Improving Help in the Symbian Operating System

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Tämän tutkimuksen tavoitteena on kartoittaa, kuinka Symbian-käyttöjärjestelmän ohjetoimintoa voitaisiin kehittää.

Tutkimuksen ensimmäisessä osassa tutustutaan käyttöoppaiden ja ohjetoimintojen eroihin, esitellään erilaisia ohjetoimintoja ja arvioidaan Symbian- ja Windows Mobile -käyttöjärjestelmien ohjetoimintoja. Tutkimuksen toisessa osassa käydään läpi asiantuntija-arvioinnissa tärkeimmiksi katsotut kohdat ja hahmotellaan, kuinka niitä voitaisiin käyttää Symbian-käyttöjärjestelmän ohjetoiminnossa.

Tutkimuksen aineistona ovat ohjetoiminnot kahdessa laitteessa, jotka ovat Symbian-laite Nokia E61i ja Windows Mobile -laite i-mate K-JAM. Työn ensimmäisessä osassa ohjetoimintoja tarkastellaan käyttämällä metodina heuristista asiantuntija-arviota. Asiantuntija-arvioinnin apuna käytetään Fillionin ja Boylen kategorioita (1991): 1) orientaatio, 2) käyttöliittymä/esitysmuoto, 3) haku, 4) navigointi, 5) indeksi, 6) hyperlinkit, 7) tekstuaalinen paradigma, 8) multimediasisältö ja 9) kustomointi/personointi.

Asiantuntija-arvioinnissa todetaan, että Symbian-käyttöjärjestelmässä on kontekstisensitiivinen ohjetoiminto, jossa on sisällysluettelo, indeksi ja rajoittunut haku. Ohjetoiminnossa liikkuminen tapahtuu Takaisin-näppäimen, Valinnat-näppäimen ja selausnäppäimen avulla. Ohjetoiminnossa ei käytetä värejä, hyperlinkkejä, grafiikkaa eikä multimediaa. Windows Mobile -käyttöjärjestelmän ohjetoiminnossa on sisällysluettelo ja haku, mutta ei indeksiä. Ohjetoiminnossa liikkuminen tapahtuu näppäimistön sekä ohjesovelluksen painikkeiden avulla. Ohjetoiminnossa käytetään värejä, hyperlinkkejä ja grafiikkaa, mutta ei multimediaa. Symbian-käyttöjärjestelmän ohjetoiminnon kehityskohteiksi ja tämän tutkimuksen jatkotarkasteluun valittiin Fillionin ja Boylen kategorioita mukaillen 1) aloitus, orientaatio, lopetus, 2) haku, 3) indeksi, 4) hyperlinkit ja 5) multimediasisältö. Tarkastellut kohteet eivät kuitenkaan ole tiukasti sidottuja mihinkään tiettyyn ohjetoimintoon, vaan tuloksia voidaan hyödyntää ohjetoimintojen jatkokehityksessä sekä Symbian-käyttöjärjestelmässä että laajemmin.

Tutkimuksesta nousee esille monia jatkotutkimuksen aiheita, kuten asiantuntija-arvioinnin havaintojen vahvistaminen käytettävyystesteissä loppukäyttäjien kanssa. Samoin voitaisiin tutkia, kannattaako panostaa Symbian-käyttöjärjestelmän oman ohjeen kehittämiseen vai kokonaan uuden ohjetoiminnon luomiseen. Yksi esimerkki tällaisesta kokonaan uudesta ohjetoiminnosta on selainpohjainen ohje, joka voitaisiin rakentaa toimimaan Symbian-käyttöjärjestelmän selaimissa. Selainpohjaisen ohjeen myötä Symbian-käyttöjärjestelmän ohjeiden kehittämiseen voitaisiin soveltaa jo olemassa olevia tutkimustuloksia www-sivujen käytöstä ja www-sivujen suunnittelusta pienillä näytöillä. Selainpohjaiset ohjeet mahdollistaisivat myös täysin uudenlaisen jatkokehityksen, kuten sosiaalisen median käytön ohjeisiin integroituna.

CONTENTS

Figures

Tables

GLOSSARY

user support	Instructional material provided to a product's end-user, such as user guides, helps, frequently asked questions, or knowledge base articles.
help function	User support format found in devices or applications, such as tool tips, office assistants, and help applications.
help application	A help function that often includes a table of contents, search, index, and is linked to the software either in one or in many places.
help topic	Instructions for a specific subject such as "Sending text messages".
help category	A collection of help topics grouped around a subject, such as application features or technology. For example, Text messages or Bluetooth.
integrated help	A help that is launched from the software. Integrated help opens in a small, standalone window that is usually on top of the application.
embedded help	A help that is part of the application user interface and is usually always open.
context-sensitive help	A help that is linked to the views and dialogs in applications so that the help topics provide instructions only for that view or dialog. Both integrated and embedded helps can be context-sensitive.

Abbreviations used in this study

FTP	file transfer protocol
HTML	hypertext mark-up language
OS	operating system
OTA	over-the-air
PDA	personal digital assistant
PDF	portable document format
UI	user interface

1 Foreword

Increasing mobility places new demands on technical devices such as phones and computers. No longer are these devices used only indoors and in stable conditions. Their users want to move around, *and* have immediate access to their e-mail, address book, office tools, and media applications – similar applications and services that they are able to access at home using their computers. This trend has led to phones and computers being combined into smartphones, which have started to resemble small mobile offices or mobile entertainment centres.

Naturally, this leads user support on the same path. If users want to read their e-mail or browse the web on the go, they should also be offered support on the go. It is not enough to offer user support only as a traditional printed user guide anymore – user support must become as mobile as the devices, something that is small and portable, non-disturbing, yet easy to access when needed. One user support format that fulfils these requirements are instructions that can be read on the device display, included in the device or its applications as a help function. The help functions range from small tool tips to complete help applications. Both are common in computers, but are also found in smartphones, such as the ones running the Symbian or Microsoft Windows Mobile operating system (OS). The Symbian OS has been a smartphone operating system from the beginning, whereas Windows Mobile OS is version of Windows OS created specifically for smartphones/personal digital assistants (PDAs).

I have become acquainted with the Symbian OS through my work at Nokia, where I have worked with Symbian devices since June 2003. Beginning with the Nokia 9210 Communicator and the first camera phone Nokia 7650 in 2001, Symbian OS has been used in the high-class smartphones that

Nokia manufactures. The help function in Symbian OS is called Symbianhelp. It is a context-sensitive help, meaning that when the users open a help topic from a view in an application, the help topic includes instructions for that view only. However, if the users do not find the answer from that help topic, it is not very intuitive to move to another help topic. In addition, the help resembles websites in that there is nothing concrete for the user to use as a starting point or navigational aid. Feeling frustrated, the users may give up and start looking for easier and less disorientating sources such as colleagues or call centre services, even though the information could be found from the help. Therefore, there is a clear need to develop the current system: moving between help topics could be made easier and finding the information and related topics simpler, thus also saving time and money.

This study has two main purposes: first, to evaluate two smartphone help applications, and second, to study development options for Symbianhelp, based on the results from the evaluation. However, I hope that my findings would have broader use, for example, that it would be possible to use the results with other help development as well.

As the evaluation method I have selected expert evaluation. Expert evaluation is a usability test method where the evaluator is a subject matter expert or a group of experts, who often use a list of heuristics as an evaluation aid. This method is quick, cost-efficient and simple to learn. An expert evaluation usually provides a list of the usability problems and possibly a suggestion of how to fix them. The greatest disadvantage of expert evaluation is that no real users of the product or service are included. Therefore the results may be slightly different than those from traditional usability testing. However, it is not always possible arrange traditional usability testing. (Korvenranta, 2005.)

This method seemed suitable for the purposes of this study, because the idea is not to find all usability problems in one help application, but to compare two different help applications and to see what kind of development options the evaluation reveals.

In the first part of this study, I will make an expert evaluation of the help functions in the Symbian OS and the Windows Mobile OS. I will use **Nokia E61i** as an example of a Symbian OS smartphone and **i-mate K-JAM** as an example of a Windows Mobile OS smartphone/PDA. These two help functions are quite different: Symbianhelp is basic and relies on the number of help topics to provide comprehensive support to the user, whereas Windows Mobile help is a more advanced and uses hyperlinks through which the users can find more information. I will base my expert evaluation on the categories of Florence Fillion and Craig Boyle (1991). In the second part of this study, I will use the findings from the expert evaluation to examine different development options for Symbianhelp. The second part can then be used as the starting point should Symbianhelp be developed further.

There is previous research on smartphones, but it has tended to concentrate on device usability and usage (see, for example, Palen et al., 2000; Ham et al., 2006; Massimi et al., 2007). There is also research on helps, hypertext and web design on small screens, which are all related to the subject of this study (see, for example, Loel and Albers, 2001; Lam and Baudisch, 2005; Kärkkäinen and Laarni, 2002; Farkas, 1993; Koivumäki, 2000). However, there is no existing research from this particular angle where smartphones and help functions are linked. This study is a pioneer work in this subject, and even though it is a pro gradu thesis and as such cannot be all-extensive, it is the first to look into an important, growing area in technical communication.

In this study, "Symbian smartphones" covers only those Symbian Series 60[1] devices that are manufactured by Nokia. Other companies manufacture Symbian devices as well, but those are not included in this study. Also, I will use the term "smartphone" to refer to the devices, even though smartphones could be divided into several different categories, such as camera phones, mobile computers, or communicators. It must also be noted that Nokia manufactures various other devices in addition to smartphones, but smartphones are the focus of this study and therefore I do not describe the others.

This study consists of four main chapters. Chapter 2 introduces the readers of this study to the world of helps. First, to set the background in which helps function, I will compare printed user guides to helps. Then, I will explain the two basic help types, integrated and embedded helps, and their enhancement, context-sensitivity. In Chapter 3, I will explain the selected usability heuristics in more detail. This is followed by the expert evaluation of the help functions in the Symbian OS and the Windows Mobile OS. In Chapter 4, I will study the selected items from Chapter 3 in more detail, and in Chapter 5, I will summarise the study and its findings.

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[1] For more information, visit www.s60.com.

2   Introduction to helps

In order to see smartphone helps in their correct context, a basic understanding of their general background is needed. This chapter will begin with a brief high-level comparison of printed user guides and helps. Even though electronic user guides in various formats could also be compared with helps, I decided to leave those out of this comparison because printed user guides and helps are what Nokia delivers to the users in the sales box, and electronic user guides are downloadable from the web. After the high-level comparison I will continue with more details from three aspects which in my experience are where the printed user guides and helps differ the most. These aspects are 1) access and navigation, 2) costs, and 3) schedules and updates. After setting the background, I will introduce two main help concepts, integrated and embedded helps, and describe what context-sensitivity means.

2.1   Printed user guides vs. helps

Sooner or later in product creation organisations, product management asks whether there is need for printed user guides and helps, or would it suffice to have one or the other. In my experience, the main reasons for this question seem to be time, money and effort: project management believes that without printed user guides and/or helps they can finish the products quicker, with lower costs and less work. Often it is not considered whether the users would then be satisfied with the amount of provided instructions, or more to the point, the lack of provided instructions. I think that both printed user guides and helps are required, and in the following subsections I try to explain why.

2.1.1 General comparisons

In the smartphone world, the devices are shrinking and the sales boxes are becoming smaller in proportion. This means that the space remaining for the printed user guides also becomes smaller. The height and therefore the page count of one printed user guide become limited especially when the device is sold in countries that must have several printed user guides in the sales box. For example, in Finland the Nokia sales box contains two user guides, one in Finnish, and the other in Swedish. Both of these user guides and possibly quick start guides or different leaflets need to fit into the sales box, and the main way to ensure this is to limit the page count. Limiting the page count of the printed user guide or removing the entire printed user guide also cuts down on the printing costs. As long as costs are an important issue, removing printed material may look like an easy way into cost-savings.

However, not all printed material can be removed. In some countries user guides are required by law. In Finland, the Consumer Protection Act states that a product is faulty if user instructions are not delivered with the product (Kuluttajansuojalaki 20.1.1978/38, 5:12a§) and the Language Act states that Finnish and/or Swedish instructions must be delivered with the product (Kielilaki 6.6.2003/423, 7:34§). Also, the instructions must be in such a format that the users can use them without difficulty. For example, if the instructions are delivered only on a CD-ROM and the user does not have a computer or a CD-ROM drive to use the CD-ROM, the instructions must be printed for the user. (Kuluttajavirasto.)

Even though all printed material cannot be removed, the project management can limit the page

count of printed user guides. This means that there is not enough space to explain all options in the printed user guide. Often, this detailed information may not even be what the users are looking for when they read a printed user guide. They may be looking for introductory information, such as descriptions on what a new application does, or instructions for basic tasks. At the same time, there may be other users who are looking for very specific settings and examples on the correct values. In other words, there can be several types of users looking for different types of information. One way to solve this problem of mixed audiences is layering, and Huckin and Olsen say that user guides are an example of a layered approach to information (1991: 65). They suggest that different sections of the user guide could be targeted at different audiences, making the separation of information clear and easily recognisable (ibid.).

At first, it would seem that Huckin and Olsen's suggested separation of information would perhaps be best accomplished by separating the information into two different information products, such as printed user guides and helps, not just different sections of a user guide. However, if one considers the users' need for "support on the go", it becomes unclear how exactly this kind of separation would be done. It cannot be expected that only expert users would use help and only novices would use the user guides, so both information products should include instructions for both levels of audiences. Despite this need, the separation of information already begins with the different orientation of printed user guides and helps, because printed user guides are usually device-oriented and helps are view- or dialog-oriented. To elaborate, the printed user guides explain the device as a whole, not as a collection of dialogs, and instruct in complete tasks. For example, the printed user guide could take the user through the whole process of setting up a WLAN access point for web browsing. Helps, on the other hand, concentrate only on one part of the process at a time, for

example on the WLAN security settings page of the WLAN access point setup, instructing in the view- or dialog-specific tasks. This close relationship between the application and helps also may lead to the help topics being somewhat technical and in some cases extremely detailed. The users may be searching for a description of "WPA2 only mode" from a help topic because the help is available when they encounter the option. This is what Price and Korman mean when they say that "Online help supports people when they encounter a problem in the midst of their work" (1993: 301). The users have a problem: they are not looking for reference information but for a quick, simple explanation and solution, and a quick look to a help topic should offer that to them.

Even though the help topics may include all the options in a view or fields in a dialog, they do not have to include everything. For example, instructing how to take a device into use by inserting SIM cards and batteries is not needed in helps, because the help cannot be accessed until the device has been taken into use (Hackos and Stevens, 1997: 55).

Finally, it must be said that research is inconclusive as to whether paper is better than online or vice versa. Horton lists nine studies that suggest that paper is better than online, and ten studies that suggest otherwise. This list leads him to deduct that good online documentation is better than poor paper documentation, and good paper documentation is better than poor online documentation, and online documentation does not guarantee success on its own. (1994: 14-15.) Of course, he does not deal with helps only, but all kinds of online documentation. Nevertheless, both printed user guides and helps should be functional and usable in their own particular format. When companies strive

towards cost savings with single-sourcing[2], this is an aspect that seems to be too easily forgotten, and it is imagined that everything that the users need is the same material everywhere (see e.g. Utriainen, 2004).

To summarise, printed user guides and helps are both needed for these reasons:

- Sales boxes become smaller and the page count of printed user guides becomes more limited, so the information needs to be made available to the user otherwise.

- Printed user guides may be a legal requirement in some countries.

- Different users have different preferences for medium and search mechanism.

- Paper and online are two different formats and deal with two different information types. The use and suitability of these information types has to be carefully considered in both. For example, novices and experts have different preferences for finding information (Horton, 1994: 75), and they may need different levels of instructions depending on the size and complicity of the task they are performing.

2.1.2 Access and navigation

As pointed out above, access and navigation are one of the most obvious differences between printed user guides and helps. Before going further, I will explain what I mean with these concepts. Access and navigation are two intertwining concepts, and it can be difficult to say when

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[2] For more information on single-sourcing, see e.g. Koikkalainen, 2002.

an access and navigation method, such as a table of content or an index, is being used as an access method or when it is a navigation method. First, access means the way in which the users open a printed user guide or help and start looking for information. The users start using a printed user guide by picking up the book. After that, there are three access methods: 1) table of contents, 2) index, and 3) browsing through the book. Horton lists also glossaries, headings, illustrations, page numbers and bookmarks as paper access tools (1994: 75). With helps, the users first need to know how start using the help, i.e., how to open the help topic from the application, or where to find the help application. After that, the access methods are almost the same as with printed user guides: 1) table of contents, 2) index, and 3) search. Second, navigation means the way one moves to or moves away from the section containing the desired information in a printed user guide or help. Navigation methods in both are the same as the access methods listed above, but there is one navigation method which primarily serves the navigation function: cross-references in printed user guides and hyperlinks in helps. In addition, Horton comments that users expect traditional paper access tools even in helps (1994: 75).

A table of contents, index, glossary, headings, illustrations, page numbers and bookmarks do appear in both user guides and helps, but they function differently. A printed user guide is concrete, something that the users can touch, browse, even write on if they want to. Printed user guides also normally look like books, and as long as printed user guides look like traditional books, most people know how to use them (Horton, 1994: 73). There is normally a table of contents at the beginning, often an index at the end, and the content pages in the middle. It is relatively easy to stay oriented in a printed user guide, as the table of contents, the index and the pages are static and do not move from place to place. It is also easy to mark the desired location somehow for future

reference, for example by folding the page. In helps, the starting point is different, because there is nothing concrete. As just mentioned, the users first need to know how to access the help, or in other words, how to launch the help from the application. This first access method can be, for example, an Options list command or a button on the user interface (UI). After that, the users can use the table of contents, index or hyperlinks to find where the desired information is located and move to read it or its related topics. Of course, with a table of contents and index, helps try to resemble a book, and hyperlinks try to imitate browsing a book in that clicking a link "turns the page". Despite this similarity, helps resemble web sites more than they resemble books because there are few static navigational pointers in them. When users click hyperlinks to move from page to page and browse back and forth, it is easy for them to get lost, or feel lost even if they are not (Fillion and Boyle, 1991: 61). The web is making navigating and reading web pages more and more familiar to users, so they are probably increasingly at ease with electronic user guides that can be read on computer displays as well. However, even if the users are increasingly at ease with electronic user guides in PDF or HTML format, they may not feel equally at ease with helps on a device display.

The table of contents and index are common to both printed user guides and helps, but the search function is specific for helps. In a study on how users read on the web, the majority of the users wanted to search first and browse later (Morkes and Nielsen, 1997). In another study, 85 percent of the surveyed web users claimed using search engines and search services to find specific information (Kobayashi and Takeda, 2000: 146). With the search function, the users can also first search for certain information, and then concentrate on the results. Almost 29 percent of searches were categorised as refinements in a study on Google's mobile search interface (Kamvar and Baluja, 2006: 707). To clarify Kamvar and Baluja's concept, refinements are new queries based on

the found results: a user could search for "smartphones" and based on the results, refine the search as "Nokia camera phones". In other words, refinements are a method to drill deeper in a category. However, it should be remembered that even though Kamvar and Baluja's users searched using a mobile device, they searched for information from the web and not help topics.

2.1.3 Cost considerations

Costs are the second aspect that must be considered when printed user guides and helps are compared. There are various costs associated with producing user support, such as content creation costs, translation and localisation costs, printing costs, and testing costs.

First, the source material for printed guides and helps needs to be written. The costs associated with this phase are mostly personnel costs and tool costs and other regular work-related costs, and they are more or less the same for both printed user guides and helps. Second, the source material needs to be translated and localised. Here, the used tools and processes can lead to big differences. For example, if the source material is single-sourced, the actual translation costs may be lower, but complete costs higher, based on the number of files and other special processing tasks. In addition, translation and localisation costs may also include costs incurred from publishing tasks such as desk-top publishing (DTP) where the source material is returned from the translation and localisation vendor in its final format. Third, after translation and localisation and publishing, the printed user guides need to be printed. In a way, the writers must constantly judge whether the importance of an explanation or some other piece of information is worth the cost of printing it (Charney, Reder and Wells, 1988). Horton estimates that most large companies spend 5 to 15

percent of their revenues creating and distributing paper documents (1994: 7). One can only guess

what the costs for creating and distributing paper documents are at Nokia. There are over 60

localised languages at Nokia (Karppinen and Katajisto, 2006), and printed user guides are produced

in most of these languages.

Finally, the helps need no printing as there is no need to produce physical copies, but instead of

publishing and printing costs, helps will incur testing costs. Helps are often tested in different tests,

such as localisation testing (where the correctness of the translations are checked) or functional

testing (where the functions, such as the use of links or context-sensitivity are tested). Testing can

be either automated or manual. For example, even though correctly working links can be

automatically tested, the correctness of actual localised text needs someone who speaks the

language to read it.

As mentioned earlier, electronic user guides in formats such as PDF are outside the focus of this

study, but I think that they should be mentioned here as they are another method of saving in costs.

The printed user guides are shortened and information is moved to electronic user guides, so that

the printing costs that the company must pay become lower. Putting electronic user guides to the

web can move the cost of printing to the users themselves, as there will always be users who need

or want their documentation in a "traditional" printed format and print out the information with

their own printers (Horton, 1994: 15). However, it is possible that the users do not like being

required to print the guides themselves, and will then buy their next device from manufacturers that

provide the guides for them. For the legal reasons which I already described, it will impossible to

put all material to electronic user guides that must be downloaded from the web. However, the users

do have the devices and their help function, so a well-designed and complete help application should aid in cutting down the costs in the long run.

2.1.4 Schedules and updates

The third aspect, namely schedules and updates, is relevant as printed user guides and helps often follow different schedules and that can cause extra problems. To begin with, helps can be updated later than printed user guides. For example, if first devices are sold in March, printed user guides would have to be printed in February if not even earlier. This requires that the content is frozen in November and translated during December and January. However, even though helps can be updated quite late, translated helps are needed much earlier than a translated and printed user guide. The reason for this is that helps need to be integrated to the software and go through different testing cycles. In spite of this, critical help updates could still be written and translated in February, and integrated to the sales software at the beginning of March. Helps will not then have to suffer from the biggest problem of printed user guides: being out-of-date the day they are printed (Hackos and Stevens, 1997: 4). The possibility to keep information up-to-date is very valuable in product creation where schedules tend to change.

Horton mentions a case where putting procedures online reduced the time needed for delivering updated documentation from over two months to less than two days (1994: 7). However, this probably would not be as quick with mobile devices where the device software would need to be updated. One possible method would be to update the help files over-the-air (OTA), but one problem with this update method is that the users may not notice that the files have been updated.

Of course, moving between issues of printed user guides may not be as clear either, if the only indication about the move is an issue number somewhere on the first pages of the guide, printed in small print. One possible solution could be to offer the users the possibility to subscribe to update information, so that they could download the updated help files themselves. Giving users the subscription possibility is becoming more common with RSS feeds: to put it simply, RSS is a type of mark-up language that allows people to follow websites automatically by downloading updated content to an RSS reader.

2.2 Basic help concepts

In this section I will introduce three basic help concepts: integrated, embedded and context-sensitive helps. Integrated and embedded helps are two different help functions, but context-sensitive help is not a help function as such, more like an enhancement to integrated and embedded helps. Both integrated and embedded helps can be context-sensitive. The most common help functions, WinHelps and HTML Helps (both from the Windows OS in computers) fit into these categories, and having basic understanding of those will help understand the more unusual smartphone help functions. There will be some references to smartphone helps in the following subsections, but they will be examined in more detail in Chapter 3.

2.2.1 Integrated helps

Integrated and embedded helps are often considered synonyms, but I do not believe that they are the

same help function with two different names. In my opinion integrated and embedded helps are two slightly different help functions: an integrated help is launched from the application UI, and it opens in a small, standalone window that is separate from the application, usually on top of it, whereas an embedded help is usually always open and part of the application UI.

Integrated helps normally open by selecting Help from a Help menu or pressing a dedicated help key, normally F1 or F2 in computer keyboards. The two most common computer helps, WinHelp and HTML Help, are integrated helps. The helps in the Symbian OS and the Windows Mobile OS are also integrated helps, even though they do not open in standalone windows as clearly as WinHelp and HTML Help.

Figure 1 shows the traditional WinHelp, which consists of separate windows. These windows open on top of the application to which they belong, and sometimes also on top of each other. One window shows the table of contents, the index, and the search function, and the other shows the help topic.
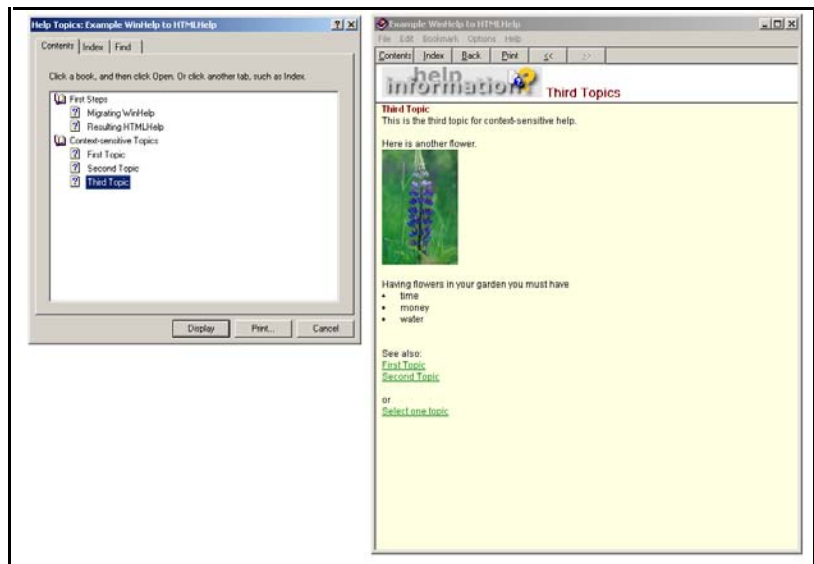

Figure 1: Example of WinHelp

Often, WinHelp opens from the application to the table of contents view. The users can use the

table of contents or index to open the first help topic, after which they can also use hyperlinks to move between the help topics. The users can open the table of contents from a help topic, but it opens on top of the help topic. If the users select a new help topic from the table of contents, it is closed as the new help topic opens. In addition, the table of contents and the help topic may not be synchronised, which means that the table of contents does not show where the help topic is located and what the surrounding topics are. All these are less than ideal features in a help function, and in Microsoft's next help version, HTML Help, they were changed.

The most easily noticeable difference between WinHelp and HTML Help is that HTML Help consists of a single window. Compared to WinHelp, one of the advantages of HTML Help is that the navigational methods, table of contents, index and search, are visible and accessible all the time on the one side of the help window, even though the content changes on the other side. HTML Help also opens on top of the application, as shown below in Figure 2.
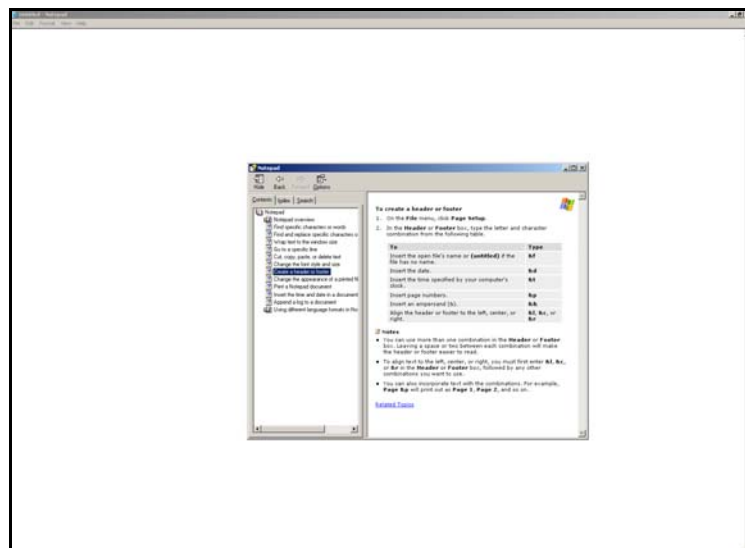
Figure 2: Example of HTML Help

Symbianhelp is also an integrated help. The help is launched from the application UI using designated help keys or Options menu commands, and it covers the display completely. In Figure 3 below, the application is shown on the left and the help topic on the right. Certain UI elements such as the indicators in the upper left- and right-hand corners do not move, so it can be seen that the application and its help topic are on top of each other. The application cannot be seen at all when viewing the help topic.
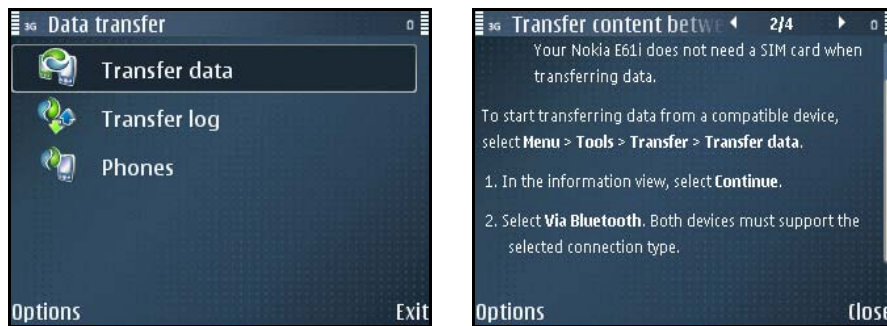
Figure 3: The Transfer application and one of its help topics

To summarise, an integrated help opens to a small, secondary window on top of the application and covers the screen space of the application partially or completely. But, as Horton states, sometimes the user needs information from the help topic to decide what action to take in the application, yet often helps open on top of the application and lock the user out. The user must then memorise the details or write them down before returning to the application. (Horton, 1990: 75.) The solution to this problem can be found by developing the integrated help to an embedded help.

2.2.2 Embedded helps

Embedded helps are very similar to the integrated helps. However, where an integrated help covers the application partially or completely, an embedded help opens or is located on the side or in one corner of the application. Embedded helps can offer the users the solution before the users even notice that they have a problem, but they also reserve a certain amount of space from the UI of the application (DeLoach, 2004).

There are various types of embedded helps. One of the most common ones is an embedded help pane, where the application is positioned left, and the help on the right. This is what Lockett Zubak calls "stationary embedding" (2000: 18). An example from Microsoft Word is shown below in Figure 4.

Figure 4: An embedded help pane in Microsoft Word 2003

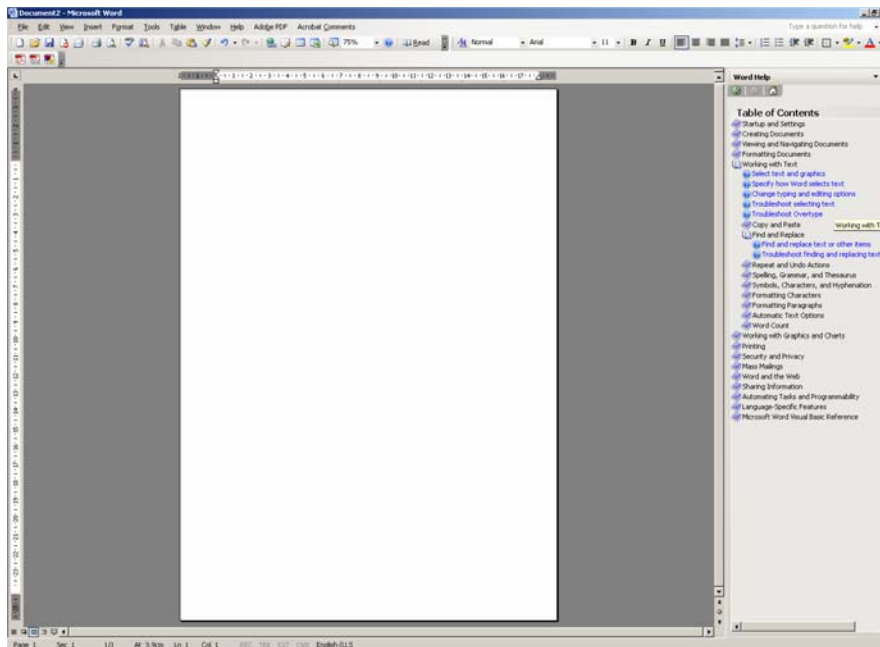The users can read instructions from the help window and use the application in its own window. However, it may be difficult to move between help topics in this view, because the table of contents may not be visible, and the users may need to open it whenever they want to move to another help topic. Also, if the table of contents is visible, it may not be synchronised with the help topics. As described earlier, moving between topics with hyperlinks can make the users feel lost. On the other hand, if the table of contents and the help topics are synchronised, it can become a distraction to more advanced users (Lockett Zubak, 2000: 19).

In my opinion, embedded help panes are one of the best ways a user can access help, in that the application and its help are visible at the same time, and neither is too small to be usable. The users can read the instructions while they are completing their task. This is important because the users do not have to shift their attention from their task to the help function; the same system that shows the users the UI options also shows them what the options mean (Randall and Pedersen, 1998: 68). Gery believes in embedded helps as well, stating that they are one way of having learning and doing tightly coupled, and that they have an impact on the users' "time to performance" (1999). Unfortunately this approach is not suitable for smartphone helps, because the height and width of the display is usually not large enough. An embedded help pane might be made to work in the devices with the largest displays, but application developers might not be willing to give valuable display space to a help function.

Another type of embedded help is what Lockett Zubak calls "process-embedded help". This means that help is evoked when a user takes or fails to take an action. For example, Microsoft Publisher, which is a desktop publishing system for home users, uses a wizard-like interface to guide the user

through the process of creating a document. (2000: 19.) An example is shown below in Figure 5.

Figure 5: Process-embedded help in Microsoft Word 2003

Yet another example of embedded help can be found simply by looking at Microsoft Word or almost any other Windows application. In addition to the help pane, Microsoft Word offers embedded help using tool tips and the office assistant. Tool tips are helps, even though they are normally considered normal UI elements. They are very small helps, consisting of single words describing the icon of the tool, but nevertheless they can be considered embedded helps. Tool tips have reached a level where they are not considered helps anymore, and that is what all help development should aim at. Helps should be considered an integral part of the UI, something that is always present or immediately reachable should it be needed, yet something that does not bother the user when it is not needed. One example of such a help is context-sensitive embedded help.

2.2.3 Context-sensitive helps

More and more information is available to people daily. Not all is information that users need or

require; most of it is very likely extra information that competes for the users' attention. Context-sensitive helps are a good way to ward off the threatening information overload. They can be available all the time or be accessible when the need arises, but they are also unlikely to bother the users when they concentrate on tasks that they can do without assistance.

Context-sensitivity means that task-specific instructions can be opened in any view, window or dialog in an application. As already noted, both embedded and integrated helps can be context-sensitive. There are two types of context-sensitivity, field-level and window-level context-sensitivity. A field-level help displays one topic for each object, for example a field or button (James-Tanny, 2000). Field-level helps are also often called
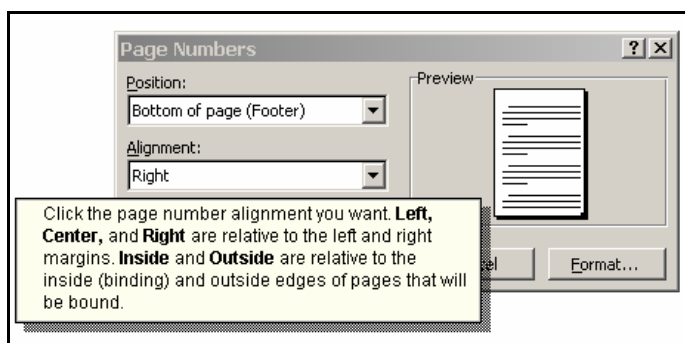
Figure 6: What's This? help in Microsoft Word 2002

What's This? helps. The name comes from the question mark icon that can be located on the upper right corner of a dialog as show in Figure 6.

In my opinion, field-level context-sensitive helps are the easiest context-sensitive helps to use, because the specific information is displayed at the users' request. They are also one of the most common pieces of context-sensitive information provided today (Hackos and Stevens, 1997: 57). What's This? help texts usually consist of just a few lines of text, as Figure 6 above shows. It can be debated how helpful small pop-ups that describe items with one or two sentences actually are. The usefulness of field-level context-sensitive helps depends on the users' needs. If the user does not

understand one or two items in a dialog, the field-level helps offer enough assistance as they concentrate on only one item at a time. But if the user does not understand any of the items in the dialog, then field-level instructions provide a fragmented picture instead of a complete one. In such cases field-level helps are not very helpful, leading to confusion rather than understanding. Instead, a window-level context-sensitive help is a better solution, because window-level context-sensitive helps describe the entire dialog.

Window-level context-sensitive helps can contain the same information as all the field-level helps, but the information can be read on a single page instead of several small pop-ups. Therefore, if the users need an overall picture of all the fields contained in a dialog, window-level context-sensitive help is what they should find most helpful. However, because all fields are in one topic, it is harder for the users to find help for the field about which they are uncertain (James-Tanny, 2000). Both Symbianhelp and Windows Mobile help are window-level context-sensitive helps.

Context-sensitivity can also cause problems for the users. Horton describes the situation by saying that if the chosen topic matches the users' situation, the information presented is immediately useful (1990: 78). But this is not always the case in context-sensitive help functions, because it is possible to open a context-sensitive help topic that does not answer to the question that the users have in mind. From the help function's point of view, the users are in an incorrect context. The help topic can give correct instructions that would match some other situation and aid with some other question, but for the users' current question, the presented information is not useful, but instead confusing. (See also Nielsen, 1993: 32.) From the users' point of view, the help function is not good, because it is missing just the important information that they would need. In addition, people

do not necessarily have very long attention spans, and they may not want to spend very much time looking for the answers to their question (Nielsen, 1997). This means that if the first or second help topic is not what the users need, they may give up and go look for some other sources of information. Therefore, the so-called related topics links are useful in context-sensitive helps. Related topics links are a list of links at the end of the help topic that lead to other help topics that most often offer additional information on the same subject.

Context-sensitive help topics are more closely connected to the features of the application than any other type of documentation. Horton notes that "One of the most difficult tasks in writing online documents is dividing the content into topics" (1990: 100). This is true, but with context-sensitive helps, the application controls help design. Since each field, dialog or window may need a help topic, it is the number of these features that determines the number of help topics. Similarly the features control the content of each help topic, because context-sensitive help topics should include instructions only for the view or dialog for which they are written and all extra information should be excluded. For example, it must be assumed that a user knows where the Control panel or what a menu key is.

3 Evaluating smartphone helps

In product creation, much thought is given to the usability of the smartphone and its applications. The tests can start so early that there is nothing concrete to test, but the usability specialists have to evaluate ideas and specifications, perhaps using established usability heuristics as the basis of their evaluation (Korvenranta, 2005: 113). The usability of the smartphone help application is equally important, but it cannot be evaluated using the same usability heuristics as the smartphone itself (see Purho, 2000). In this chapter, I will make an expert evaluation of two smartphone help functions, one in Nokia E61i and the other in i-mate K-JAM. I selected these devices as I have been working with Nokia E61i, and i-mate K-JAM is a similar product with a full keyboard and comparable applications and operating system. Both devices are advertised for business users and sold at approximately the same price. As the basis of my expert evaluation, I will use a specific set of usability heuristics that I will introduce in the next section.

3.1 Usability heuristics

The most commonly used usability heuristics are what is now called "Nielsen's list" (Korvenranta, 2005: 113). They are a set of usability heuristics originally created by Molich and Nielsen (1990: 339) and further refined by Nielsen into ten heuristics that cover items from the system status to help and documentation (2005B). However, Nielsen's list was created for evaluating user interfaces. Based on Nielsen's heuristics and a discussion on the STC Usability SIG mailing list, Purho created nine heuristics for evaluating documentation usability (2000). Because Purho's heuristics have been

created for documentation usability, and they have been successfully used in evaluating documentation (see, for example, Salomaa, 2004).

Instead of documentation, the starting point in DeBoard's heuristics is an online help. DeBoard is a practitioner, not a researcher, who was asked to evaluate online helps. As he did not find any heuristics that would describe online helps, he created the heuristics himself. His starting point is the ISO 9241 standard, and he created five heuristics:

1) Effective

2) Efficient

3) Engaging

4) Error tolerant

5) Easy to learn. (2004.)

DeBoard's heuristics probably suit best for usability evaluation by real users, as that was how DeBoard needed to use them. The three heuristics have related elements, which is not surprising as Purho's heuristics are based on Nielsen's list, and DeBoard's heuristics can be considered high-level descriptions for the more detailed heuristics of Nielsen and Purho. For example, DeBoard's "error tolerant" equals Nielsen's "help users recognise, diagnose, and recover from errors", and Purho's "purposeful documentation" matches with DeBoard's "efficient".

However, the purpose of this study is to look at help functions. As described in Chapter 2, they

resemble websites and this speciality needs to be remembered when selecting the heuristics for the expert evaluation. Therefore I decided to take Fillion and Boyle's nine categories in hypertext documentation usability as the heuristics for my expert evaluation. Fillion and Boyle's categories were based on an investigation of sixteen hypertext documentation systems and their strengths and weaknesses:

1) Orientation

2) Interface/Presentation

3) Search

4) Navigation

5) Index

6) Hyperlinks

7) Literary Paradigm

8) Electronic Augmentation

9) Customisation/Personalisation. (1991: 60.)

In their category descriptions, Fillion and Boyle refer to a hypertext document, and I will use the same term here. It can also be seen that several items from the access and navigation discussion in Chapter 2 appear in Fillion and Boyle's categories as separate items. Five of Fillion and Boyle's categories, namely orientation, search, navigation, index and hyperlinks, are access and navigation methods. In a way, access and navigation is a higher level concept or group, and orientation, search, navigation, index and hyperlinks belong to that group as lower level items. In the following

category descriptions, I will use Fillion and Boyle's division of items. Fillion and Boyle themselves think that four categories are even more important than others: orientation, search, index and literary paradigm (1991: 60). However, I believe that all nine are important, and will use all of them in my expert evaluation. Next, I will go through the categories and describe what they contain.

Orientation

Orientation means the users' sense of place in a hypertext document. Fillion and Boyle consider this to be one of the most important issues to be addressed before the hypertext document can become more effective than a printed document. Hyperlinks allow the users to move freely and quickly from their starting point, which means that they may become disoriented and fear that if they find something useful, they cannot find it again. The main reason for disorientation is the lack of reference points, as the desired information can be anywhere. Fillion and Boyle recommend that it must be ensured that a hypertext document has reference points, orientation cues and some notion of direction. (1991: 61.)

Interface/Presentation

Interface/Presentation deals with the presentation of text on the screen. Fillion and Boyle argue that the presentation of hyperlinks in the middle of regular text needs careful consideration, and also say that this will evolve and change constantly as displays develop. (1991: 63.) For Fillion and Boyle, Interface/Presentation are not crucial to the development of hypertext systems (1991: 60), but in my opinion they need to be looked at, especially when adding new elements such as hyperlinks to help topics.

Search

Fillion and Boyle maintain that if users cannot use search mechanisms in hypertext documents efficiently, they will abandon hypertext for paper. Fillion and Boyle are also concerned that with some search mechanisms, the users get too many hits as a return to their query, and with others, not enough. In addition, Fillion and Boyle advise that the presentation of search results should be well planned and it should be decided whether they are listed sequentially, as a list of links, or as a markers in the table of contents. (1991: 61-62.)

Navigation

Fillion and Boyle consider navigation tools as some of the most important hypertext document features. Well designed navigation can help solve the disorientation problem that they discuss in their Orientation category. (1991: 64.) Navigation tools, together with links, are what helps the users move efficiently through the network of topics (1991: 60).

Index

Indexes are a mandatory complementary tool to the search mechanism, Fillion and Boyle declare. They say that the usefulness of search is limited because it requires users to enter specific keywords, but indexes are an option to users who do not know the terminology used by the system. (1991: 62.) However, here I disagree to some extent, as indexes require the users to recognise the words listed in the index as the one they are looking for. In addition, Fillion and Boyle state that finding the right index format is crucial for the development of a hypertext document, and say that the formats can vary from a simple alphabetical list of keywords to a set of overlapping lists, such as lists of tasks and commands in the case of technical reference documents (1991: 62).

Hyperlinks

Fillion and Boyle list links in their list of usability issues because they think that there are always problems with the optimal number of links (1991: 64). Links, together with navigation tools, are what helps the users move efficiently through the network of help topics (1991: 60).

Literary Paradigm

Literary Paradigm deals with the writing styles and text structures that should be used in hypertext documents, as hypertext document organisation must be adapted to make reading more efficient and accurate (Fillion and Boyle, 1991: 60). Even though I will not look at readability issues in the evaluation, it is relevant to briefly describe readability strategies and differences between print and online text, because the basic principles affect how text on display is presented and understood.

Coe has distinguished five readability strategies: skimming, scanning, searching, receptive, and critical. Skimming is reading to find the general idea behind a text, scanning is reading to find specific information quickly, searching is scanning with the meaning of certain specific information in mind, receptive is reading for thorough comprehension, and critical is reading for evaluation. (Coe, 1996: 139-140.)[3] Of these reading strategies, scanning seems to be preferred by users. In a study of website usability by Morkes and Nielsen, 78% of their test users scanned an unfamiliar Web page before reading it. The researchers state that headings, large type, bold text, highlighted text, bulleted lists, graphics, captions, topic sentences and tables of content enhance scanning.

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[3] Another way to look at readability is that of Hargis. She has divided readability into five levels: 1) legible or hearable, 2) interesting, 3) comprehensible, 4) translatable, and 5) learnable and doable (2000: 123). In my opinion, Hargis' levels of readability are very suitable for help design, too.

(1997.) I think that hyperlinks can probably be placed in this same category, as the users' eyes can easily jump from hyperlink to hyperlink. Horton's comment to readability strategies is that in many documents the only way to find information is to read the entire document and notes that this is a very inefficient way of finding information (1994: 54-55). Hackos and Stevens report that users do not want to read extended, continuous text on a computer screen, but say that they are willing to read short texts if they available within the context of their task (1997: 50). This is the same conclusion that Grayling made in his studies, where HTML Help was replaced with embedded help. The test users used and liked embedded help (2002: 208) when they had previously done everything they could to avoid HTML Help launched from a Help menu (2002: 193).

In addition to readability strategies, the differences of printed and online texts affect the readability of a document. Knowles Rubens says that readers do not look at a printed page and a display the same way: the angle at which we view the text is different, the resolution of the display affects what we see, the amount of text that can be viewed is different, and the glare and surface of the display force the eye to adapt to read the text (1988: 161). Similarly, many online documents fail because the writer fails to account for the differences between online and paper documents (Horton, 1990: 196). When reading on paper, the users can quickly move between pieces of information any way they want, but when reading on display, they can only follow the paths that have been designed by the authors. However, even on paper, the readers rarely read linearly from the beginning to the end. They look at the table of contents, jump to a heading in the text, read a little, jump back, look at the index, and so on, as was also discussed in Chapter 2. (Horton, 1994: 101-103.)

Electronic Augmentation

Electronic Augmentation means the use of advanced technologies such as sound and video. Fillion and Boyle call these "exciting" but are also wary of them. They hope that these advanced technologies are not used before it is understood how and when they are to be used in hypertext documents. (1991: 64.) In my evaluation, I will include graphics in this category as well.

Customisation/Personalisation

Customisation/Personalisation is the term Fillion and Boyle use for marking pages that are useful or otherwise worth remembering (1991: 64). As mentioned in Chapter 2, printed user guides are good because the users can mark the pages, for example, by writing on the margin. Hypertext documents should include similar functions.

Fillion and Boyle's categories are closely related and interlace to some extent, and sometimes it will not be possible to talk of one without the other. Therefore, for the purposes of my evaluation, I will group Fillion and Boyle's categories into five groups as follows: 1) Orientation, Navigation, Search, and Index, 2) Links, 3) Literary Paradigm and Interface/Presentation, 4) Electronic Augmentation, and 5) Customisation/Personalisation.

In the following sections, I will introduce Symbianhelp and Windows Mobile help and make an expert evaluation of both help applications using these heuristics.

3.2 Help in the Symbian OS

The Symbian OS is used in the most sophisticated smartphones, and its applications are similar to or even compatible with those in the Windows OS. Even though mobile phones running the Symbian OS are not as widespread as computers running the Windows OS, over 70 per cent of all smartphones have the Symbian OS (Symbian, 2007). To compare, approximately 90 per cent of computers have the Windows OS (Market share, 2007). As stated in the introduction, I will only concentrate on the Symbian S60 devices that are created by Nokia. The help in all Nokia's Symbian S60 devices functions in the same way; the only differences are caused by the differing hardware of the devices.

3.2.1 Example device: Nokia E61i

Nokia E61i is a business device that is optimised for messaging. The device has a full QWERTY keypad, camera and a noticeably larger display than in some of the smallest Nokia devices, such as Nokia E50. The device is approximately twelve centimetres in height and seven in width; the display has 320 x 240 pixels and is approximately 6 x 5 centimetres in height and width. The device is shown in Figure 7.
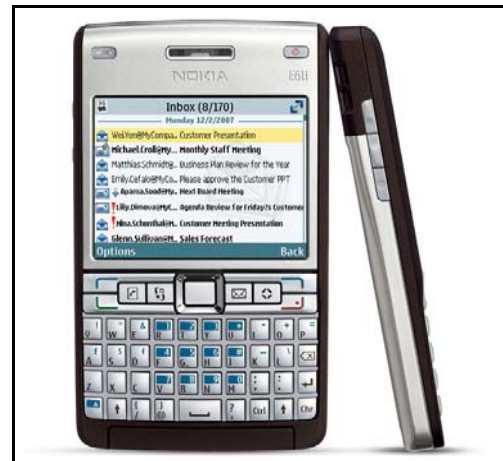
Figure 7: Nokia E61i

The keypad is similar to a computer keyboard, with keys for Backspace, Caps Lock, Shift and

Enter, and special keys for the Contacts application, the active standby state, the E-mail application

and one freely selectable application. The device is meant for business users and the set of

applications reflects that: there are corresponding applications for Microsoft Word, Microsoft Excel

and Microsoft PowerPoint, applications for file management, applications for enhanced mobile

teamwork, and a set of other data and device management applications. In the following evaluation,

I will use screenshots taken from the device itself, as it has a screen capture application.

3.2.2 Expert evaluation of Symbianhelp

Orientation, Navigation, Search and Index

Symbianhelp is an integrated help and it is context-sensitive on a window-level. The users can

access the help in two ways:

1) The users can open a context-sensitive
help topic from the Options lists in the
applications. In the Options lists, the
second-to-last option is usually Help. Figure
8 shows how a help topic is accessed
context-sensitively from an Options list.
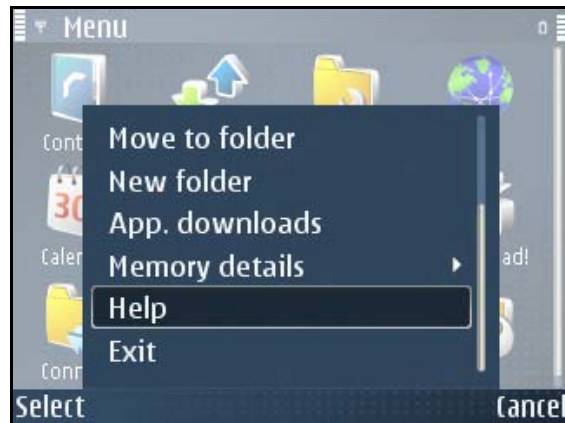
Figure 8: Context-sensitive access to help

2) The users can go to the Help application,

which is located in a Help folder in the main

menu. The Help application is a separate application in the device, and it lists all help topics in a device. Figure 9 shows the table of contents in the Help application.

Figure 9: Table of contents in Symbianhelp

The Help application can be described with a book metaphor. It has a table of contents and index just like a book, the help categories (such as Bluetooth or Calculator, see Figure 9) could be chapters, and the help topics (such as Office folder, see Figure 10) could be the pages in a book. The advantage of this electronic book when compared to a physical one is the search function, which automates the search that the users would have to do themselves by browsing the physical book.

As can be seen in Figure 9, there is a Search box under the help categories. Entering a letter starts sorting the help categories, so that only those categories that include the letter are shown. For example, entering "M" into the search box would return Messaging, but also App. mgr, which can be can be disorienting. The users may think that the search box searches everything in the help, and not just the table of contents.

The table of contents in the help application lists the categories that have help topics. A category is usually an application, feature or technology, such as Calculator, Handwriting recognition, or

Bluetooth. A category can be expanded to a help topic list that shows a list of the help topics

available in that category. Figure 10 shows

what help topics have been created for the

device's main menu and its folders.

Figure 10: Help topics list in Symbianhelp

As can be seen in Figures 9 and 10, if the users are accessing help using the Help application, they

first need to figure out how to get from the table of contents (in Figure 9) to the help topic list (in

Figure 10) before they can decide which help topic to select. The easiest way to do this is to scroll

to a category, such as Menu, and press the scroll key. It is also very likely that the users of S60

devices are so "phone-educated" that they know that pressing the scroll key expands or opens items,

especially when the category icons resemble folders.

However, the users need to select the correct category and help topic only when they look for a help

topic from the Help application. If they access help using the Help option in the Options list, the

correct help topic is automatically shown to the users. On the other hand, the help topic may not

answer the questions that the users have, and then the users need to figure out how to move to other

help topics, as there are no links that would ease moving between help topics.

A table of contents may be one of the most common methods of access, but not all users want to go

through them to find the help topic that they need, as was already discussed. This makes it

important to offer other methods of access in

a help function. Symbianhelp has both

an index and a search function. The Search

by keyword command, shown in Figure 11,

opens the index in which the user can

search or scroll through predefined index

items.

Figure 11: Available commands in a help topic

The index is shown in Figure 12.

Figure 12: Index in Symbianhelp

There is no full-text search in the Nokia E61i, and the search function relies on the index keywords

only. In the index keyword search the users can either scroll the list of index keywords up and

down, or enter a search query which must match any one of the index keywords. This, of course

means that the users and the index designers must use the same terms and have the same logic,

which is challenging. It is important to recognise this problem, because if the users do not find what

they are looking for, they will most likely abandon the index and perhaps even the whole help.

Even though the table of contents, index and search function are available in Symbianhelp, other

navigation methods are quite limited. The only way of moving from one help topic to another is to

return to the table of contents and to select another help topic from it: the users must press the Back

button or open the table of contents from the Options menu.

Hyperlinks

There are no links in Symbianhelp as the help application does not support them. The lack of links

is a problem because the help topics can become long as certain items need to be explained in each

one. For example, the explanation for "access point" may need to be added to each help topic where

"access point" is mentioned, because it is not possible to link to a common help topic, such as

"What are access points".

Literary Paradigm and Interface/Presentation

Most help topics in Nokia E61i consist of bulleted lists, each bullet containing instructions for one

task. This makes the help topics rather long, so that the users must scroll several display lengths

before reaching the end. Hyperlinks would be useful here as well, as they could be used to break the

information into smaller sections or help layering the information for different user groups. It can

be claimed that scrolling is required only in poorly structured documents, but in smartphone helps,

the display is a physical restriction that cannot be changed to prevent scrolling. Therefore some

scrolling would most likely be needed even if hyperlinks could be used for breaking and layering

information.

There is no consistent structure in the help topics, but three elements seem to be used more often:

bulleted lists containing instructions for one task, option lists containing different UI options and

their descriptions, and normal paragraphs. There are tips, but no notes. The text colour depends on

the selected theme, and no other colours are used. The display texts are always bolded. Most of the

other content is in normal paragraphs and the entire display can be used for the text.

However, this may make the help topics

boring to read. Figure 13 shows a typical help

topic.

Figure 13: A help topic in Symbianhelp

Electronic Augmentation

There are no graphics, sound or video in Symbianhelp.

Customisation/Personalisation

There are no customisation or personalisation possibilities in Symbianhelp.

To summarise, the help function in Symbian OS is comprehensive, but basic. No colours, graphics

or multimedia is used, there are no links, and besides bold that is reserved for display texts and

bullets which are mainly used in task descriptions, there is no other formatting to enhance the layout

and appearance.

3.3 Help in Microsoft Windows Mobile

Next, I will evaluate the help function in a Windows Mobile device, i-mate K-JAM.

3.3.1 Example device: i-mate K-JAM

The i-mate K-JAM is a Pocket PC device with the Windows Mobile operating system. The OS version in the device that I used in this analysis was 5.0. The latest version of Windows Mobile is 6.0. K-JAM is approximately eleven centimetres in height and six in width; the display size is

Figure 14: i-mate K-JAM

approximately six centimetres in height and 4,5 in width. The device has a touch screen and is used with a stylus, but it also has buttons for easy access to applications such as phone, e-mail, Internet Explorer and camera. The device display can be moved aside to open a full QWERTY keyboard. Similarly to the Nokia E61i, the K-JAM has softkeys that are used to perform commands shown on the display, and Call and End call keys on the cover phone side. The display is portrait on the cover phone side, but when the device is opened to show the full QWERTY keyboard, the display turns landscape. The device is shown in Figure 14.

Microsoft Windows Mobile is just what its name says, a mobile version of Microsoft Windows. The applications are mobile versions of normal Windows applications, such as Excel Mobile, PowerPoint Mobile, Word Mobile and Windows Media Player, enhanced with separate applications such as Calendar and Contacts that are also found in the Nokia E61i. There are applications for file management, ActiveSync for synchronising and Skype for Internet telephony; all and all, the K-JAM is a miniature computer, just like Nokia E61i.

3.3.2 Expert evaluation of Windows Mobile help

This section does not have screenshots because there is no screen capture application in the i-mate K-JAM.

Orientation, Navigation, Search, and Index

The Windows Mobile OS help is an integrated help and it is context-sensitive on a window-level, exactly like Symbianhelp. The help in the K-JAM, the help is accessed from the Start menu. The last item in the Start menu is Help, and it opens a list of help topics. For example, in the Today screen, the Help shows help topics such as "Customize the Today screen" and "Add a custom background image".

The help topics list that opens from Start > Help contains "How do I …" help topics such as "Start a slide show presentation" and "Customize the Start menu" and reference help topics such as "Overview of PowerPoint Mobile" and "Synchronizing Calendar, Contacts, and Tasks". In some help topics, the reference help topics are titled with the heading "See also".

The help topics list consists of hyperlinks to the help topics. To open a help topic, the users must either tap the hyperlink with the stylus, or scroll to it with the Tab key or the arrow keys on the full keyboard, and press the Enter key. This is different from Symbianhelp, where the help categories and help topic lists are static text that must be selected first by scrolling to the desired category or help topic, and then pressing the scroll key. In the i-mate K-JAM, the users must tap the left arrow key on the bottom of the display, or press the backspace key on the full keyboard to return to the

help topics list from a help topic.

It is also possible to reach the table of contents and the search function from the help topics list and from a help topic with a single tap. The table of contents contains hyperlinks to higher-level categories such as "Using Windows Media Player Mobile" and "Browsing the Web". The table of contents has 22 categories. The categories contain hyperlinks to help topics in that category. These categorised help topics lists are not context-sensitive; thus the list of help topics is longer than the help topics lists that are opened context-sensitively. For example, there are 18 help topics listed for Excel Mobile, but if the users open Excel Mobile and then select Start > Help in its main view, there are only four help topics. If an application does not have help topics, selecting Start > Help has no effect; no messages about unavailable help topics are shown.

The Search function in the help function is the same search that can be accessed elsewhere in K-JAM as well. The search query is entered in the first field; the search type is selected in the second one. If the user opens Search from the help function, the search type is automatically "Help". When the users are entering the search query, the system displays matches to the query as it is being entered. The users can then select the matching suggestion, and that they do not have to enter the entire search query. After the search query has been entered or selected, the users must tap or press the Search button before the device starts the search. The device displays different details in the search results, such as the help topic title (for example, "Set the time and date"), the application from which the item was found (for example, "Help" or "Messaging"), a date (for example, the date when a message was received) and the size of the found item. The device remembers the previous search queries and the users can select those from a drop-down list if they want to redo the search.

Hyperlinks

Navigation between the help topics is done with hyperlinks. The help topics have "See also" links to other help topics that are related to the current open help topic. This means that the "See also" links are used for two purposes: linking reference information and related topics to a help topic. Some help topics also include hyperlinks to other help topics inside the text.

Literary Paradigm and Interface/Presentation

Each help topic in K-JAM begins with a title. The title is not in a title bar, like in the Nokia E61i, but it is embedded in the help topic text. This embedding means that some of the help topic titles are fairly long, as their length is not restricted by outside forces such as the static length of the title bar.

Some but not all help topics include an introductory paragraph at the beginning of the help topic. For example, the help topic "Sort the message list" has an introductory paragraph that states "If you have a long list of messages, sorting the list can help you quickly find the item you want." Other help topics, such as "Send a link via e-mail", do not have an introductory paragraph but start immediately with step lists. It may well be that the help topics with a clear title or simple tasks do not include an introductory paragraph because the users are more likely to succeed, for example, in sending a link via e-mail than connecting to the Internet.

The structure of the help topics varies between very simple and fairly complex. The simplest help topics do not contain more than step lists and "See also" links, but slightly more complex ones may also include notes or tips at the end of the help topics before the "See also" links. Horizontal lines

separate the step lists, notes and tips. The most complex help topics may also include bulleted lists (even inside the step lists), graphics, tables, and examples inside the text.

The text is normally black, and the display texts often bolded. The K-JAM also includes non-Microsoft applications which have their own help files, and those are a bit more varied than the original help files. In some additional help topics, the text is blue, and a lot more graphics are used. In others, no "See also" links are used, or the tables in the help topics contain no borders. If borders were added, the tables might require more space, but that would make tables more readable than what they are in their current layout.

Electronic Augmentation

No multimedia is used in the i-mate K-JAM help. However, the help is built with HTML pages, so the use of multimedia such as animations might be possible as the help function itself does not prevent that.

Customisation/Personalisation

It is not possible to customise or personalise the help in i-mate K-JAM. In some versions of the Windows Mobile OS, it is possible to create bookmarks to help topics. The help topics are regular HTML files and can be exported to a computer, for example. This means that the users could edit the help content, but I am not sure how many users would actually resort to these measures.

To summarise, the help in the Windows Mobile OS is an advanced help function in a mobile device. The help uses hyperlinks, graphics, and colours.

3.4 Evaluation summary

To finish my evaluation, I will summarise the evaluation findings, so that it is easier to compare the two help applications.

Table 1: Summary of Symbianhelp and Windows Mobile help evaluation findings

Heuristic	Symbianhelp	Windows Mobile Help
Orientation Navigation Search Index	Context-sensitive Table of contents Index Search Back button Options list Scrolling left or right	Context-sensitive Table of contents Search Keyboard keys Navigation buttons on display
Hyperlinks	No	Yes
Literary paradigm Interface/Presentation	Bullets mark a task Tips No colours	Step lists Bulleted lists Tables Tips, Notes, Examples Colours used
Electronic augmentation	No multimedia No graphics	No multimedia Graphics used
Customisation Personalisation	No	No

As one can see, the biggest difference between Symbianhelp and Windows Mobile help is the use of links. Their use in Windows Mobile eases navigation and gives users easy pathways to information. Links may contribute to disorientation, but they can also lessen frustration by leading the users into help topics which include related information. Both helps have a table of contents and search, but only Symbianhelp has an index. Then again, Windows Mobile help uses graphics and colours, which are not used in Symbianhelp. Neither help uses multimedia or allow customisation or personalisation, but offer multiple navigational methods on the help application UI.

Based on this evaluation, I will look at five issues in the next chapter. I selected these five issues because they are either very important or very different between the two help functions. The issues are: 1) access, orientation, and exit, 2) search, 3) index, 4) hyperlinks, and 5) electronic augmentation. Four of these are directly from Fillion and Boyle's categories, but for the first one I combined access and exit with Fillion and Boyle's orientation because a user must first be able to open the help and last be able to exit quickly from the help. Also, in electronic augmentation, I will discuss colours, even though it was evaluated in the Interface/Presentation category. The reason for this is that Interface/Presentation is otherwise not discussed in Chapter 4, but the colour use was different between the two help functions and needs to be included in the following discussion.

4   Developing Symbianhelp

In this chapter, I will look at the five issues identified in my expert evaluation in more detail from different points of view.

4.1   Access, orientation and exit

Access is the first item that must be considered when developing an improved help. "Access to the information we create, regardless of the medium is an essential tenet of effective technical communication", Barnum et al. state (2004: 185). Currently, the context-sensitive help topics in the Symbian OS are opened using the Options list in the applications, as mentioned in Chapter 3. Horton comments that additional steps subtract portions of the audience (1990: 57), and that applies here as well. It could even be asked if it is too much for the users to press Options, scroll to Help, and press the scroll key to open a help topic; the user has to complete three steps before the help topic opens. To get the users to the help topic faster, it could be considered whether adding a question mark icon in one corner of the dialog would be a good solution. Tapping or otherwise selecting the icon could then open a help topic. There would be only one step. The question mark icon could be found right next to the difficult settings and this way it would be easy to see and use. It would also be familiar from many Windows applications.

The problem with the question mark is that the small UI's of the smartphones are already quite crowded with different icons, texts, fields and process animations. The question mark icon would be

one more thing to place on the UI. Naturally, it must be checked that the selected icons are global, or remembered that they are regionalised or localised. Still, this would be normal UI design – similarly, the Options menu texts would need to be translated. Therefore, further studies regarding the question mark icon could be done. However, it should be kept in mind that at some stage the field-level context-sensitive What's This help could become a better option than a dialog-level context-sensitive help which Symbianhelp currently is. As described earlier, What's This? help is a help where the users first click a question mark icon and then the problematic area in a dialog. Therefore adding the question mark icon could cause misunderstandings, as most computer-savvy users might expect that the question mark icon in a dialog works similarly to the What's This help in Windows.

No matter how the help is opened, it can be assumed that the users would prefer an access point that is next to their task. As already reported, Grayling found out that users were willing to use an embedded help instead of a separate help window (2002: 193, 208). This could be studied in a user study with a simple paper prototype, for example, but there are certain questions that are worth thinking about. For example, if the users have a problem with one of the settings in a dialog, will they realise that they could get immediate instructions by selecting Options? It may not be clear to everyone that Help is one of the options that are found in the Options menu. It could also be assumed that users who concentrate on something very hard will ignore the surrounding areas, areas such as Options menus and keyboards.

The users' assumed tendency to concentrate on something and ignore the surrounding areas also has an effect on moving between the help topics and the application (Hackos and Stevens, 1997: 273).

Hackos and Stevens say that flipping between the two should not be required (ibid.), but on a Symbian device it is impossible to have the help topic and the application on the display at the same time, because there is no space for that, as discussed in Chapter 2. The best solution could be to include some kind of a "Switch to" link or button in the UI of the help application, or to have a specific hardware key for switching between help and an application. Currently, the menu key can be used to switch between open applications, and it can also be used for switching between help and an application.

In a way, the menu key is like the Home button in a browser. It always returns the user to a starting point, no matter where they are. A similar function should be implemented in the improved help. Having a home button would aid the users in orientating themselves in the help. As described in Chapter 2 and by Fillion and Boyle, in hypertext documents the users may feel uncomfortable and feel like they have lost control of the device. Uncomfortability is further increased because information can be hard to find in hypertext documents and reading sequences are unpredictable (Horton, 1990: 306). Hackos and Stevens recommend that users should have a home base (1997: 258), for example some help topic that they could return to if they start feeling lost. This "home page" could be accessed using an icon in the help application, similar to the home page icons in normal Web browsers.

There should also be navigational instructions and signposts in the help topics. Horton suggests displaying the topic name and path to it, giving a position number to each topic, and showing a roadmap of the document (1990: 123-124). I will discuss numbering and grouping in the following section. Similarly, stating the connection of the help topic and its application clearly in the help

topic title and "purpose statement" that follows the title (Hackos and Stevens 1997: 227) would help the users orientate themselves. On Symbian displays, however, the topic titles cannot be very long or detailed, because then they would not fit on the display, and a purpose statement could well be one screen of text that the users who open the help topic context-sensitively must scroll through before getting to the actual instructions. Therefore the advantages and disadvantages of this approach will have to be carefully weighted.

Both current Symbianhelp and Windows Mobile help are context-sensitive, and it is a good idea to keep context-sensitivity in the improved help as well. This decision will affect access, orientation and exit. I have already mentioned Grayling, who hypothesised that users will use a help that is non-intrusive, meaning that it opens only when the user requests it and does not draw the users' attention from their work (2002: 196). There are at least three different options for the level of context-sensitivity in the improved help. The first option would be to continue with the current Symbianhelp level: one help topic for each view or dialog. It is very detailed and should offer comprehensive support to the user, but is also error-prone because of the number of files and help topics. The second option would be to limit the number of help topics and not go to such depth in context-sensitivity. Instead of opening a separate help topic for each view or dialog, there could be only one help topic with links to new pages containing possible tasks from the view or dialog. A third option would be to have a single help topic with expandable links[4]. The users would select a link, but instead of moving to another page, the explanation would open on the same page. This option would also need to be thoroughly designed, as it is important to clearly distinguish between

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[4] Expandable links are links where only the heading is visible as a link, and when the link is clicked, the whole text opens for reading.

actions that move within a topic and those that jump to another topic (Petrauskas, 1987, as quoted in Horton, 1990: 73). I will return to link behaviour later in this chapter.

After the users have opened the help, they need to be able navigate between the help topics. In the current Symbianhelp, it is done using the table of contents. In the improved help, the table of contents should still remain an important navigational function. However, it should not be the only one. Briggs recommends that the users are offered alternative navigation methods, and as an example, she shows the help of Macromedia Dreamweaver where the users can use the table of contents and the back and forward buttons in the help topic to move in the help application (2003). The back and forward buttons would be worth considering also in the improved help, in that they would be immediately accessible for the user. Naturally, space permitting, a table of contents button would be a useful addition, too. This would also help the users orientate themselves.

With or without a table of contents button, the order of items in the table of contents needs to be decided. In the current Symbianhelp, the table of contents is automatically created. This has both advantages and disadvantages. One of the advantages is that because the table of contents is generated automatically, more emphasis can be placed on the quality of the help category and help topic titles instead of organising them to a suitable order. One of the disadvantages is that because ordering is automatic, there is little that can be done to have a help topic such as "About the Application" as the first topic under a category.

Current Symbianhelp uses automatic alphabetical ordering in the table of contents and indexes, and that is one of the most common ways information is organised. The users should know how to use

alphabetical lists, but alphabetical lists are usable only when users know what they are looking for. Information could also be grouped by functions, but no matter what the grouping order, a long list is unwieldy. (Hackos and Stevens, 1997: 122-124.) The table of contents is long in the current Symbianhelp and it can be expected that the table of contents will be long in the improved help as well. This is of course caused by the number of applications in Symbian OS; almost all applications have at least one help category in the table of contents.

Another way to organise the table of contents is sequential grouping, which is not quite as common as alphabetical grouping. Help writers need to work hard to make the sequence obvious, and users are likely to jump in the middle of a sequence. This is a concern especially in help functions with hyperlink navigation. In logical grouping, the structure is driven by the nature of the subject matter itself, meaning the partitioning and grouping of topics and subtopics that comes from the internal logic of the subject. (Hackos and Stevens, 1997: 126-128.) The problem with logical grouping such as chronological grouping is that the grouping may be meaningful to the information designer but not the users (Hackos and Stevens, 1997: 130). Finally, Hackos and Stevens suggest that grouping could be based on information that is used most frequently, but they also ask what happens to those users who only access the system for the less common problems (ibid.).

In the improved help, it could make sense to number the help topic titles. For example, a help topic title such as "About the Application" could be "1. About the Application" in the improved help. This way, it should always appear as the first help topic, no matter what the language. This kind of help topic numbering was not used in the studied Symbianhelp or Windows Mobile help. However, in the current Symbianhelp, the help topics have a running number, as can be seen in the top right-

hand corner of Figure 15. This 3/7

numbering means that there are 7 help topics

in the category and the user is viewing the

third topic. This same convention could be

used in the improved help as well, but should

help topic titles be numbered, the
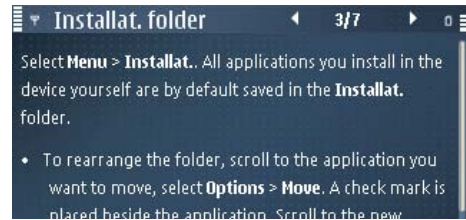
Figure 15: Numbering in a help topic

combination could lead into too many numbers for one help topic. Instead of helping, this kind of

double numbering could confuse the users. However, should the running numbers remain, a

solution similar to help topic title numbering could be built with metadata. The help topic that is

deemed most important could be tagged with some kind of "this topic first" tag. It would just have

to be ensured that the help application sorts the numbers in the correct order or understands the

metadata.

Another area which is worth assessing is quick exit from a help topic. As Nielsen comments, the

users should be able to exit any situation without going through extended interaction with a

program (1993: 138-139). Therefore the exit from the help topic should be clearly marked, and this

exit option should always be available. One possibility would be to have a Close or Exit button or a

Windows-like [X] button in the help. Again, it can be asked whether a [X] button would resemble

the Windows functionality too much, but on the other hand, its meaning should be understandable

to a large number of the smartphone users.

4.2 Search

As already discussed, users have different preferences in finding information. In his research, Nielsen has found out that slightly more than half of all users are search-dominant, about a fifth of the users are link-dominant, and the rest exhibit mixed behaviour (2000: 224). Even though Nielsen studied website usability, his results can be used to confirm that search is an important part of a help function because they resemble a website. Therefore putting effort into developing a good search should be justified.

There are several different search concepts, such as keyword search, full-text search, Boolean search, and natural language search. In the Symbian S60[5], only keyword search is available in the help at the moment, as described in Chapter 3. In this case, the index items form the list of the searchable items, and the users need to use the index items as the search queries. This may not always bring the desired results, as the users would need to know the exact terms used in the index, and as already reported in Chapter 2, "the probability of having two people apply the same name to an object is between 7% and 18%" (Nielsen, 1993: 12). Therefore, keyword search should not be the only available search mechanism. As one user could want keyword search and the other full-text search, both search mechanisms should be available in the improved help.

There are more decisions to be made with the full-text search. According to Hackos and Stevens, there are actually three different full-text search mechanisms: some systems list the help topics,

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[5] There used to be another Symbian platform version, S80, and that had full-text search.

some show the searched word and a portion of the surrounding text, and some take the user simply to the topic (1997: 244-245). The keyword search in the current Symbianhelp lists the help topics as the search result, if there are several help topics attached to the same index item, and take the user directly to the help topic if there is only one help topic attached to the index item. This would probably be a good choice even for the full-text search because the display space is limited. If the displays were bigger, then perhaps the search results could show the searched word and a portion of the surrounding text. This would help the users evaluate which one of the search results is the one they are looking for.

Where keyword search and full-text search are search types, Boolean search is more like an auxiliary search mechanism that can be used in both. Boolean search should work well especially with full-text search, where the amount of searchable text is larger. Boolean search is a search that allows users form advanced search queries using the Boolean operators AND, OR, and NOT (Usability First: Usability Glossary, 2002A). In the current Symbianhelp, the search function does not support Boolean search. Boolean search is a very advanced search and even though it is something that could be considered for the improved help, but it must be remembered that not all users know how to make a Boolean search. Nielsen, for example, recommends that Boolean search should be avoided in the basic search feature because non-technical users simply cannot use it correctly (2000: 227). He does, however, say that Boolean search and all "fancy" search methods could be placed on some sort of an advanced search page with "an intimidating title that scares novice users away" (ibid.).

An alternative for Boolean search would be natural language search. Natural language search is a

search that allows the user to enter the search query using normal language rather than special search terms. An example of natural language search would be "How can I make my device visible in Bluetooth search?" Natural language queries are rarely optimal because novices do not get what they expect when they use ambiguous queries and experts can usually specify a search more accurately and efficiently with a special-purpose syntax (Usability First: Usability Glossary, 2002B). However, natural language search may be too complex to implement when compared to the benefits. Horton reports that natural language search can work, if it is restricted to a well-defined domain, users understand the structure and vocabulary of the document, and they use it frequently enough to learn and remember its restrictions (1994: 84-85).

Other common features of search mechanisms are the support of wildcards, case insensitivity and searches on the results of the previous search (Hackos and Stevens, 1997: 245-246). First, wildcards are usually the asterisk or question mark characters which are inserted in a search query. For example, searching for ho*se or ho?se could list house or horse as the search result. This is something that could be allowed in the improved help, even though its usefulness in the restricted context of the Symbian OS may not be immediately clear. Second, the search must be case insensitive. Case-insensitivity means that the search handles search queries such as Messaging and messaging in the same way, despite that one is entered with a capital M and the other is not. When the users are entering text with their smartphone, for example while travelling, it can be easy to make typing errors. In addition, the users may not want to use capital letters especially if they need to press several keys to enter a capital letter. Third, the search function should save the results of previously viewed help topics in a search history list. Implementing a search history list seems to be well supported by research. I discussed Kamvar and Baluja's refinements already in Chapter 2, and

in addition, Horton reports that most searching is re-searching (1994: 70). These are two different searches, as refinements are new queries based on the found results, but Horton's re-searching means searching for the same term or item again.

4.3 Index

Together with search, having an index is an important feature in the improved help. Indexes should be readily accessible (Hackos and Stevens, 1997: 243), possibly accessible from every help topic, as they are even now in the current Symbianhelp. Naturally, the index should also be comprehensive and could contain important words from the help topic headings, known synonyms and even competitor terms (Hackos and Stevens, 1997: 239). It could even be feasible to collect the terms that the users really use in a user study and add them to the index as keywords. Hackos and Stevens also recommend using detailed and unique primary entries, such as "printing from a Macintosh" or "printing reports" (1997: 240). In Symbian devices, detailed index items are difficult, as once again the display size comes into the picture: very detailed index items do not fit on the display, and if they are only partially visible, they can be potentially misleading.

A completely new item in the index of the improved help would be nontextual items such as video, graphics or sounds (Hackos and Stevens, 1997: 241) as the current Symbianhelp does not support these. Horton notes that nontextual items should be indexed by media-specific characteristics, such as the running time of music or animation (1994: 281). The usefulness of indexing by the media-specific characteristics will have to be very carefully assessed against the effort of keeping these indexes up-to-date in all languages and versions.

Barnum et al. complain that indexes are often left out of electronic documentation because there is a belief that the users can equally well use a full-text search to access the information. They remind us that the search function frequently produces hundreds of results. (2000: 185.) This is a clear problem in full-text search, as too many results may make the user abandon the search because it takes too much time to sort through the results and find the best one, especially on a small smartphone display. Therefore it must be carefully planned how the search and index functions work together, and the index should not be left out from the improved help even if it would have a full-text search.

4.4 Hyperlinks

Hyperlinks were one of the main navigation methods in the Windows Mobile help, functioning as "navigational pathways connecting topics", as Horton says (1990: 103). Hyperlinks would ease navigating and also finding information on a small display, and they would allow the help to provide information for both expert and novice users. Hackos and Stevens have also found out that the users say that they prefer smaller documents, but at the same time, they want all the information needed to support a task in one place (1997: 8). This kind of behaviour is supported by hyperlinks as well, as the help topics can be shorter and the hyperlinks can lead to related topics. Finally, Hackos and Stevens compliment links by saying that they "acknowledge the idiosyncratic reading habits of our users while attempting to guide them through online information that lacks the signposts that they have always relied on in books" (1997: 135).

There are six basic types of hyperlinks:

- Links between HTML pages

- Links within an HTML page

- Links to bookmarks on an HTML page

- Links to e-mail addresses

- Links to files on HTML pages

- Links to File Transfer Protocol (FTP) Sites

(Teach Yourself HTML Visually, 1999: 120-133.)

Of these six, four could be used in the improved help: links between HTML pages, links within HTML pages, links to bookmarks on HTML pages, and links to files on HTML pages. Links between and within HTML pages and to bookmarks on HTML pages could be used for navigation from one help topic to another, and links to files could be used to enhance the help function with different multimedia content. The remaining two, links to e-mail addresses and links to FTP sites are more questionable. Links to e-mail addresses could be used for sending e-mail to different support addresses, but the whole process would need to be very carefully planned. Links to FTP sites are probably something that for security reasons should not be used.

In the web, hyperlinks can open the link target on top of the old page or in another window. With help topics, they would most likely open on top of the previous help topic as opening a hyperlink (leading to another help topic) to another window could lead into problems with system performance and memory capacity. However, pop-ups could be used for defining difficult concepts such as the e-mail standards POP3 and IMAP4. This is what Hackos and Stevens recommend,

saying that pop-up definitions, even though they are accessed through hypertext jumps, allow the users to say on the same screen and see a short definition without jumping somewhere else in the help function (1997: 61). Using pop-ups inside the help topics would also free space, as some of the more complicated concepts could be described "outside" the actual help topic. Those users who already know the concept could ignore the explanation, and those who do not know it, could read it from the pop-up. Hackos and Stevens think that pop-ups allow the users to investigate many aspects of a complex subject within one context (1997: 134). However, pop-ups cannot be indexed or defined in browser paths, so there is no way of ensuring that the users read them. The upside to pop-ups is that they keep the users in the "context of the primary topic" and prevent users from getting lost among the help topics. (1997: 141-142.)

To help the users keep track of where they have and have not been, all hyperlinks should change colour as they do in regular browsers. Standard web browser colours should be used with hyperlinks in the improved help as well: non-visited links should be blue, visited links should be purple. If non-standard hyperlink colours are used, users lose the ability to clearly see where they have and have not been. Their sense of structure and location is weakened, and others select the same hyperlink repeatedly while others give up thinking they have already read everything there is to read. (Nielsen, 2000: 62-63.)

To enable the users to find the most important items again and to make the improved help interactive, the user could even be given the possibility to modify the help. For example, Horton lists three ways users could adapt the help to their own behaviour: 1) add links between existing topics, 2) add new topics and create links to them, and 3) edit or even delete existing topics (1990:

77). This would be usable as the users could link to help topics that better match their queries or instruct in items that they most often need to check. A little less radical approach would be bookmarking, which would lead to the same result, and which should be a familiar concept for the users as it is one of the basic features in browsers.

Another basic browser feature is breadcrumbs. Breadcrumbs are navigational links which are usually located at the top of the page and show users the path they have taken after leaving the home page. Hackos and Stevens recommend that the users should be able to leave breadcrumbs, for example by marking topics that they access frequently. (1997: 259-263.) In the case of the improved help, a bookmark or a history list seems to be the only way that a user can leave breadcrumbs, because they cannot add links to the UI. In addition, Horton recommends that the help function should offer the users the option of leaving a bookmark when they are leaving (1994: 71). This may not be that necessary in the improved help, as leaving a bookmark when leaving the system seems to be a feature needed in large help functions or tutorials that the users are browsing from start to finish.

As described, hyperlinks have several uses, and it is usually simple to add hyperlinks to help topics. However, Hackos and Stevens note that this simple task is among the most difficult for new help designers. Links provide navigational options to the users, but too many might allow the users to become lost, and too few might keep them from finding the information that the users need. (Hackos and Stevens, 1997: 133.) With their comment Hackos and Stevens mean that new help designers may add too many hyperlinks just because they have the possibility to add them. In addition, Horton warns that jumping between the help topics is too time-consuming for those users

who are seeking specific reference information (1990: 308). Hackos and Stevens agree, and state that hypermedia is simply too undirected for the business world (1997: 133). I agree with this, because it is easy to get stuck jumping from hyperlink to hyperlink when trying to find an answer to a problem. Therefore, the use of hyperlinks must be carefully coordinated in the improved help. Hypertext should be used as a spice, and the number of links should be moderate (Horton, 1990: 309-310).

To avoid the number of links growing out of control, it is recommendable to have clear use cases for hyperlinks. Hackos and Stevens give the following as reasons for using hyperlinks:

1. To address different audiences. Terminology definitions or elaborate details of a step could be placed behind hyperlinks. These hyperlinks could move the user to another help topic or open in a pop-up window. Hackos and Stevens also suggest the use of expandable hyperlinks where clicking a hyperlink opens additional text after or below the hyperlink. Expandable hyperlinks can be used in procedural text to provide more detailed instructions to help less experienced users. (1997: 136, 142.)

2. To point to related information. The users can open an incorrect help topic very easily in context-sensitive help functions. Therefore, a help topic describing the company policy on travel expenses could include a related topics reference to entertainment expenses. (1997: 136-138.) For example, in S60 devices one help topic opens from the main Messaging view, and another one opens from the Drafts folder view in the main Messaging view, and a related topics link could be added between the two help topics.

3. To control help topic size and appearance. Often, new users do not understand that they need to

scroll a help topic because they do not understand the scroll bars. Hyperlinks could be used to break information down into smaller sections so that the need to scroll would be minimised. (1997: 139.)

4. To link to common help topics. Definitions or high-level information could be written into separate topics or pop-ups and linked to several help topics. (1997: 139.)

5. To display graphics or to zoom in on graphics. If display space or speed is a special concern, graphics could be linked to the help topics instead of embedding them in the help topics. (1997: 139.) Symbian devices have a small display, so this could be usable in the improved help. The help topics could include a smaller version, and tapping it or selecting it with some other method could open it in a pop-up window as a larger version.

Looking at the list of Hackos and Stevens, it is clear that the use of links needs to be carefully planned and instructions created before enabling their use in help.

Despite the multiple uses of hyperlinks, it must be remembered that they are not the only issues that influence the usability of helps. The organisation of a document has a strong influence on how well the reader understands and is able to use the information. If a document is well organised with headings, lists, and key words that trigger a reader's memory of prior knowledge of the subject, a reader can learn and use new information effectively. (Reep, 1997: 62.) However, studying the organisation of help topics and their effect on usability is a subject for another study.

4.5 Electronic augmentation

As was seen in the evaluation, the help functions did not use a lot of colour, graphics or multimedia. These three could be considered visual enhancements to the textual content, and adding a considerate amount of each could make the help topics more interesting, and make it easier to explain difficult concepts. Even though colour, graphics and even multimedia are relatively simple to add into helps, their usage too needs to be planned.

Colours should not be used just for the sake of using them and there should not be too many colours. It is also best to apply colours consistently. (Nielsen, 1993: 119.) If used sparingly, colour is an attention grabber. Each colour needs a purpose and too many colours force the users to spend more time trying to decipher the meaning of the colours instead of reading the information. (Hackos and Stevens, 1997: 220.) Colours should be used to categorise, differentiate, and highlight information (Nielsen, 1993: 120). They should also emphasise scanning targets because that is how users deal with an online document (Horton, 1994: 252, 273). Every colour should be functional, and colour coding should be used, for example, to speed up search (Horton, 1990: 163-164). In the improved help, there could be various uses for colours. For example, colours could be used for pointing out new or changed functionalities or safety information.

However, it must also be made sure that the help can be used without the colours (Horton, 1994: 244-245). For example, an item that is going to be deleted could turn red for users with full colour vision, and also be marked with a cross for users with visual impairments (Nielsen, 1993: 119). Similarly, colours must not compromise legibility (Horton, 1994: 244-245). This is especially

challenging because the themes of the smartphone can be changed, and this means that both the font and background colour can change. All colour combinations need to be tested, but it must be remembered that the users can create their own themes, and in that case there is little that can be done to ensure that the fonts are legible. Naturally, the needs of elderly users must also be taken into consideration when designing colour usage. However, in this case the font size is perhaps even more important than the font colour itself. In addition, colours may have a different meaning in different regions. For example, red means "warning" in the West but "happiness" in the east (Hackos and Stevens, 1997: 220). All this makes colour selection in global products demanding.

In addition to colour, graphics could be used in the improved help. For example, graphics could be used to communicate, clarify, and highlight important points (Horton, 1990: 176). Certain types of graphics could be useful in the improved help. There is no need for screenshots in helps because the users can see the UI in front of them, and mechanical drawings would probably also be unnecessary. Most useful graphics would probably be UI icons, and those are what Hackos and Stevens recommend as well (1997: 306). Also Briggs suggests that icons should be used instead of text (2003). UI icons could help the users make the connection between an application and its help topics, so that they could better put into use what they have read in the help. UI icons could also be used for example in the menu paths that show where a certain task can be done.

In addition, graphics could be used to maintain interest and to entertain (Hackos and Stevens 1997: 308-310), or to motivate and attract users (Horton, 1990: 177). The idea is good, but I believe that smartphone helps will never have enough space or dedicated device memory to include graphics which do not serve a specific purpose. At the same time, the graphics should not merely decorate

and beautify, and they should be kept simple and made easily recognisable. In the end, even if graphics are used, the quality of text should never be forgotten. (Horton, 1990: 176.)

Even though colours and graphics could work on the small displays of the Symbian devices, multimedia is more questionable. In this case, multimedia means the use of sound and animation to present information. Sound is especially valuable for communicating additional information and alerting the users to special conditions, and designers should remember the needs of hearing-impaired users (Horton, 1990: 183). In my opinion, with the exception of reading the help topics aloud, sound alone does not work in Symbianhelp. There is little if no information in the help topics that would benefit from sound effects.

However, the situation is different with animations. People instinctively notice and attend to moving objects, and "information in motion" should be used to focus attention and to communicate dynamic concepts (Horton, 1990: 185-186). Complicated concepts, such as pairing two devices with Bluetooth, could well benefit from animation. Of course, there will always be memory constraints and size limitations. However, if the animation already exists on the device memory, the users do not have to wait while it loads over a network connection. Nielsen, who in 2005 stated that research on the usability of online video and other multimedia elements on websites had just started, commented then that the main guideline is to keep videos short (2005A). This can also be applied to animations used in helps. The key idea is to balance cost, effectiveness, usefulness, and file size. Small but important details should not go unnoticed or unrecognised because users are distracted by the effects. (Hackos and Stevens, 1997: 327-329.)

Finally, it must be remembered that the downside of using multimedia is poor performance. If the help topics are full of graphics, animations and sound, they can be entertaining, motivating and fun to read. At the same time, graphics, animations and sound can slow down the performance of the help application, which can quickly lead to irritation. If irritation is the end result, it does not matter how improved the help is otherwise.

5 Conclusions

The purpose of this study was to evaluate the help functions in the Symbian OS and Windows Mobile OS and use the evaluation results to examine what kind of improvements could be done to the help function in the Symbian OS. For the evaluation method I selected expert evaluation, and for the purposes of this study, I think it worked well. As pointed out in the Foreword, the idea in this study was not to find all usability problems in one help function, but to compare two different help functions. However, as was also pointed out, expert evaluation does not include the end-user, and being able to collect the opinions of real users would have brought another level of understanding to my findings. This, perhaps, would be a good starting point for further study.

As the basis of my expert evaluation, I used Fillion and Boyle's categories from 1991. As helps resemble websites in that there is nothing concrete for the user to use as a home base or a navigational aid, it made sense to select usability heuristics that reflect this specialty. Fillion and Boyle's categories are based on the usability of hypertext documents and their list contains nine items: 1) Orientation, 2) Interface and Presentation, 3) Search, 4) Navigation, 5) Index, 6) Links, 7) Literary Paradigm, 8) Electronic Augmentation and 9) Customisation and Personalisation. It could be argued that these heuristics are old and "hypertext documentation" has developed a great deal since 1991, but I think that the underlying problems are still the same and that it is always beneficial to go back to the basics and ensure that they are correct before moving on to more advanced features. Fillion and Boyle's categories proved to be a useful tool in evaluating the two help smartphone applications.

However, there are other heuristics, as mentioned in Chapter 3. These were the heuristics of

Nielsen, Purho and DeBoard. Nielsen's heuristics stem from UI design, Purho's heuristics are based

on Nielsen's but start from documentation, and DeBoard's heuristics are based on the ISO 9241

standard, and as was mentioned, all three have related items. It would have been interesting to

combine these three with Fillion and Boyle's heuristics and form my own set of heuristics

specifically designed for smartphone helps.

My initial assumption was that easing navigation between the help topics would lessen the need to

contact colleagues and call centre services, thus saving time and money. While carrying out the

expert evaluation, I realised that the initial assumption cannot be validated using expert evaluation.

To be able to completely validate the assumption, I would have needed to do a usability test with

real users. However, the expert evaluation did reveal that the Windows Mobile help includes

different types of hyperlinks that are used as related topics links and regular links between the help

topics, as well as back and forward buttons and a table of contents button. This eases navigation and

aids in finding information from the help topics. In addition, I found out that the Windows Mobile

help uses colours and graphics to convey information, which was something that Symbianhelp did

not do. Neither help included multimedia, which is understandable considering the smartphone

memory restraints.

Both Symbianhelp and Windows Mobile help were context-sensitive and had a search function, but

only Symbianhelp had an index, which according to Fillion and Boyle is a mandatory

complementary tool to the search mechanism. Windows Mobile help, on the other hand, included

navigation buttons on the display, which helps the users in both navigation and orientation. The

expert evaluation results led me to examine five development issues in more detail, because they are either very important or very different between the two help functions. The issues were 1) access, orientation, and exit, 2) search, 3) index, 4) hyperlinks, and 4) electronic augmentation.

Access, orientation, and exit are the first items that need to be contemplated in help development. Before the users can use the help, they need to open it. Currently, Symbianhelp is opened using an Options list command, but other solutions such as the question mark help icon could be considered as well. In any case, it could be recommended that the access to help needs to be as easy and as close to the users' task as possible. After the help is opened, the users need to orientate themselves, i.e., find out where they are and where they should be going. Here, a table of contents, an index, a home icon, or back and forward buttons as in the Windows Mobile help would be worth thinking about. After the users have found what they have been looking for, they need a quick exit. A Close or Exit button or Windows-like [X] are examples of the suitable options.

A table of contents is a navigational method, but it should not be the only one. Back and forward buttons could also be used for navigation. It is also worth thinking about the organisation and grouping of the table of contents. Organisation could be manual or automatic, and the order alphabetic, sequential, logical, functional or even chronological. However, the problem with manually organising the table of contents is that the user and the author will not have the same logic and the user may not be able to understand the organisation. Therefore the best solution would be to select the most usual one, such as the alphabetic organisation, as that should be well known to most users.

Research has shown that the users have different preferences on finding information, and that the slight majority is search-dominant. There are different search concepts, such as keyword search, full-text search, Boolean search, and natural language search. Of these, Boolean search and natural language search may be too complex for a smartphone help function, but the two others are worth considering. It could even be beneficial to have both of them. Re-searching and search refinements are among the most used search mechanisms, and implementing a search history list seems to be well supported by research. Index, which in Fillion and Boyle's opinion must always be implemented as a complement to search, would be an important feature in the improved help as well. In addition to regular index items, new index items such as media-specific characteristics of video, graphics and sounds could also be added to the improved help.

Hyperlinks were one of the main features of the Windows Mobile help, and would be useful also in the improved help. Of six different link types, four could be used in the improved help: links between HTML pages, links within HTML pages, links to bookmarks on HTML pages, and links to files on HTML pages. Links between and within HTML pages and to bookmarks on HTML pages could be used for navigation from one help topic to another, and links to files could be used to enhance the help topics with different multimedia content. In addition, pop-ups could be used for explaining difficult concepts without taking the users away from the help topic that they are reading. Standard browser functionality should also be considered. Standard browser colours should be used in hyperlinks, but it would also be beneficial to use breadcrumbs in the help topics and offer the users the possibility to bookmark the help topics that they visit often. Hyperlinks could be used to address different audiences, to point out related information and to control help topic size and appearance, for example.

As seen in the expert evaluation, the helps did not use a lot of colours, graphics or multimedia. Symbianhelp did not use any of the three, but Windows Mobile help used colours and graphics to some extent. Adding these is quite simple, but should be carefully planned. Each colour needs a purpose and the users should not be forced to spend time deciphering what the colours mean. It should always be remembered that it must be possible to use the help without the colours. As for graphics, UI icons and key graphics could be usable in the improved help. Both Hackos and Stevens and Horton suggest that graphics should be used to motivate, attract and entertain. However, it is unlikely that smartphone helps will ever have enough display space or memory for anything else than graphics that have a specific purpose. Also, multimedia was not used in Symbianhelp or Windows Mobile help, but in the future, some multimedia could be introduced in the improved help. For example, animations could be used to explain difficult concepts. In the end, adding colours, graphics and multimedia needs to be considered from the cost, effect and usability point of views, but it must not be forgotten that especially graphics and multimedia may actually work against the purpose of building an improved help. Even though hyperlinks would ease navigation and graphics and multimedia would make help topics more interesting, the combination of these could slow down the help so that frustration of not finding the desired information could turn into frustration for not getting the information open quickly enough.

To conclude, the smartphone helps must be briefly compared to computer helps. In Windows and Windows applications, helps are recognised as an essential part of the system. The helps are often reasonably well designed, quite advanced, and no longer hidden deep inside the applications. Simple, static helps have developed into help and support centres which are interactive and self-updating, able to track the users' actions and even offer assistance without the users' request after

noticing that the users are having problems. This could perhaps be the direction into which Symbianhelp should go as well. Developing Symbianhelp into complex help functions such as the help and support centres in Windows may be difficult, but researching the feasibility of this idea is a subject for a whole new study.

Finally, it should also be noted that the discussion in Chapter 4 is not restricted to any specific help function. The suggested development ideas can be applied to Symbianhelp, but they can as easily be applied to any other help application. This is what I hoped to see: the results can be used in help development in general, and they do not assume a certain setup to work. For example, an idea that would be worth considering is the development of a browser-based help to the Symbian OS. Browser-based helps are helps that are viewed on browsers. The availability of a browser in all Symbian OS smartphones and the current strategic direction of Nokia as an "internet company" could lead to development efforts being put towards a browser-based help instead of trying to implement hyperlinks and other enhancements to Symbianhelp. With a browser-based help, other web design principles could be used as well, making use of existing web-related studies and experiences of web design on small screens. Browser-based helps would even enable the use of new social web technologies, which are another new trend in technical communication. Ultimately, there are still several questions to answer and items to research in smartphone helps, and hopefully this study has paved the way for several to come.

6 References

Briggs, Louise. "What is Usable Help?" A Presentation at the STC Twin Cities Chapter Usability SIG meeting, November 2003. URL: <www.sstctc.org/documents/WHAT%20IS%20USABLE%20HELPweb.pdf >. [Accessed 20 March 2005]

Barnum, Carol et al.: "Index Versus Full-text Search: A Usability Study of User Preference and Performance" in *Technical Communication*, 2004, Vol. 51, No. 2. 185-206.

Charney, Davida H., Lynne M. Reder, and Gail W. Wells. "Studies of Elaboration in Instructional Texts" in Stephen Doheny-Farina (Ed.), *Effective documentation: What We Have Learned from Research*. Cambridge: Mass.: The MIT Press, 1988. 47-72.

Coe, Marlana: *Human Factors for Technical Communicators*. New York: John Wiley & Sons, Inc., 1996.

DeBoard, Donn: "Heuristics to Evaluate Online Help." STC Usability SIG, Usability Interface Newsletter, Vol 10, No 3. January 2004. URL: <http://www.stcsig.org/usability/newsletter/0401-heuristics.html>. [Accessed 26 January 2008]

DeLoach, Scott: "Developing Embedded User Assistance for Web-based Applications". A presentation at the WritersUA Conference for Software User Assistance, Hollywood, Los Angeles, on 30 March 2004.

Farkas, David K.: "The role of balloon help" in *ACM SIGDOC Asterisk Journal of Computer Documentation*, 1993, Vol. 17, Issue 2. 3-19.

Fillion, Florence M. and Craig C.D. Boyle: "Important issues in hypertext documentation usability". Proceedings of the 9th annual international conference on Systems documentation, 1991. 59-66.

Gery, Gloria: "Performance Centered Design". A presentation at the Performance Support '99 Conference. Los Angeles, 1999. URL: <http://files.epsscentral.info/gery/presentations/PS99_workshop.ppt>. [Accessed 13 January 2008]

Grayling, Trevor: "If We Build It, Will They Come? A Usability Test of Two Browser-based Embedded Help Systems." in *Technical Communication*, 2002, Vol. 29, No. 2. 193-209.

Hackos, Joann T. and Dawn Stevens: *Standards for Online Communication: Publishing Information for The Internet/World Wide Web/Help Systems/Corporate Intranets*. New York: John Wiley & Sons, Inc., 1997.

Ham, Dong-Han et al.: "Conceptual framework and models for identifying and organizing usability impact factors of mobile phones". Proceedings of the 20th conference of the CHISIG of Australia on Computer-human interaction, 2006. 261-268.

Hargis, Gretchen: "Readability and Computer Documentation" in *ACM Journal of Computer Documentation*, 2000, Vol. 24, No. 3. 122-131.

Horton, William K.: *Designing and Writing Online Documentation: Help Files to Hypertext*. New York: John Wiley & Sons, Inc., 1990.

- - - - - - - - : *Designing and Writing Online Documentation: Hypermedia for Self-Supporting Products*. New York: John Wiley & Sons, Inc.: 1994.

Huckin, Thomas N. and Leslie A. Olsen: *Technical Writing and Professional Communication for Non-native Speakers of English*. 2nd edition. New York: McGraw Hill, 1991.

James-Tanny, Char: "Context-sensitive Help". 2000.
    URL: <http://www.helpstuff.com/HelpCornerArchives/06-2000/hc6-00.htm>. [Accessed 13
    January 2008]

Kamvar, Maryam and Shumeet Baluja: "A large scale study of wireless search behavior:
    Google mobile search". Proceedings of the SIGCHI conference on Human Factors in
    computing systems, 2006. 701-709.

Karppinen, Jane and Laura Katajisto: A lecture in the 53rd Annual Conference of the Society
    for Technical Communication on 10 May 2006.

Kielilaki. 6.6.2003/423. URL: <http://www.finlex.fi/fi/laki/ajantasa/2003/20030423>. [Accessed 19
    January 2008]

Knowles Rubens, Brenda. "Similarities and Differences in Developing Effective Online and
    Hardcopy tutorial" in Stephen Doheny-Farina (Ed.), *Effective documentation: What We Have
    Learned from Research*. Cambridge, Mass.: The MIT Press, 1988. 159-184.

Kobayashi, Mei and Koichi Takeda: "Information retrieval on the web" in *ACM Computing
    Surveys*, 2000, Vol. 32, Issue 2. 144-173.

Koikkalainen, Tanja: *Single sourcing: a system for reusing information in documentation*. Master's
    thesis, University of Tampere, 2002

Koivumäki, Minna: *From linear to non-linear - On the adaptation of hypertext, usability, and
    minimal manual studies to the production of hypertext user guides*. Master's thesis, University
    of Tampere, 2000.

Korvenranta, Heta: "Asiantuntija-arvioinnit" in Soile Ovaska, A. Aula and P. Marjaranta (Eds.),
    Käytettävyystutkimuksen menetelmät, Tampereen yliopisto, Tietojenkäsittelytieteiden laitos B-
    2005-1, 2005. 111-124.

Kuluttajansuojalaki. 20.1.1978/38. URL: <http://www.finlex.fi/fi/laki/ajantasa/1978/19780038>.
    [Accessed 19 January 2008]

Kuluttajavirasto: "Tietoa käyttöohjeista yrityksille". URL: <http://www.kuluttajavirasto.fi/fi-
    FI/yritykselle/virhe/kayttoohjeet/>. [Accessed 19 January 2008]

Kärkkäinen, Lari and Jari Laarni: "Designing for small display screens". Proceedings of the second
    Nordic conference on Human-computer interaction, 2002. 227-230.

Lam, Heidi and Patrick Baudisch: "Summary thumbnails: readable overviews for small screen web
    browsers". Proceedings of the SIGCHI conference on Human factors in computing systems,
    2005. 681-690.

Lockett Zubak, Cheryl: "What is Embedded Help?" in *Intercom's Tools & Technology Issue*,
    March 2000. 18-21. URL: <http://www.stc.org/intercom/PDFs/2000/200003_18-21.pdf >.
    [Accessed 13 January 2008]

Loel, Kim and Michael J. Albers: "Web design issues when searching for information in a small
    screen display". Proceedings of the 19th annual international conference on Computer
    documentation, 2001. 193-200.

Market Share by Net Applications: "Market share for browsers, operating systems and search
    engines", 2007. URL: <http://marketshare.hitslink.com/report.aspx?qprid=8>. [Accessed 13 January
    2008]

Massimi, Michael, Ronald M. Baecker, Michael Wu: "Using participatory activities with seniors to
    critique, build, and evaluate mobile phones". Proceedings of the 9th international ACM
    SIGACCESS conference on Computers and accessibility, 2007. 155-162.

Molich, Rolf and Jakob Nielsen: "Improving a human-computer dialogue" in *Communications of
    the ACM*, 1990. Vol. 33, No. 3. 338-348.

Morkes, John and Jakob Nielsen: "Concise, SCANNABLE, and Objective: How to Write for the Web", 1997. URL: <http://www.useit.com/papers/webwriting/writing.html>. [Accessed 13 January 2008]

Nielsen, Jakob : *Usability Engineering*. San Diego: Morgan Kaufmann, 1993.

- - - - - - : "Why Web Users Scan Instead of Read", 1997.
    URL: <http://www.useit.com/alertbox/whyscanning.html>. [Accessed 17 February 2008]

- - - - - -: *Designing Web Usability*. Indianapolis: New Riders Publishing, 2000.

- - - - - - : "Talking-Head Video Is Boring Online", 2005A.
    URL: <http://www.useit.com/alertbox/video.html>. [Accessed 16 February 2008]

 - - - - - - : "Heuristics for User Interface Design: Ten Usability Heuristics", 2005B.
    URL: <http://www.useit.com/papers/heuristic/heuristic_list.html>. [Accessed 19 February 2008]

Palen, Leysia, Marilyn Salzman, Ed Youngs: "Going wireless: behavior & practice of new mobile phone users". Proceedings of the ACM conference on Computer supported cooperative work, 2000. 201-210.

Price, Jonathan and Henry Korman: *How to Communicate Technical Information: A Handbook of Software and Hardware Documentation*. Reading, Mass.: Addison-Wesley, 1993.

Purho, Vesa: "Heuristic Inspections for documentation – 10 Recommended Documentation Heuristics." STC Usability SIG, Usability Interface Newsletter, Vol 6, No 4. April 2000. URL: <http://www.stcsig.org/usability/newsletter/0004-docsheuristics.html>. [Accessed 13 January 2008]

Randall, Neil and Isabel Pedersen: "Who Exactly is Trying to Help Us? The Ethos of Help Systems in Popular Computer Applications". Proceedings of the 16th annual international conference on Computer documentation, 1998. 63-69.

Reep, Diana C.: *Technical Writing: Principles, Strategies, and Readings*. Needham Heights: Allyn & Bacon, 1997.

Salomaa, Teija: *Dokumentaation luettavuus ja ymmärrettävyys – useiden muuttujien summa*. Master's thesis, University of Tampere, 2004.

Symbian: "Symbian Fast Facts", 2007. URL: <http://www.symbian.com/about/fastfacts/fastfacts.html>. [Accessed 13 January 2008]

Teach Yourself HTML Visually. Foster City: IDG Books Worldwide, Inc., 1999.

Usability First: Usability Glossary: "Boolean search", 2002A.
    URL: <http://www.usabilityfirst.com/glossary/main.cgi?function=display_term&term_id=920>. [Accessed 6 February 2008]

Usability First: Usability Glossary: "natural language search query", 2002B.
    URL: <http://www.usabilityfirst.com/glossary/term_921.txl>. [Accessed 13 January 2008]

Utriainen, Hanna: *Usability Aspects in Single-Sourced Documentation*. Master's thesis, University of Tampere, 2004.

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Suomenkielinen lyhennelmä

Johdanto

Lisääntynyt liikkuvuus on asettanut uusia vaatimuksia teknisille laitteille. Puhelimet ja tietokoneet

ovat yhdistyneet älypuhelimiksi, jotka ovat kuin pieniä siirrettäviä toimistoja tai viihdekeskuksia.

Laitteiden tavoin myös niiden käyttäjätuen pitäisi olla kannettavaa. Yksi kannettavan käyttäjätuen

muodoista on laitteiden ohjetoiminnot. Ohjetoiminnot ovat yleisiä tietokoneissa, mutta niitä on

myös Symbian- ja Windows Mobile -käyttöjärjestelmää käyttävissä älypuhelimissa. Symbian-

käyttöjärjestelmä on ollut alusta asti käytössä älypuhelimissa, kun taas Windows Mobile on

erityisesti älypuhelimia ja kämmenmikroja varten kehitetty Windows-käyttöjärjestelmän versio.

Symbian-käyttöjärjestelmän ohjetoiminto, Symbianhelp, on kontekstisensitiivinen ohjetoiminto. Jos

käyttäjä ei löydä ratkaisua ongelmaansa siitä ohjeen aiheesta, joka kontekstista aukeaa, ei toisiin

ohjeen aiheisiin siirtyminen välttämättä ole kovin helppoa. Symbianhelp-ohjetoiminnon aiheet

muistuttavat verkkosivuja, sillä niissä ei ole mitään selkeää lähtökohtaa, josta käyttäjä voisi aloittaa

lisätiedon etsimisen. Symbianhelp-ohjetoimintoa pitäisikin kehittää niin, että ohjeen aiheesta

toiseen liikkuminen olisi helpompaa, ja tiedon löytäminen yksinkertaisempaa.

Tämän tutkimuksen tarkoituksena on arvioida kahden älypuhelimen ohjetoimintoja ja tarkastella,

millä tavoin Symbianhelp-ohjetoimintoa voitaisiin kehittää arvioinnissa esiin tulleiden löydösten

pohjalta. Tuloksia voidaan toivottavasti käyttää laajemminkin kuin vain Symbianhelp-ohje-

toiminnon kehittämisessä. Arviointimetodina käytän asiantuntija-arviointia, joka on yksi

käytettävyystutkimuksen metodeista. Asiantuntija-arviointi on nopea, kustannustehokas ja helppo

oppia. Asiantuntija-arvioinnin haittapuoli on se, että arviointiin ei osallistu loppukäyttäjiä, ja tästä

syystä tulokset saattavat olla hieman erilaiset kuin perinteisessä käytettävyystestauksessa.

(Korvenranta, 2005.) Asiantuntija-arviointi tuntuu sopivalta ohjetoimintojen arviointiin, koska

tarkoitus ei ole löytää yhden ohjetoiminnon kaikkia ongelmia, vaan arvioinnin avulla vertailla kahta

erilaista ohjetoimintoa ja selvittää, minkälaisia kehitysmahdollisuuksia tulokset tuovat esiin.

Arviointini aineistona ovat Symbian-laite **Nokia E61i** ja Windows Mobile -laite **i-mate K-JAM**.

Laitteiden ohjetoiminnot ovat varsin erilaiset. E61i:n ohjetoiminto on yksinkertainen ja tukee

käyttäjää useilla erilaisilla ohjeen aiheilla, kun taas i-mate K-JAM:in ohjetoiminto on kehittyneempi

ja hyödyntää hyperlinkkejä, joiden avulla käyttäjä voi löytää lisää tietoja. Arvioinnin apuna käytän

Florence Fillionin ja Craig Boylen kategorioita (1991).

Aiempi älypuhelinten tutkimus on keskittynyt laitteiden käytettävyyteen ja käyttöön, mutta myös

ohjetoimintoja, hypertekstiä ja pienten näyttöjen verkkosivusuunnittelua on tutkittu (katso

esimerkiksi Palen ym., 2000; Ham ym., 2006; Massimi ym., 2007; Loel ja Albers, 2001; Lam ja

Baudisch, 2005; Kärkkäinen ja Laarni, 2002; Farkas, 1993; Koivumäki, 2000). Älypuhelimia ja

ohjetoimintoja yhdistävää tutkimusta ei ole. Tämä tutkimus onkin alalla pioneerityö, ja vaikkei se

pro gradu -työnä voikaan olla kaikenkattava, on se ensimmäinen askel tällä tulevaisuudessa yhä

tärkeämmällä teknisen viestinnän tutkimusalueella.

Johdatus oppaisiin ja ohjeisiin

Painetut käyttöoppaat ja ohjetoiminnot eivät ole toistensa kilpailijoita, vaan ne tukevat toisiaan.

Molemmat tarvitaan, sillä myyntipakkauksen pienentyessä myös painettujen käyttöoppaiden

sivumääriä rajoitetaan, jolloin tieto täytyy tarjota käyttäjille jollain toisella tapaa. Onkin järkevää julkaista tieto laitteen ohjetoiminnossa, sillä tällöin ohje on aina laitteen mukana.

Suurimmat painetun käyttöoppaan ja ohjetoimintojen erot ovat 1) aloituksessa ja navigoinnissa, 2) kuluissa ja 3) aikatauluissa ja päivityksissä. Painetun käyttöoppaan kanssa aloitetaan ottamalla kirja käteen, ja sen jälkeen voidaan käyttää sisällysluetteloa, indeksiä ja kirjan sivujen selailemista navigointiin. Ohjetoimintojen kanssa käyttäjän on ensin tiedettävä, miten laitteessa oleva ohje-toiminto avataan, mutta sen jälkeen navigointimetodit ovat lähes samat kuin käyttöoppaassa. Navigointimetodeista haku on ohjetoimintojen erityispiirre. Käyttäjä voi ensin etsiä tietyllä hakusanalla, minkä jälkeen hän voi keskittyä tuloksiin. Kamvar ja Baluja totesivat tutkimuksessaan, että lähes 29 prosenttia kaikista hauista on edellisen haun tarkennusta (2006: 707). Täytyy kuitenkin muistaa, että Kamvarin ja Balujan käyttäjät hakivat laitteella tietoa internetistä, eivät ohjeen aiheista.

Niin painettujen käyttöoppaiden kuin ohjeen aiheiden tuottamiseen liittyy sisällöntuotanto-, käännätys-, lokalisointi-, painatus- ja testauskuluja. Kulut ovat osittain samoja, sillä sekä painetut käyttöoppaat että ohjeen aiheet täytyy kirjoittaa ja käännättää. Painetut käyttöoppaat täytyy tietysti painattaa. Horton arvioikin suurten yritysten käyttävän 5-15 prosenttia liikevaihdostaan paperidokumenttien luomiseen ja jakeluun (1994: 7). Ohjeen aiheet täytyy puolestaan testata, ja suurilla kielimäärillä tämä voi tulla varsin kalliiksi.

Edellä mainitut kuluja aiheuttavat vaiheet täytyy tietenkin aikatauluttaa. Painetut käyttöoppaat ja ohjetoiminnot noudattavat usein eri aikatauluja, mikä voi olla ongelmallista. Koska painettujen käyttöoppaiden julkaisuun ja painamiseen täytyy varata aikaa, ohjetoimintoa voidaan usein päivittää myöhemmin. Tästä huolimatta käännetyt ohjeen aiheet tarvitaan usein aiemmin kuin käännetty ja painettu käyttöopas. Tämä johtuu erilaisista integrointi- ja testauskierroksista, joita tarvitaan

ohjetoimintojen lisäämiseksi sovelluksiin. Tästä huolimatta ohjeen aiheita voidaan päivittää varsin myöhään, eikä niiden tarvitse kärsiä painetun käyttöoppaan suurimmasta ongelmasta, vanhentumisesta samana päivänä kun se painetaan (Hackos and Stevens, 1997: 4).

Ohjetoimintoja on monia erilaisia, mutta käytännössä ne voidaan jakaa integroituihin ja upotettuihin ohjetoimintoihin. Integroitu ohjetoiminto avataan sovelluksesta pieneen, erilliseen ikkunaan sovelluksen päälle. Toisinaan käyttäjä tarvitsee tietoa sekä ohjeen aiheesta että sovelluksesta, mutta sovelluksen päälle sijoittuessaan integroitu ohjetoiminto estää tämän ja käyttäjä saattaa esimerkiksi joutua kirjoittamaan ohjeet paperille voidakseen toimia oikein (Horton, 1990: 75). Upotetut ohjetoiminnot sen sijaan ovat yleensä aina auki ja osa sovelluksen käyttöliittymää. Ne voivat tarjota käyttäjälle ratkaisun ongelmaan jo ennen kuin käyttäjä sellaista huomaa, mutta ne myös vievät tilaa sovelluksen käyttöliittymästä (DeLoach, 2004). Aineistonani toimivat Symbianhelp- ja Windows Mobile -ohjetoiminnot ovat molemmat integroituja ohjetoimintoja.

Sekä integroidut että upotetut ohjetoiminnot voivat olla kontekstisensitiivisiä. Konteksti-sensitiivisissä ohjetoiminnoissa ohjeen aihe sisältää ohjeita ainoastaan sille näkymälle, josta se on avattu. Kontekstisensitiivinen ohjetoiminto voi olla näkyvissä koko ajan tai avattavissa tarpeen mukaan. Kontekstisensitiivisyys voi kuitenkin aiheuttaa ongelmia käyttäjille. Jos konteksti-sensitiivisesti avattu ohjeen aihe vastaa käyttäjän tilannetta, tarjottu tieto on heti hyödyllistä (Horton, 1990: 78). Näin ei kuitenkaan aina ole, sillä kontekstisensitiivisesti avattu ohjeen aihe voi antaa ohjeita johonkin toiseen tilanteeseen ja vastata johonkin muuhun kysymykseen kuin siihen, mikä käyttäjällä on. (Katso myös Nielsen, 1993: 32.) Ohjetoiminnon kannalta ohjeen aihe on oikea, mutta käyttäjä on väärässä kontekstissa. Käyttäjästä taas ohjetoiminto ei ole hyvä, sillä siitä puuttuu juuri se tähdellinen tieto, jota hän kaipaa..

Älypuhelinten ohjetoimintojen arviointi

Tuotekehityksessä älypuhelinten käytettävyyttä voidaan alkaa arvioida ja testata jo pelkkien luonnosten pohjalta erilaisia heuristiikkoja apuna käyttäen (Korvenranta, 2005: 113). Vaikka älypuhelimen ohjetoimintojen käytettävyys on yhtä tärkeää, sitä ei kuitenkaan voida arvioida samoilla heuristiikoilla kuin älypuhelinta (katso esim. Purho, 2000). Useimmin käytetyt käytettävyysheuristiikat tunnetaan nimellä Nielsenin lista (Korvenranta, 2005: 113). Nielsenin heuristiikat on kuitenkin kehitetty käyttöliittymien arviointiin. Purho kehitti heuristiikkansa dokumentaation arviointia varten Nielsenin listan pohjalta (2000), kun taas DeBoard kehitti ohjetoimintojen arviointiin tarkoitetut heuristiikkansa ISO 9241 -standardiin pohjautuen (2004).

Tässä tutkimuksessa käytän älypuhelinten ohjetoimintojen arviointiin kuitenkin Fillionin ja Boylen kategorioita (1991), sillä ne perustuvat hypertekstijärjestelmien tutkimukseen ja tästä syystä niitä voidaan soveltaa myös verkkosivuja muistuttaviin ohjetoimintoihin. Fillionin ja Boylen kategoriat ovat 1) orientaatio, 2) käyttöliittymä/esitysmuoto, 3) haku, 4) navigointi, 5) indeksi, 6) hyperlinkit, 7) tekstuaalinen paradigma, 8) multimediasisältö ja 9) kustomointi/personointi. Koska Fillionin ja Boylen kategoriat ovat toisiinsa kytköksissä, ei aina ole mahdollista tarkastella yhtä kategoriaa ilman, että samalla tarkastelee toistakin. Tästä syystä olenkin arviointiani varten ryhmitellyt kategoriat viiteen ryhmään: 1) orientaatio, navigointi, haku ja indeksi, 2) hyperlinkit, 3) tekstuaalinen paradigma ja käyttöliittymä/esitysmuoto, 4) multimediasisältö ja 5) kustomointi/personointi. Seuraavaksi käyn läpi kategorioiden sisällön ja arvioinnin tulokset.

Orientaatio, navigointi, haku ja indeksi

Orientaatiolla tarkoitetaan käyttäjän mielikuvaa sijainnistaan. Koska käyttäjä voi hyperlinkkejä käyttämällä liikkua kauas aloituskohdastaan, on tärkeää, että tarjolla on referenssipisteitä, joita voi käyttää suunnan löytämiseen. Referenssipisteet voivat olla myös navigointimetodeja, jotka

hyperlinkkien ohella auttavat käyttäjää siirtymään tehokkaasti ohjeen aiheesta toiseen. Haku on ohjetoimintojen erikoispiirre, ja sen tulisi olla tehokas ja toimiva. Hakua pitäisi aina täydentää indeksillä, jolle tulisi myös onnistua valitsemaan oikeanlainen esitysmuoto. (Fillion ja Boyle, 1991: 60-62.) Sekä Symbianhelp- että Windows Mobile -ohjetoiminto ovat kontekstisensitiivisiä. Symbianhelp-ohjetoiminnossa käyttäjä voi kartoittaa sijaintinsa ainoastaan avaamalla Valinnat-valikosta sisällysluettelon ja tarkastelemalla, mihin ohjekategoriaan hänen lukemansa ohjeen aihe kuuluu. Navigointi sisällysluettelon ja ohjeen aiheiden välillä tapahtuu Takaisin-näppäintä painamalla. Windows Mobile -ohjetoiminnossa käyttäjä voi hahmottaa sijaintiaan ohjeen aiheeseen liittyvien linkkien ja ohjesovelluksen käyttöliittymästä löytyvien sisällysluettelopainikkeen ja navigointipainikkeiden avulla. Symbianhelp-ohjetoiminnossa Valinnat-valikosta voi avata myös indeksin, jota Windows Mobile -ohjetoiminnossa ei ole. Myös haku on erilainen arvioimissani ohjetoiminnossa. Symbianhelp-ohjetoiminnossa haku kattaa vain indeksin käyttämät hakusanat, mutta Windows Mobile -ohjetoiminnossa haku on koko laitteen kattava haku, jossa pystyy määrittelemään haluaako hakea vain ohjeista vai koko laitteesta, ja joka myös muistaa käyttäjän tekemät edelliset haut.

Hyperlinkit

Hyperlinkit auttavat käyttäjää siirtymään tehokkaasti ohjeen aiheesta toiseen. Fillion ja Boyle sisällyttävät hyperlinkit kategorioihinsa, koska heidän mukaansa niiden kanssa on aina ongelmia. (1991: 60, 64.) Symbianhelp-ohjetoiminnossa ei ole hyperlinkkejä, sillä ohjesovellus ei tue niitä. Windows Mobile -ohjetoiminnossa käytetään hyperlinkkejä navigointiin ohjeen aiheiden välillä. Hyperlinkit ovat käytössä myös Katso myös -linkkeinä, jotka johtavat aiheeseen liittyviin ohjeen aiheisiin tai referenssitietoon.

Tekstuaalinen paradigma ja käyttöliittymä/esitysmuoto

Tekstuaalisessa paradigmassa on kyse kirjoitustyylistä ja hypertekstijärjestelmissä käytettävistä

vii

tekstin rakenteista. Molempia tulisi mukauttaa niin, että ohjeen aiheiden lukeminen näytöltä olisi mahdollisimman tehokasta ja tarkkaa. (Fillion ja Boyle, 1991: 60.) Käyttöliittymä/esitysmuoto puolestaan käsittelee tekstin esitystä näytöllä. Fillionin ja Boylen mukaan esimerkiksi hyperlinkkien esitystapaa täytyy harkita tarkasti ja tehtyjä päätöksiä tarkistaa sitä mukaa, kun näytöt kehittyvät (1991: 63). Arvioimissani ohjetoiminnoissa informaatio oli tekstipainotteista, ja niissä oli erilaisia listoja, vinkkejä, huomautuksia ja esimerkkejä. Windows Mobile -ohjetoiminnossa käytettiin värejä ja taulukoita informaation välittämiseen, toisin kuin Symbianhelp-ohjetoiminnossa.

Multimediasisältö

Multimediasisällössä on kyse muun muassa äänen ja videon käytöstä. Fillion ja Boyle ovat sitä mieltä, että multimedian käyttö on "mielenkiintoista", mutta toteavat myös, että multimediaa ei kannattaisi käyttää ennen kuin on selvää, milloin ja miten sitä tulisi käyttää. (1991: 64.) Itse sisällyttäisin tähän kategoriaan myös grafiikat. Kummassakaan arvioimassani ohjetoiminnossa ei käytetty ääntä eikä videota, mutta Windows Mobile -ohjetoiminnossa käytettiin grafiikkaa.

Kustomointi/personointi

Kustomointi/personointi on Fillionin ja Boylen käyttämä termi tilanteesta, jossa käyttäjä pystyy merkitsemään ohjeen aiheet, jotka jatkoa ajatellen kannattaa muistaa (1991: 64). Painetuissa käyttöoppaissahan tämän pystyy tekemään sivua taivuttamalla, mutta ohjetoimintoihin tarvitaan vastaava elektroninen keino. Kummassakaan arvioimassani ohjetoiminnossa ei ollut mahdollisuutta kustomointiin tai personointiin.

Symbianhelp-ohjetoiminnon kehittäminen

Arvioinnin perustella valitsin viisi osa-aluetta, joita Symbianhelp-ohjetoiminnossa voitaisiin

kehittää. Nämä osa-alueet ovat 1) aloitus, orientaatio, lopetus, 2) haku, 3) indeksi, 4) hyperlinkit ja 5) multimediasisältö. Neljä jälkimmäistä ovat suoraan Fillionin ja Boylen heuristiikoista, mutta ensimmäiseen yhdistin aloituksen ja lopetuksen sekä Fillionin ja Boylen orientaation, koska ohjetoiminto täytyy aina pystyä avaamaan ja sulkemaan sen käytön aikana.

Ohjetoiminnon kehittämisessä täytyy ensimmäiseksi pohtia aloitusta, orientaatiota ja lopetusta. Tällä hetkellä Symbianhelp-ohjetoiminto avautuu Valinnat-näppäimen avulla, mutta muitakin vaihtoehtoja voitaisiin harkita. Yksi vaihtoehto voisi olla kysymysmerkki-ikoni, joka olisi käyttäjille tuttu Windows-käyttöjärjestelmästä. Kun ohje on avattu, käyttäjän täytyy pystyä päättelemään missä hän on ja mihin hän on menossa. Tähän tarkoitukseen sopisivat esimerkiksi Sisällysluettelo- tai Koti-ikonit tai Eteenpäin- ja Taaksepäin-painikkeet kuten Windows Mobile -ohjetoiminnossa. Lopuksi käyttäjän on päästävä pois ohjetoiminnosta, ja poistumisen on oltava helppoa ja nopeaa. Tätä varten voitaisiin miettiä erilaisia Sulje-painikkeita tai Windows-tyylisiä [X]-sulkemispainikkeita.

Tutkimus on osoittanut, että käyttäjät etsivät tietoa eri tavoin, mutta enemmistö käyttää mieluiten hakua. Erilaisista mahdollisista hakukonsepteista, kuten avainsanahaku, kokotekstihaku, Boolean-haku ja vapaatekstihaku, kaksi jälkimmäistä saattavat olla liian hankalia älypuhelimen ohje-toiminnolle, mutta kaksi ensimmäistä voitaisiin ottaa mukaan. Haku-toiminnossa pitäisi olla myös historialista, koska tutkimus on osoittanut uudelleenhaun ja hakujen tarkentamisen olevan eniten käytetyimpiä hakumuotoja (Kamvar ja Baluja, 2006: 707; Hackos ja Stevens, 1997: 245-246; Horton, 1994: 70). Fillionin ja Boylen mukaan indeksi täydentää hakutoimintoa, ja se kannattaisi toteuttaa myös uudistettuun Symbianhelp-ohjetoimintoon. Uudistetun Symbianhelp-ohjetoiminnon indeksiin voitaisiin uuden sisällön myötä lisätä myös uusia hakusanoja, kuten animaatioiden kestoaikoja.

Windows Mobile- ja Symbianhelp-ohjetoimintojen suurin ero oli hyperlinkkien käyttö. Kuudesta erilaisesta linkkityypistä neljää voitaisiin harkita uudistetussa Symbianhelp-ohjetoiminnossa: linkit HTML-sivujen välillä, linkit HTML-sivujen sisällä, linkit kirjanmerkkeihin HTML-sivuilla, ja linkit tiedostoihin HTML-sivulla. Kolmea ensimmäistä linkkityyppiä voisi käyttää navigointiin, ja neljättä voitaisiin käyttää erilaisen multimediasisällön lisäämiseen. Lisäksi voitaisiin käyttää ponnahdusikkunoita vaikeiden käsitteiden selittämiseen ilman, että käyttäjä joutuisi siirtymään ohjeen aiheesta toiseen.

Kuten asiantuntija-arvioinnissa kävi ilmi, ohjetoiminnoissa ei käytetty juurikaan värejä, grafiikkaa tai multimediaa. Näiden lisäämisen pitäisi olla varsin yksinkertaista, mutta jokaisen käyttämistä täytyy ensin suunnitella tarkoin. Esimerkiksi jokainen väri vaatii tarkoituksen ja käyttäjien ei koskaan pitäisi joutua pohtimaan, mitä mikäkin väri tarkoittaa (Hackos ja Stevens, 1997: 220). Ohjetoimintoa pitäisi myös pystyä käyttämään ilman värejä. Grafiikkoina voitaisiin käyttää muun muassa käyttöliittymäikoneita. Sekä Hackos ja Stevens (1997: 308-310) että Horton (1990: 177) ehdottavat, että grafiikkaa pitäisi käyttää motivoimaan, houkuttelemaan ja viihdyttämään. On kuitenkin epätodennäköistä, että älypuhelimen ohjetoiminnolla tulisi olemaan niin paljon näyttö- ja muistitilaa, että grafiikkaa voitaisiin käyttää näihin tarkoituksiin.

Arvioiduissa ohjetoiminnoissa ei käytetty multimediaa, mutta sitä voitaisiin käyttää rajoitetusti uudistetussa Symbianhelp-ohjetoiminnossa: esimerkiksi animaatioita voitaisiin käyttää selventämään erityisen vaikeita käsitteitä. Loppujen lopuksi jokainen kuva tai multimediaelementti on lisättävä harkitusti. Vaikka hyperlinkit helpottaisivat navigointia ja grafiikat ja multimedia tekisivät ohjeen aiheista kiinnostavampia, ei tästä ole juurikaan hyötyä jos ohjetoiminto hidastuu niin, että sitä ei kukaan käytä.

Loppupäätelmät

Tämän tutkimuksen tarkoituksena oli arvioida kahden älypuhelimen ohjetoimintoja ja sitten tarkastella, millä tavoin Symbianhelp-ohjetoimintoa voitaisiin kehittää arvioinnissa pohjalta. Valittu arviointimetodi, asiantuntija-arviointi, toimi hyvin tämän tutkimuksen tarpeisiin. Asiantuntija-arvioinnissa ei kuitenkaan kuulla loppukäyttäjän mielipidettä, ja perinteinen käytettävyystesti oikeilla loppukäyttäjillä olisikin tuonut tuloksiini lisää kattavuutta. Tämä voisikin olla yksi jatko-tutkimuksen lähtökohta. Asiantuntija-arviointiin valitsemani Fillionin ja Boylen kategoriat toimivat hyvin tässä tarkoituksessa. Olisi ollut myös mielenkiintoista yhdistää mainitsemani Nielsenin, Purhon ja DeBoardin heuristiikat Fillionin ja Boylen vastaaviin ja luoda niistä älypuhelinten ohjetoimintojen arviointiin tarkoitetut omat heuristiikat.

Asiantuntija-arviointini tulokset paljastivat, että Windows Mobile -ohjetoiminnossa on hyperlinkkejä, joita käytetään muun muassa yhdistämän ohjeen aiheita toisiinsa. Lisäksi Windows Mobile -ohjetoiminnossa käytettiin värejä ja grafiikkaa, mitä Symbianhelp-ohjetoiminnossa ei käytetä. Kummassakaan ohjetoiminnossa ei ollut multimediaa, mikä on helppo ymmärtää kun muistaa laitteiden kuitenkin olevan puhelimia, joissa on rajoittunut muistikapasiteetti.

Esitellyt kehitysmahdollisuudet pätevät niin Symbianhelp-ohjetoimintoon kuin muihinkin ohjetoimintoihin. Tuloksia voidaan siis käyttää hyödyksi myös laajemmin tämän tutkimuksen ulkopuolella. Yksi mahdollinen kehityssuunta olisi Symbianhelp-ohjetoiminnon kehittäminen selaimessa toimivaksi ohjeeksi. Selainpohjaiset ohjeet mahdollistaisivat myös täysin uudenlaisen jatkokehityksen, kuten sosiaalisen median käytön ohjeisiin integroituna. Loppujen lopuksi, älypuhelinten ohjetoiminnoissa on vielä paljon tutkittavaa, ja toivottavasti tämä työ avaa tietä monille uusille tutkimuksille.