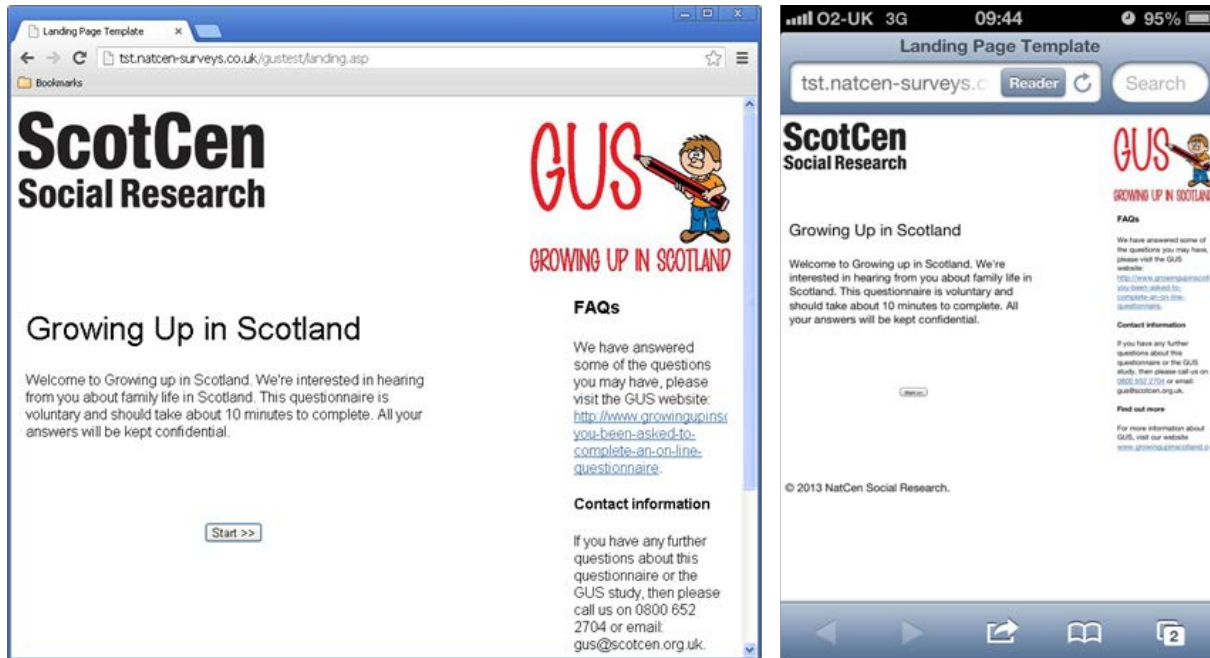


The only way that we were able to get this to work was to have set the tablet BIS file up so that it pointed to the web BDB file instead of the tab BDB file, and then this worked when we amended the location in the BOI file. This setup meant that respondents could access the questionnaire with one device, break off half way through, then reconnect with an alternative device and pick up from where they had previously got to.

During development it is very easy for installed versions to get out of sync, so the best thing to do is to make sure both datamodels are compiled, copy over any sample that is needed into the main web database, then install the web project, then the tablet project, then amend the BOI files.

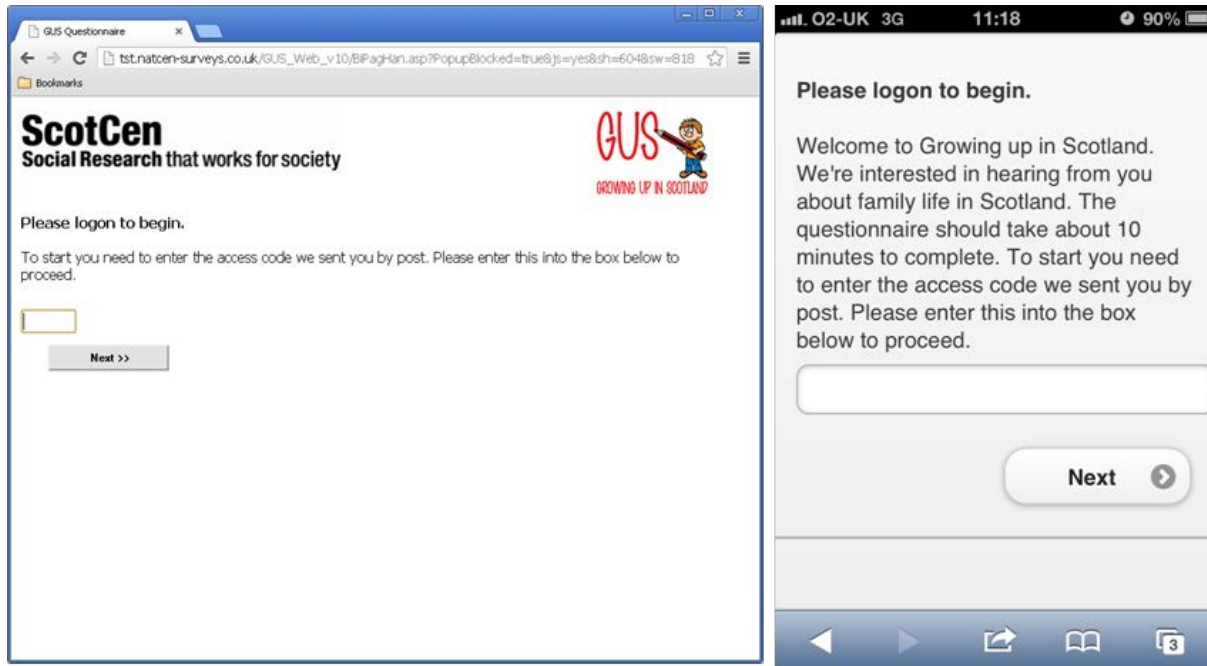
### 3.5 Landing page and re-direction

We decided that we would create one landing page for both device types which had a link to the GUS website and additional contact details. The screenshots below show how this displayed on a PC and iPhone screen respectively.



We added code behind the Start button which did the redirection to the appropriate device specific version of the questionnaire.

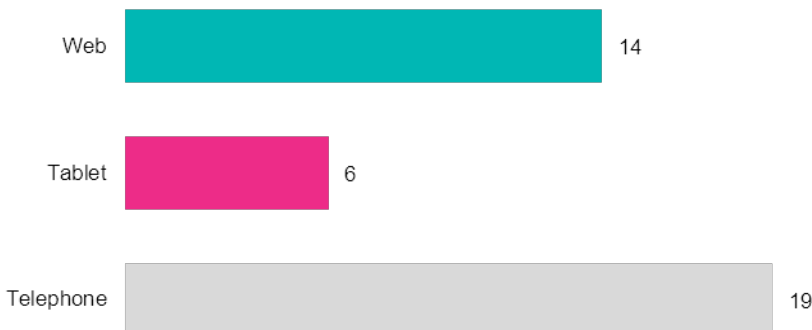
The access codes were entered as the first question in the questionnaire and hence the tablet version has the C-MoTo layout where the logos are stripped from the page, but we extended the text so that the first question wasn't too blunt.



#### 4 Numbers using each mode

The web and tablet versions of the GUS questionnaire were set up for the pilot, so we only have a small issued sample, but we will be able to judge the impact of offering a tablet friendly version at the main stage in September 2013.

Even give the small sample size the results are encouraging. 19 respondents were chased by the telephone unit (this was the third mode that we have ignored in the bulk of this paper). Of those who completed a questionnaire themselves 6 out of 20 used a tablet while 14 out of 20 used a PC (or Mac).



It is not possible to estimate the impact offering a tablet version had on response, except that we know that 6 people would have been directed to a page telling them that the survey was unavailable on a tablet or smartphone and would have been asked to connect from a PC instead. If these proportions are replicated on the main stage, then that would be a large proportion of respondents who would initially be discouraged when they attempted to complete a questionnaire.