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WAP Service Designer's Guide To Nokia Handsets

June 2000

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1. Introduction

1.1 Purpose

This guide provides information for developers of Wireless Application Protocol (WAP) services for Nokia mobile phone handsets. It gives general WAP service design advice, specific information on the Nokia WAP browser and Nokia handset user interfaces.

The guide is for use with the Nokia WAP Toolkit which offers developers an environment for creating, testing and demonstrating WAP services.

1.2 Nokia Handset WAP Feature Table

Feature	7110	6210 & 6250	Remarks
Display size	96x65 pixels	96x60 pixels	
Lines of text for data	4	4	Not including header & selection menu items
Scroll keys	Vertical scroll roller	Vertical scroll key	
Select key	Roller press	Send key	
Link from image	Not supported	Not supported	
Table columns	Not supported	Not supported	
Fonts available	8 pixel normal 8 pixel bold	8 pixel normal 8 pixel bold	
Image formats	WBMP	WBMP	WBMP =Wireless Bitmap
WML Version supported	V1.1	V1.1	WML = WAP Markup Language

1.3 References

The Nokia WAP Toolkit can be downloaded from http://www.forum.nokia.com/

With this software development kit you get the following on-line documentation:

- User's Guide
- Developer's Guide
- WAP Service Designer's Guide to Nokia Handsets (this document)

See also:

- WAP Forum Specifications at http://www.wapforum.org/
- Information about Nokia products can be obtained from http://www.nokia.com/
- User Guides for the Nokia 7110 and 6210

1.4 Contact information

Developer support can be obtained by sending an e-mail to wap.sw.developer@nokia.com.

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2. General Design Advice

WAP service design must be based on the mobile phone user's requirements. It must be simple to use, easy to learn, pleasant to view, and meet the user's needs for useful information in the mobile context. It is a good idea to imagine a typical mobile phone user and think about why, where, and how that person will use the service.

2.1 Service Design Attributes

Review your service against this checklist. The service must be:

- **Relevant:** The service must be relevant in the mobile context.
- **Integrated:** The service must complement your other customer services and alternative delivery media. It must not contain conflicting information or terminology.
- **Effective:** The information provided must be accurate and complete so that users achieve specified goals (for example, obtaining a specific share price from a stock exchange in a timely manner).
- **Efficient:** Time and cost to achieve a goal must be minimized (for example, the user makes only a few key presses to obtain some specific information).
- **Practical:** The constraints of a mobile phone and the environment in which the service will be used must be considered.
- **Satisfying:** The service must make users feel good about its use.

2.2 The Mobile Context

Consider what information might be relevant in the situations where the phone will be used. Mobile phones are generally used for data access when there is no access to the Internet via a personal computer.

Users of the mobile services will primarily be interested in brief and quick information. Access to transport schedules is a good example. Short news flashes are more relevant than longer news articles. Quick access to weather information may also be of use in the mobile situation. It is not likely that users will 'surf' with a mobile phone.

2.3 Service Integration

Most content providing organizations will be providing their mobile phone WAP services as extensions of existing commercial services, voice phone services, wired Internet web sites, and so on. Despite the limitations of phone displays and input capabilities, it is important that mobile phone services are integrated effectively into the total service. This may mean that some redesign of existing services is needed: for example, the use of shorter words to name options would be advantageous for mobile users and may not be disadvantageous if used in another medium.

2.4 Effectiveness

Accuracy and timeliness of information are important to people on the move. Yesterday's stock prices or airline delays are of no value to mobile users. Provide the important facts only. Background information is likely to make navigation more difficult.

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2.5 Efficiency

2.5.1 Navigation Forward/Back

Users should always have an easy way to step forward and back in the service. The user should always be able to cancel a command already chosen. This is particularly relevant in situations where users are merely curious to explore the service, and where they need an easy escape route.

2.5.2 Hierarchy

Keep the number of levels in the service hierarchy to a minimum. The more layers, the more complex navigation becomes. There is the risk that the user loses track of the starting point and experiences a loss of control. Most users like to have a ‘safe haven’ - a place that they are familiar with and that they recognize when navigating through cards. The further down in the hierarchy and away from the ‘safe haven’, the more the user will worry about how to get back to his ‘safe haven’.

2.5.3 Priority

Special attention should be paid to prioritizing the information shown on the hierarchy. Think about which information is most relevant in the mobile context.

2.5.4 Header Text

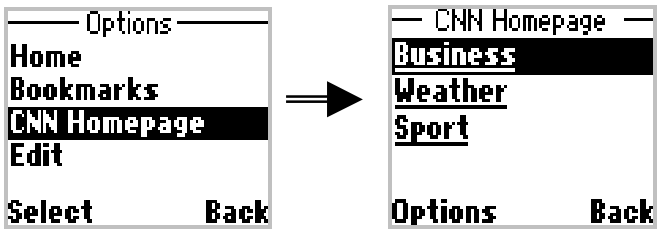
Header texts are card titles that help the user identify where they are in the service. The header text should be determined by the item previously selected by the user. Header text is automatically shortened (truncated) if it is too long to fit on one line in the display; so keep titles short.

2.5.5 Links

The link feature is well known from the Internet. Use multiple cards and links to prevent long pages of text. Links are shown as underlined text. Links are always displayed on a separate line in the browser.

2.5.6 Terminology

Keep terminology consistent. Avoid uncommon abbreviations. In the following example, the text *CNN Homepage* in the Options display is consistent with the header text in the second display.



2.5.7 Word Length

Use short words. Other than for header texts, word wrapping is used in displays. Hyphenation is not supported.

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2.5.8 Help Text

Help text should be relevant to a specific page. Do not put Help items in an Options list.

2.5.9 Text Length

Keep all text items as short as is practical. Only three or four lines can be viewed at a time. When scrolling, there is a risk that the user will loose track on the text page if the page is too long. Text items should be limited to roughly 15 lines.

2.5.10 Looping

When a list of items loop, the last item is automatically followed by the first item in the same list.

The following Nokia displays loop:

- Options list.

The following displays do not loop:

- Cards with text only, or cards with text and one or more links.
- Single selection lists.
- Multiple selection lists with mark/unmark.
- Cards containing only links.

2.5.11 Graphics

Use graphics to associate the mobile service with your service, organization, brand, etc. Also use them when they can present information in a more concise manner than text. But in general, the small screen size and slow data transfer speeds will restrict your use of pictures.

Use Wireless Bitmap (WBMP) file format for images. The Nokia WAP Toolkit has a WBMP Editor that can create, modify, and convert graphics from common WWW formats.

2.5.12 Clear Space

Avoid too much clear space between items and do not use blank cards.

2.6 Usability Testing

Always do usability tests of new services. People who have not been involved in the design or development of the services tend to notice potential usability problems often not obvious to those who know the design. Usability tests should always be performed as early as possible in the development process. Then, any necessary changes resulting from the tests can then be implemented within the development timescale. Recruit users who are representative of the end users of the service.

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3. Nokia Common Browser Features

3.1 Design Principles

The WAP browser user interface design reflects the Nokia 'look and feel' of the phone as used for voice communications and messaging.

The user interface elements used for WAP browsing are:

- Display screen for text and graphics
- Two selection keys with function name displayed above.
- Scroll – either by roller or by scroll up/down keys.
- Select – by roller press, by 'send' key or by menus & selection key.
- Input capability via text and number editors.

The left selection key is used to enter the menu structure and execute commands. The right selection key is used to exit the menu structure, cancel commands, and navigate back in history.

3.2 Phone User Interfaces

Nokia 7110 **Nokia 6210**

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3.3 Design Details

3.3.1 Display Fonts

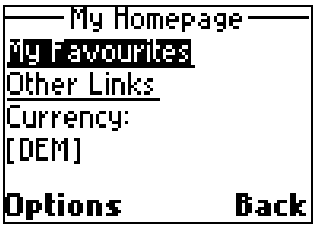
All fonts used are proportional fonts. Proportional fonts give a dynamic and minimized width for each character, improve readability, and generally allow more characters to be displayed per line.

Two fonts are used in the Nokia browser:

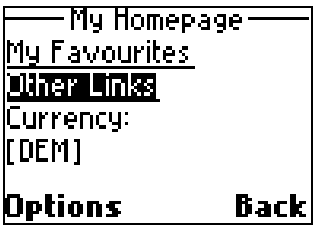
- 8 pixel normal (used for header texts)
- **8 pixel bold** (used for main text and selection-key texts).

3.3.2 Browser Display

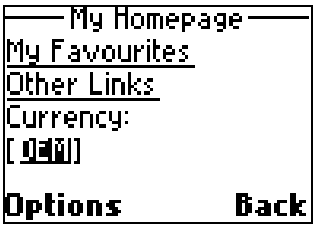
Links are shown as underlined text. The Header text (“My Homepage” in the display below) is specified by the `title` attribute in the WML card.



Inverse video is used to highlight the current selection. Scrolling down in the above example will give:

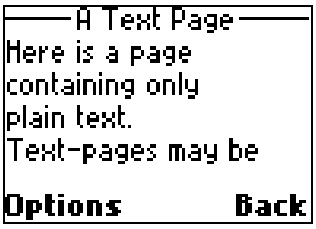


And scrolling down again gives:

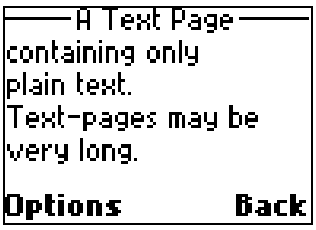


3.3.3 Scrolling In Text

Plain text is scrolled line by line. Example:



Scrolling down gives one extra line of the text:



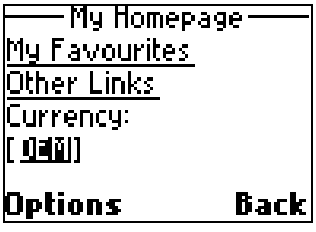
3.4 Left Selection Key Options

The left selection key will, in all normal browsing situations, contain ***Options***. The options list is a mixed list, containing both context-sensitive options (like all the Do-elements), and also 'fixed' browser options (Bookmark handling, etc). The contents and ordering of the options are:

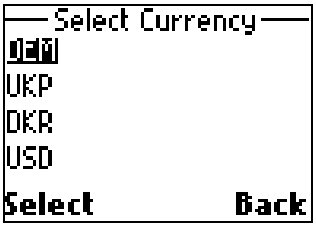
- **Home** (short-cut to the Home page)
- **Bookmarks** (see Section 3.9)
- **Select** or **Edit** (*Select* works as `go` -element for links and as select for selection lists or links; and works as 'Edit' for the `input` -element.)
- **do** element number 1 (provided by the WML Card, if available)
- **do** element number 2 (provided by the WML Card, if available)
- **do** element number X (provided by the WML Card, if available)
- **Use Number** (will allow the user to call (or edit) any of the numbers in the current card. Only available if there are numbers in the card. See also section 3.10 Use Number handling).
- **Empty Cache** (removes all cached WML Decks in the phone).
- **Exit** (exits the browser, ending up in the standby mode)

3.5 Single Selection Lists

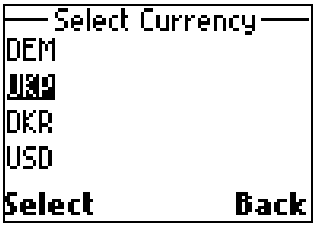
Single selection lists are shown by the default item (the **[DEM]** item below) being displayed between square brackets. Selecting this item is accomplished by pushing the phone's vertical scroll roller:



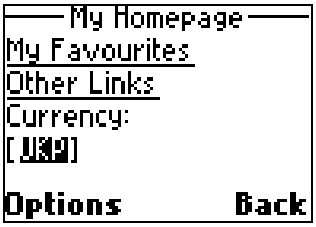
Selecting this item can also be accomplished by choosing the *Select* item from the ***Options*** on the left selection key. In both situations, the result would be:



Scrolling down one item in this list displays:



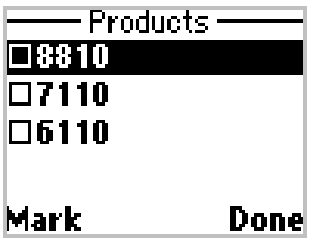
The user selects an item by pressing the vertical scroll roller or by choosing *Select*. In this case, the result would be entering the number editor (see Section 3.6.1) to input a currency value. Not selecting the item but instead choosing *Back* results in the following display:



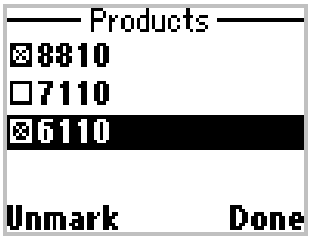
3.5.1 Multi-selection Lists

Nokia phone sets also support multi-selection lists, which are implemented in WML via the `option` element. The following display shows the start of a mult-selection list:

When the user selects the highlighted brackets, the items to be selected are displayed:



The user can select and deselect items from this list via the vertical scroll roller or by pressing the ***Mark***/***Unmark*** selection key:



The user can mark none, one, or several of the items in this list. When completed, the user presses the right selection key, ***Done***, and the previous Browser display returns with the new selections, as shown below. To execute the request, press the vertical scroll roller, or choose an option from the *Options* menu.

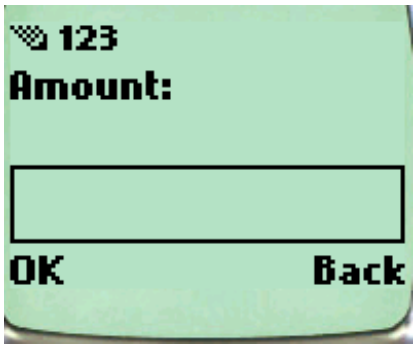
3.6 Editors

Nokia phones have three editors: (1) a number editor for entering numbers and phone numbers, (2) one for typing text (and numbers), and one for typing a password (number entry, but where the typing is displayed to the user using asterisks (*****).

The editors can be used in a specific service to define a variable. Which editor is invoked depends on the `format` attribute of the `input` element.

3.6.1 The Number Editor

The number editor is a simple number typing editor. When first opened, the editor displays a label (specified by the WML `title` attribute of the `card` element and shown below as “Amount”), as well as the two soft keys OK and Back. The characters "123" in the upper left corner of the display signify that this is the number editor.



Using the phone keypad, the user can enter the numerals 0 through 9, as well as the following characters:

***** (asterisk) Click once on the asterisk (*) key.

+ (plus sign) Click twice on the asterisk (*) key.

- (hyphen) Click three times on the asterisk (*) key.

(pound sign) Click once on the pound (#) key.

. (period or decimal point) Click twice on the pound (#) key.

3.6.2 Text Editor

The phone text editor supports Uni-code format and will default to allow typing text in the language selected in the phone's menu system. The following display shows the text editor as it first opens.

In the editor, the right selection key **Back** first allows for back stepping, but when the user starts typing, it changes to **Clear** to allow for deleting the last character entered.

The left selection key in the Text Editor is **OK**. Text entry is done in either of these ways:

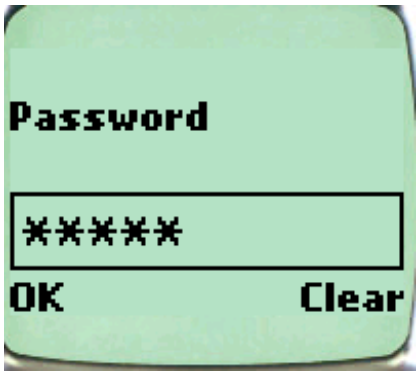
- The user can scroll to highlight a character to insert from the list on the right side of the display. Select will insert the selected character.
- The user can press the digit keys on the phone simulation to enter characters. To select the required character, the user may have to multi-tap the key. For example, to select the lowercase "c" character, the user must press the "2" key three times (each press within two seconds of the previous one).

The editor allows for the entering of alphabetic characters in both upper and lower case (the default is lowercase). To toggle between lowercase and uppercase characters, press the pound sign (#) key on the phone keypad. The current mode is indicated by the characters in the upper left corner of the display: “ABC” indicates uppercase and "abc" indicates lowercase characters.

3.6.3 The Password editor

Nokia also supports password entry with its password editor. This editor is similar to the text editor except that each entered character stay visible only for a few seconds and then changes to an asterisk (*), for security purposes.

The password editor is invoked when the `password` attribute of the WML `input` element is encountered in the WML deck. The following image illustrates the Password editor.

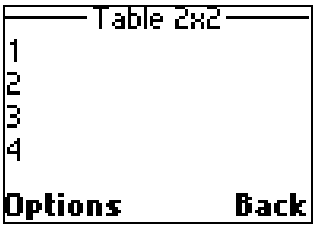


3.7 Tables

Tables with more than one column are not supported in the Nokia phones. So, for example, If a WML `table` element specifying a 2x2 table such as the following is encountered,

```
1 2
3 4
```

it is displayed as follows:



3.8 Graphics

Nokia supports Wireless Bitmap (WBMP) format graphics. Images that fit in the graphics area are centered. Images that are wider than the display are left-aligned and truncated on the right to fit the display. Images which are taller than the display are top-aligned and truncated on the bottom to fit the display.

There cannot be text next to an image; the image will always start its own line as shown in the following example:

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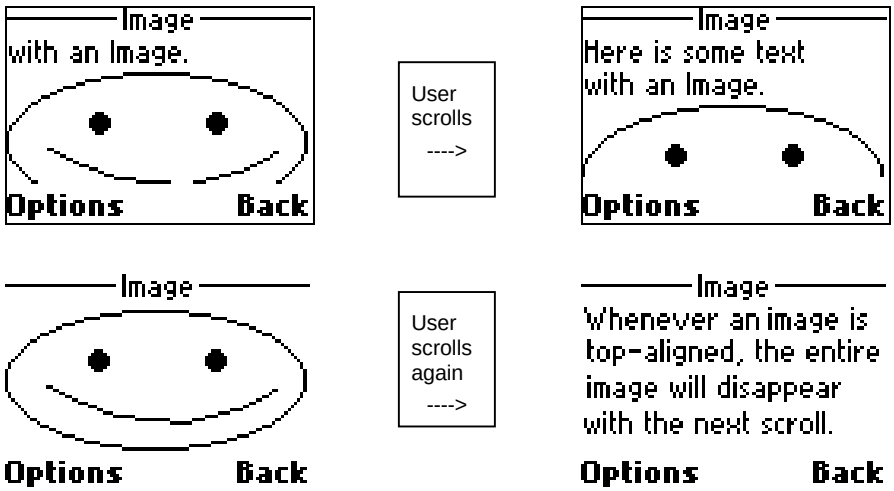
The user can scroll an image line-by-line, but when the image is scrolled to the top of the display, the entire image will disappear with the next scroll:



Bitmaps used as links are not supported. If an image is defined as a hotlink, the text specified in the `alt` attribute of the `img` element will be used as the link text and will appear underlined.

If a requested image does not exist, any text specified in the `alt` attribute is displayed. The `alt` attribute must always be included in the WML code.

3.9 Bookmark handling

The *Bookmarks* item is in the ***Options list***. When entering the *Bookmark*s option, the user gets access to the currently defined bookmarks. The following shows an example bookmarks display:

The user can scroll the bookmarks and select one. The Options on the left selection key in the Bookmarks list will contain:

- *Save as bookmark.* Allows the user to add the current Card to the bookmarks list.
- *Add Bookmark*. Type in and add a bookmark to the bookmarks list.

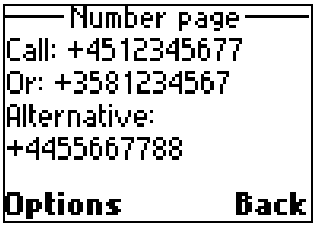
When there is at least one bookmark in the bookmarks list, the following options will also be shown:

- *Go to*. An alternative way of selecting the highlighted bookmark.
- *Edit*. Allows the user to edit the highlighted bookmark, changing URL and title.
- *Erase*. Allows the user to erase the highlighted bookmark.

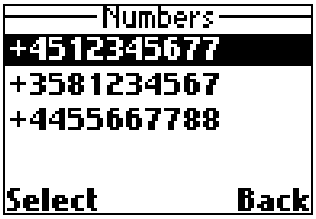
3.10 Use Number handling

The *Use Number* option is available via the ***Options*** selection key in the normal Browser display (when viewing a specific card), but it is available only if there are one or more numbers in the displayed card.

The following is an example contact card:



A note "No numbers found" is displayed if the item is used and no numbers exist on the active card. The *Use Number* option will allow the user to select any of the numbers in the card. Example:



The user can scroll the list and select a number. This phone will exit the browser and paste the number into the normal phone Standby Mode. From the Phone Standby Mode, the user can call the number, save it or send a short message to it.