ELECTRONIC BOOKS: CONTENT PROVISION AND ADOPTION POSSIBILITIES AMONG USERS IN LATVIA

Aiga GRENINA,
Department of Information and Library Studies, University of Latvia, Riga, Latvia

Abstract

Introduction. This paper provides a brief summary of the most common advantages and disadvantages of electronic books (e-books), based on the diffusion of innovation theory. The first part of this research deals with the analysis of Latvian electronic book collections available on the Internet. The second part examines the usability of e-books. Finally, the author suggests ways for more successful adoption of electronic books.

Method. The research was based on content analysis and examines how three different user groups interact with e-books, using verbal protocol (as the main research method) and a questionnaire (as a secondary research method).

Analysis. The following categories were used to perform content analysis of Latvian e-book collections: general information, availability, contents provision and information retrieval possibilities. The verbal protocol data and notes taken during the observation process are transcribed and compared with answers obtained from questionnaires and content analysis.

Results. Content analysis shows there are at least fourteen collections of Latvian e-books available on the Internet, offering a total of 527 e-books. The results from verbal protocols and questionnaires clearly show different expectations of and requirements from e-books among different user groups. These differences are mainly based on the respondent's age and their different levels of computer skills.

Conclusions. The research shows that the analysed e-books are not suitable for long-term reading. Only successful utilisation of the many e-book advantages could make them more attractive than traditional books.

Keywords: e-book concept, innovation, e-book collection, content analysis, content provision, information retrieval, usability.

Introduction

The print book has not fundamentally changed over centuries, despite transformations in other inventions and the development of new technologies. However, during the past decades, the electronic book (e-book) has been developed as an alternative to the traditional book. Eco is '*pretty sure that new technologies will render obsolete many kinds of books, like encyclopaedias and manuals*' (1996: 299). Eco identifies two types of books, serving two types of reading needs:

- books for systematic or linear reading (fiction, and other literature '*for any circumstance in which one needs to read carefully, not only to receive information but also to speculate and to reflect about it*') (1996: 300);
- books for non-systematic or non-linear reading (reference literature) (1996).

Since the emergence of e-books, the concept of the traditional book has been under review. It is not completely understood how recent technological developments like the Internet, social media, and other developments in data delivery formats etc., might influence the book industry. A user's willingness to accept and use an e-book instead of a traditional book is another unclear and not thoroughly analysed issue.

Topics related to e-books have been examined from different perspectives. The use of e-books in libraries and in the academic environment are the most studied aspects. Rao (2005) considers the use, perspectives and integration of e-books in libraries and information centres. His colleague Pietilä (2005) conducted her Master's thesis on how to use and read e-books. E-books have also been studied by providers of e-books. For

example, *eBrary*, a provider of e-content services and technology conducted worldwide surveys of students (eBrary 2008), academics (eBrary 2007a) and librarians (eBrary 2007b) regarding their usage, needs, and perceptions of e-books. This author agrees with other researchers (e.g., Hoffmann *et al.* 2009) that, whilst many studies examine user opinions of e-books, only a few consider their usability. One such study analysed user experiences when accessing information through electronic and printed books. It concluded that the users' expectations were not met when using e-books for the first time (Hoffmann *et al.* 2009).

This paper deals with the current situation of e-book usage in Latvia, one of the Baltic region countries of Northern Europe with its own national language and a population of 2.25 million (Central Statistical Bureau of Latvia 2010).

The purpose of this study is to determine the current provision of collections of Latvian e-books available on the Internet by analysing the advantages and disadvantages of all Latvian e-books available in these collections and to come to a conclusion regarding the usability of e-books among three different user groups.

Literature review

The adoption of e-books depends on different aspects. Availability, contents, information retrieval possibilities and users' willingness to accept e-books as a relevant source of information are considered the key factors for a successful adoption process. Characteristics of e-books and their current adoption rate within society are the main aspects analysed in this paper. The author has used the diffusion of innovation theory for the research.

Diffusion of innovation theory

According to the diffusion of innovation theory the following questions must be taken into account when the adoption possibilities of an innovation are studied:

- What is the innovation?
- How does it work?
- Why does it work?
- What are its consequences?
- What are its current advantages and disadvantages? (Rogers 2003)

The theory has been widely used for researching the adoption of information and communication technologies and electronic publishing (Hanh and Schoch 1997; Lajoie-Paquette 2005). According to the theory, it is often difficult to get an idea, practice or object adopted, even when it has obvious advantages (Rogers 2003). Usually it takes a long time before an innovation is widely adopted. Critics of the theory recognise it as a good descriptive tool, but consider it less strong in explanatory issues, and less useful in predicting outcomes, and providing guidance as to how to accelerate the rate of adoption (Clarke 1999). However the broad framework of the theory provides a platform for investigations of innovations in the library and information science. Despite its shortcomings, the theory is sufficiently robust in explaining the adoption and/or diffusion of information and communication technology innovations (Minishi-Majanja and Kiplang 2005).

The concept of e-book

Studies of e-books show that there is no generally accepted definition (Armstrong 2008; Vassiliou and Rowley 2008). One of the simplest and most comprehensive explanations defines e-books as '*an online version of printed books, accessed via the Internet*' (Gold Leaf 2003: 17). Other definitions allow classification of a wide range of documents under the e-book label: '*any piece of electronic text regardless of size or composition (a digital object), but excluding journal publications, made available electronically (or optically) for any device (handheld or desk-bound) that includes a screen*' (Armstrong *et al.* 2002: 217). A recent study (Vassiliou and Rowley 2008) suggests considering the use of a two-part e-book definition that captures the persistent characteristics of e-books in one part, and changing characteristics in the other:

1. An e-book is a digital object with textual and/or other content, which arises as a result of integrating the familiar concept of a book with features that can be provided in an electronic environment.

2. E-books, typically have in-use features such search and cross reference functions, hypertext links, bookmarks, annotations, highlights, multimedia objects and interactive tools" (Vassiliou and Rowley 2008: 363).

Literature studies reveal that the diversity of e-books, their different access options and constant changes in technological development, are the main obstacles for universally accepted definitions of the term *e-book*. There are however some similarities in the definition of e-books. Definitions used by scholars, librarians, and e-book providers usually refer to an e-book as an interactive or digital document, and/or reading device. Diverse contents and different file formats of e-books as well as their analogy with traditional books are other often mentioned characteristics of e-books.

It is obvious that e-books try to address the limitations of traditional print books. Contemporary e-books, unlike printed books, are dynamic, include personalisation options, and are available immediately in different formats and devices.

Typology of e-books

The publishing industry currently offers a wide range of e-books. Previous studies of the typology of e-books by Hawkins (2000), Schneider (2006-2010) and Vassiliou and Rowley (2008) included e-books that require a dedicated e-book reader. E-books in plain text format, and e-books designed for reading on standard computers were mentioned in two of three classifications. Only Vassiliou and Rowley distinguished between free and chargeable e-books (2008). Authors of the aforementioned studies differ when it comes to whether print-on-demand books and multimedia books should be classified as e-books. Access possibilities to contents of e-books, their formats, price, and downloading options were the main factors that were taken into consideration when classifying different types of e-books. All three typologies were used for sampling in this case.

Advantages and disadvantages of e-books

The choice between a traditional book and an e-book is influenced by many things. The most important factors are the differences between the two book formats, and users' attitudes towards both those formats. This paper goes on to discuss the advantages and disadvantages of the e-book compared with the traditional book. Opinions expressed by academics, researchers, writers from the library and information science discipline and e-book publishing industry are summarised.

The identified advantages of e-books are:

* *Availability.* E-books can be accessed by different types of devices: computers, e-book readers, mobile phones, etc. They can be accessed anywhere the Internet is available. Open access e-books can be used simultaneously by unlimited numbers of users. Providers of e-books therefore do not have to worry about the number of copies of e-book titles (Berglund *et al.* 2004; eBrary 2007a; eBrary 2008; Hawkins 2000; Rao 2003; Vassiliou and Rowley 2008).
* *Economic advantages.* E-books offer savings on costs of paper, ink, binding, packing, and delivery (Armstrong and Lonsdale 2003; Hawkins 2000; Rao 2003; Vassiliou and Rowley 2008).
* *Environmental advantages.* Increasing use of e-books can reduce the consumption of paper and save trees (Hawkins 2000; Rao 2003).
* *Flexibility.* It is possible to change the visual appearance of e-books, their font size or style, etc. Such personalisation options enable the same text to be available to different audiences in their preferred format. Print books, in contrast, would require different print runs in, for example, standard and large print (Armstrong and Lonsdale 2003; Rao 2003; Vassiliou and Rowley 2008).
* *Multimedia.* E-books can be enhanced with multimedia features: interactive images, sound, and/or video material. Interactive features such as commentary options and chatting are also available (Armstrong and Lonsdale 2003; Rao 2003; Vassiliou and Rowley 2008).
* *Space saving.* E-books do not require physical space. Unlike print books, there is no limit, in terms of storage space, on the number of e-books held in a collection (Armstrong and Lonsdale 2003; Rao 2003; Vassiliou and Rowley 2008).

- *Portability*. E-books can be forwarded from one computer to another or even to another device (Berglund *et al.* 2004; Rao 2003; Vassiliou and Rowley 2008).
- *Search possibilities.* While traditional books offer only a table of contents and different kinds of supplementary indexes, most e-books offer a variety of computerised search options such as unlimited keywords, combination of search results, search history, search within a book or the whole collection (Armstrong and Lonsdale 2003; eBrary 2007a; eBrary 2008; Hawkins 2000; Rao 2003; Vassiliou and Rowley 2008).
- *Security.* It is harder to lose, steal or damage e-books, especially if they are available on the Internet, than print books (Armstrong and Lonsdale 2003; Berglund *et al.* 2004).
- *System of navigation.* Hyperlinked references in footnotes, titles, places, or people mentioned in the text facilitate access to related sources of information in e-books and save time (Armstrong and Lonsdale 2003; Hawkins 2000; Rao 2003; Vassiliou and Rowley 2008).
- *Text processing.* Many e-books provide features like bookmarks, text highlighting and underlining. Cutting, copying and pasting, printing and saving of text for later use are also possible (Armstrong and Lonsdale 2003; eBrary 2007a; eBrary 2008; Hawkins 2000; Rao 2003; Vassiliou and Rowley 2008).
- *Timeliness.* The publishing process for e-books is much shorter than for traditional books. (Armstrong and Lonsdale 2003; eBrary 2008; Hawkins 2000; Vassiliou and Rowley 2008). The electronic environment also enables immediate updates and corrections of information already published (Armstrong and Lonsdale 2003; Hawkins 2000).

Such advantages make e-books a potentially powerful competitor to traditional books. Most of the advantages, but especially the search possibilities, system of navigation, text processing and information updating, could be more useful to the books which Eco (1996) defined as books for non-linear reading purpose or reference literature. Thompson (2005) has a similar point of view. When describing the potential of e-books, he particularly stresses the advantages of electronic reference literature available online (2005). Thompson states that reference publications are not usually read from cover to cover. Readers just search for answers to their questions.

Despite the advantages of the electronic environment, there is still high demand for printed books and the specific disadvantages are:

- *Availability*. E-book titles are limited and there is an unequal distribution of titles across subjects. Limited access to e-book readers at local stores is also an issue (Armstrong and Lonsdale 2003; Berglund *et al.* 2004; eBrary 2007a; Hawkins 2000; Rao 2003; Vassiliou and Rowley 2008).
- *Computer skills*. Insufficient computer skills, lack of experience of e-book use and technophobia create barriers to e-book use (Armstrong and Lonsdale 2003).
- *Equipment*. E-book reading devices are comparatively expensive, and readers are unused to reading long texts on a small screen (Armstrong and Lonsdale 2003; eBrary 2007a; Elgan 2007; Hawkins 2000; Thompson 2005).
- *Format*. There are many incompatible e-book formats. Therefore, users are forced to get specialised software or a particular hardware (Berglund *et al.* 2004; Herther 2005; Rao 2003; Thompson 2005; Vassiliou and Rowley 2008).
- *Lack of information*. Users do not know about the existence of e-books or their collections on the Internet or at the nearest libraries (Bennett and Landoni 2005).
- *Language*. The majority of the released e-books are available in English, only a small proportion is in German and other languages (Thompson 2005; Vassiliou and Rowley 2008).
- *Piracy*. The balance between the interests of publishers and users regarding protection of e-book content is

still an internationally unresolved issue (Herther 2005).

- *Price.* Prices of e-books are almost the same as those of traditional books, despite the savings on costs of paper, ink, binding, packing, and delivery (eBrary 2007a; Elgan 2007; Herther 2005; Rao 2003; Thompson 2005).
- *Rights.* A lot of e-books have limitations regarding their printing, sharing and saving options due to copyright issues and publishing models (Herther 2005; Rao 2003; Thompson 2005).
- *Unpredictability.* A new kind of e-book reading device or format can be released at any time. New inventions can make current technological solutions obsolete. Provision of e-books can change at any time. Providers of e-books have rights to forbid access to some titles or even to remove the whole collection (eBrary 2007a; Rao 2003).

These disadvantages are the main reason why a new e-book era has not begun in the publishing industry. At the same time, there is no convincing evidence that the revolution is not possible or has not already started. Quarterly statistics on the e-book trade in the USA show a constant increase in revenues of e-book sales since the third quarter of 2003 (International Digital Publishing Forum 2010).

Although it is hard to forecast the future of e-books, Brindley has predicted that by the year 2020, 40% of UK research monographs will be available in electronic format only, while a further 50% will be produced in both print and digital. A mere 10% of new titles will be available in print alone by 2020. (Sanderson 2005).

However e-book adoption differs between countries. This paper will now focus on Latvian e-books, their current availability and users' attitude towards them.

Methods of data collection

The aim of this research is to study the provision and usability of e-book collections that are available in Latvian language and consists of two empirical studies: the first analyses the content of existing e-book collections; the second, carried out as a usability study, clarifies the attitudes of the users towards e-books.

The research is based on content analysis, which, roughly defined, is a type of document study where the analysed content could be anything: words, phrases, pictures, ideas, etc. (Beck and Manuel 2008). Content analysis has been widely used by such disciplines as psychology, sociology, and politics (Krippendorff 2004). Recent research trends show that this method has been regularly applied to library and information science research. As Koufogiannakis *et al.* (2004) found out, content analysis is one of the five most preferred methods for research carried out in library science.

A sample collection of e-books was identified by using the search engine Google, its hosted service Google Books and browsing Web pages of eight Latvian libraries of national significance. Because of the huge amount of information, the author analysed only those collections of e-books that consisted of four or more e-books. In order to be included in the study, a collection had to be available on the Internet and host e-books written in Latvian. This research also covers e-book collections that consist of e-books with separate chapters in Latvian or with text both in Latvian and foreign languages. Digital documents that lacked the generally accepted structure of a book: text, organizational, narrative, thematic and cultural structures (Sun 2007) were excluded from the research. Data for the research were collected between February 27th and March 10th 2009.

Collections of Latvian e-books were evaluated by applying categories and indicators listed in Table 1 (see Appendix 1 for more detailed categories and indicators list). All categories and indicators were based on the literature review of the concept of e-books, typology, and advantages and disadvantages of e-books.

E-books available in two or more collections were included in the analysis only once. All defined criteria were applied only to the e-books accessible free of charge. Chargeable e-books were analysed based on those categories where the information for analysis was freely available.

The main aim of the usability research was to clarify the attitude of different user groups towards e-books as an innovation into the market. Verbal protocol as The main

research method was the verbal protocol and a questionnaire was used as a secondary research method.

The data gathered from verbal protocols provided the main information on users' skills and acquirements regarding the adoption of e-books. The researcher's observations during the data gathering process from verbal protocols and the questionnaires completed by the participants increased the accuracy of measurements of human behaviour. Data were gathered between 13th and 16th March, 2009.

Research shows that valid data in usability research through the use of the verbal protocol can be obtained from a relatively small number of users. Nielsen suggests including three users in each group when three or more different groups of users are studied. Such a number is enough to cover the diversity of behaviour within the group (Nielsen 2000). On this basis, the author of the paper analysed three different user groups: an expert group with experience of e-book usage; and two different age groups without experience of e-book usage. Participants of these groups were 19-25 or 46-55 years old. Age of the expert group participants was not taken into account during the participant selection process. The main factor for the selection of the expert group participants was their previous experience. Each group consisted of three people.

The three groups follow the diffusion of innovation theory. According to it, the distribution of innovation includes these elements: the innovation itself, the channel of communication and the individuals with and without previous knowledge or use experience of a particular innovation (Rogers 2003).

Observation and usability research are focused on human behaviour and actions. There are many different methodologies for examining an issue (Beck and Manuel 2008). The author of the research used a verbal protocol or think aloud protocol (also known as protocol analysis or thinking aloud technique) as the main research method for users' skills analysis, acquirements, cognitive processes, preferences and decision making processes during e-

book use. '*Verbal protocols are rich data sources containing individuals' spoken thoughts that are associated with working on a task*' (Bourg 2010). Verbal reports usually consist of short, unfinished sentences which describe actual actions and thoughts occurring during the task.

Before starting the verbal protocol session, each participant was informed about the method and the existence of two task sheets which contained identical information. The sheets with six tasks in printed and electronic format were available to the participants during the whole process. The maximum time limit for all six tasks was 45 minutes. Each participant fulfilled the tasks separately and all spoken thoughts and navigation actions on the computer screen were recorded by means of screen capture programs: *ORipa Screen Recorder-recorder (Windows XP)* or *Debut Video Capture Software (Windows Vista)*. All e-books used in the verbal protocol sessions had open access and were designed for reading on standard computers. Only e-books were available to the participants for completing the first four tasks. To complete the fifth and the sixth tasks, the participants could use printed and/or electronic versions with the same contents. The first and the second tasks were related to navigation activities, while the remaining four were information retrieval tasks from reference, scientific and fiction publications (see Appendix 2).

The researcher used unstructured observation of participants during the data collection process. This type of observation means that there are no predetermined categories of behaviour (Powell and Connaway 2004). The researcher followed the participants unobtrusively by taking notes of their actions during the observation process.

A questionnaire was used as the secondary research method. This method has been defined as '*a set of carefully designed questions given in exactly the same form to a group of people in order to collect data about some topic(s) in which the researcher is interested*' (Jupp 2006: 252). Every participant completed two different questionnaires: one before and one after the data collection process from verbal protocols. Before obtaining data from ver-

bal protocols, each participant was asked to complete a questionnaire with general personal information: gender, age, education, self-assessment of computer skills and existence of previous experience of e-book use (see Appendix 3). After the verbal protocol session each participant completed another questionnaire (see Appendix 4), the main purpose of which was to examine users' attitude towards e-books after their actual use. Both questionnaires consisted of fixed-response questions. The second questionnaire used Likert scale questions which were based on four of Rogers's characteristics:

- Relative advantage, or '*the degree to which an innovation is perceived as being better than the idea it supersedes*' (2003: 229<#rog2003>);
- Compatibility, or '*the degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopters*' (2003: 240 <#rog2003>);
- Complexity, or '*the degree to which an innovation is perceived as relatively difficult to understand and use*' (2003: 257 <#rog2003>); and
- Trialability, or '*the degree to which an innovation may be experimented with on a limited basis*' (2003: 258 <#rog2003>).

The fifth characteristic, Observability, or 'the degree to which the results of an innovation are visible to others' (2003: 258), was not used in the questionnaire, since the aim was to conduct an experiment on actual use, rather than to determine whether and how the participants had seen e-books in use previously. Instead the participants were asked about the possibility of their future use of e-books and the results are reported below under the heading, *Potential for future use*.

Diffusion of innovation theory states that these characteristics of innovations are appropriate for explaining the rate of adoption of innovations.

Results of the content analysis of the Latvian e-books collections

According to the research results there are at least fourteen collections of Latvian e-books on the Internet totalling 527 volumes. Their availablilty in Latvian is a relatively new phenomenon: moreover, the results indicate that providers of Latvian e-books are not using the full range of features that are considered to be the advantages of electronically available books. This investigation suggests that most books are transformed into electronic format because of expiration of their copyright term; or because the topic is of interest to only some enthusiasts of a specific subject area; or because their authors are representatives of academic institutions; and not because of taking advantage of the electronic environment. They are offered not by publishers, but by enthusiasts of a specific subject area or representatives of academic institutions. Frequently, they do not publish these e-books themselves, but simply collect those available on the Internet or create free e-book collections within frameworks of a specific project by attaining business partners and financial resources.

General information

Publication date and number of pages were not available for the majority of the e-books; respectively 59.4% and 65.1% of the books lacked such information. Those that did provide such informaiton were usually published between 2005 and 2009 (20.1%). The most common size of an e-book is 50-150 pages (14%).

The similarity of e-books with traditional books is one of the most often mentioned characteristics in the literature (Feather and Sturges 2003; Reitz 2004; Connaway 2007). The results of content analysis reveal that only 34.5% of all Latvian e-books visually resemble traditional books and 46.9% their layout structure. Collections of Latvian e-books are suitable for reading on standard computers. In most cases there is no need for additional software: contents of books are available immediately on an Internet browser or on standard software like Microsoft Office and Adobe Reader. Only one third of e-books required additional software. Simple technological solutions were used to make Latvian e-book collections. The author did not find any multimedia books or e-books specially designed for reading on e-book readers.

Despite the fact that 38% of the e-books were chargeable, the market has not yet de-

veloped. The few providers who offer chargeable e-books do not offer a wide choice of topics. Current provision consists mainly of digitized copies of print books, which complies with Armstrong's observation that '*relatively few e-books have been written as born-digital books, while many thousands of existing print works have been digitized, and a smaller number are published in parallel with the printed book*' (Armstrong 2008: 200).

Latvian e-books are mostly accessible using HTML or PDF formats; 73.1% of the books contained contents available in print books, and 26.9% offered unique contents. The price of e-books with the same content was usually lower than the price of the traditional books. There was only one exception when the e-book was more expensive.

Content provision

As stated before, reference literature is most suitable for the electronic environment, but they form only a small part (6.6%) of Latvian e-books 6.6%. The remaining 93.4% consist of books to be read linearly. This suggests that reading purpose is not determinative when it comes to decision making about title selection for the electronic environment.

Division of publication types used in this research is borrowed from regulations on production of printed output and imprint approved in Latvia (Latvian Association of Publishers *et al.* 2006). The most frequent publication type is fiction publications (50.5%), followed by collections of articles (18.4%) and scientific publications (7.8%). Taking into account the popularity of fiction publications, the author researched separately different fiction genres. The most common fiction genre available as an e-book is prose (19.2%), followed by poetry (18.6%) and drama (11.8%). Lyric-epic with 0.9% was the least represented genre available as an e-book.

Subject classification for the research purpose was adopted from the subject list available at EBSCO's A-to-Z tool (EBSCO Industries 2002-2010). The results of the covered subjects showed that there is no homogeneity. Latvian e-book collections cover mainly language and literature (51.2%), history (14.2%), and political science (8.5%). There are no e-books in computer science, engineering and technology, or fine arts and music.

Information retrieval possibilities

Search possibilities were incorporated in 61.3% of books. The most common type of search was a simple search (61.3%). Only 23.7% of books were equipped with advanced search options. Browsing was only possible for one e-book (0.2%). None of 527 e-books was supplemented with multimedia features: interactive images, sound or video material. Only five (0.9%) of books used hyperlinked cross-references. The most frequently used personalisation feature was an option to change text size (30.2%). The other personalisation options were zooming (29.0%), font style change (1.9%), and adjustable interface (0.0%). Two communication options were analysed: commentary options and chatting; chatting was not available at all, but commentary options were incorporated in nine e-books (1.7%). Printout option (58.4%), copying (58.1%) and save or save as options (28.3%) were the most common text processing features. Other text processing features such as bookmarks, cutting, noting, and text labelling were rarely available.

These data on Latvian e-book collections deal with the current availability of e-books and the usage of e-book advantages, which are essential factors in the formation of user's attitudes.

Results of the usability study

The results of verbal protocols and questionnaires showed that the three user groups had diverse expectations and requirements of e-books, which were related to the participants' age and their level of computer skills. In the pre-research questionnaire all the participants of the 19-25 age group and expert group assessed their computer skills as sufficient, while participants of the 46-55 age group as quite sufficient, quite insufficient, or insufficient. In spite of the different evaluation of their computer skills in the age group 46-55, the informational behaviour and results of the participants were similar. No participants in the 46-55 age group completed all six tasks and none of the participants could complete the sixth task which was an information retrieval task using a fiction e-book or printed book that had the same content. One participant could not complete the fourth task,

which was also an information retrieval task with the right answer located in a reference e-book. Participants of the 46-55 age group spent the whole given time – 135 minutes (45 minutes per each participant). The participants of the expert group and of the 19-25 age group completed all the tasks and the total time spent on tasks by both the groups was similar: 76 minutes for the expert group and 78 minutes for the 19-25 age group.

Next the author examines the results of the usability research, taking into account four of the five characteristics of innovation: i.e., relative advantage, compatibility, complexity and trialability (Rogers 2003). In the process of analysis, results from the post-research questionnaire are used, as well as the author's observations during the completion of the tasks and comments from participant's verbal protocols.

Relative advantage

In the post-research questionnaire to examine the possible advantages of an e-book over a traditional book, questions about navigation and content browsing were asked, as well as finding answers to specific questions and long-term reading. The participants indicated that they would prefer traditional books for long-term reading, while e-books would be used for navigating or browsing and finding answers to certain questions.

Navigation and browsing. Almost all participants acknowledged that the e-book is more efficient if one wants to browse content. Neither the experts nor the 19-25 group had problems browsing the content of an e-book, then returning back to the electronic task sheet. Nor did they navigate to parts of the Websites that were unconnected with the task. The 46-55 group did however experience problems.

How did I end up in this Website? Am I on the Website? To enter, where to exit? How can I return back? (age group 46-55)

Ah, I am going into wrong part, there I have to write if I find any mistakes. (age group 46-55)

The verbal protocol shows that the participants want more hyperlinks within the contents. This would save time and avoid the need to scroll through all the book contents.

It doesn't open here, I simply have to scroll. What a torture! (experts) The main obstacle is this scrolling! (experts)

Finding answers to specific questions. All participants saw the search options in e-books as a great advantage. Some stated that looking for answers in a traditional book would be more complicated or even impossible.

It would be more complicated to find the answers in a traditional book, since you don't know in which chapter is the answer. Here you only enter the phrase and the finder automatically shows the place, where the answer is. This is an advantage of an e-book. (age group 19-25)

It is better [to find information] in electronic format, but I must admit, that it is not very easy as well, anyway – it is easier to find the answer here than in a traditional book, but not too easy! (experts)

Participants of the expert and 19-25 groups admitted that e-books would be more suitable for finding the answers if more search options were offered. Participants added that it would be even better if the users could choose to find information in a specific paragraph, chapter, e-book or collection, and the user would always know in which of the parts the search engine is working.

If they would write from the beginning 'find in this work', I would understand that the searching is held in this specific work, but if there is only a word 'find', it is hard to understand whether the searching process happens only in the specific work or in whole Letonika [collection of e-books]. (experts)

Participants in the 46-55 group could not always successfully use the search options. They had problems locating the *Find* button and opening the results they had already found.

So, how to search here? I had to press somewhere click, click. I could have done this long time ago. Where? Oh, here! What a nightmare! Stupid me, cannot find the binoculars. (age group 46-55)

I click, but how to open, I'm sorry – but I cannot open! How come? (age group 46-55)

So, where should I search? I think I'm looking in a wrong chapter, why did I open the second chapter? I don't understand anything! (age group 46-55)

Long-term reading. *The possible answers to the question Are the e-books more suitable for long-term reading, if we compare them with traditional books?* were *Not really* (4), *no* (4) and *I don't know* (1). During the verbal protocol data collection process, some participants tried to avoid reading from the screen by combining the use of traditional books with e-books with identical contents, where both formats were available. In these cases traditional books were used for browsing or reading activities while e-books were used for searching activities. Participants also indicate that in long-term reading a traditional book is more suitable than an e-book.

My eyes start to hurt. You look for a specific place, become tense and eyes start to hurt. (experts)

Well, this is a good thing after all inside your PC, the only question – how to read it in a long-term? (experts)

Better to read a book (traditional) [..]. You can print the e-book and read it; it's possible. (age group 19-25)

Compatibility The questionnaire asked about the compatibility of e-books with information needs. In the expert group the answers were divided between *yes* and *no*. All participants of the 46-55 age group answered *do not know*. All respondents of 19-25 age group answered *usually*. Nevertheless, one respondent from this group said the following:

If I had a traditional book, I would use it, but if I don't have a book I will use this [e-book].

Complexity The diffusion of innovation theory suggests that those innovations that are easy to use are more likely to be adapted into society. Whilst performing the practical tasks, the opinions of the participants about the simplicity of using the e-book were divided.

It is so easy and I was prepared for something more complex. (experts)

So... now I'll try to find something.... Here it is – easy! (experts)

It was so hard, oh! (age group 19-25)

So, finally! ...That was hard! (age group 46-55)

I guess it was easy, since even I could find it! (age group 46-55)

However, when answering the question '*is the e-book easy to use?*', the most popular answer in all groups was *usually*. Only one respondent from the experts had a different opinion. He answered with *yes*. But one respondent from the age group 46-55 chose the answer *not usually*.

Trialability. One factor that affects an innovation's adoption is the skills and knowledge needed to try the innovation. So respondents were asked if they possessed the skills and knowledge needed to successfully use e-books. Almost all respondents in the experts and 19-25 age groups answered *yes*. However all participants in the 46-55 age group – said *no*. Information from verbal protocols shows that participants of this group fail to complete the tasks because of insufficient computer skills and no previous experience with e-books.

I don't know. I'll search until the morning. I don't know. Hopeless. No, I can only find some information on the Internet. (46-55)

I will press something, nightmare will begin! (46-55)

If I knew how to find it more easily, I would find, but... (46-55)

I will not open it anyways; I don't know how to open it. (46-55)

So, I can't find. I forgot how to search. Before I found something twice, but now I totally forgot everything. I will not find. (46-55)

Well, I haven't been in such e-book before. I don't know anything. (46-55).

Potential for future use. To ascertain whether participants recognised the potential of e-books the following question was asked after completion of the practical tasks: *Has your experience of e-books convinced you to use them for searching for information in the future?* There were various responses from the expert group; one said *yes*; one. *perhaps*; and the third. *I don't know*. In the 19-25 age group one said *yes*, the other two: *perhaps*. Despite the relief expressed by participants of the 46-55 age group that the practical tasks were over, all respondents answered *yes* or *perhaps*. The results and comments expressed by the 46-55 age group indicate the need for special practical training courses on using e-books. During the practical tasks, participants of the 46-55 age group expressed a need for further training, the other two groups did not express such necessity, and they were able to complete all tasks.

I need an explanation for five or three times, then I will remember, but like this... every time I do the same... I think so. Just like a monkey – you place it somewhere and he takes a banana three times out of three, the same as here. Three times you do the same and the fourth time you remember. (46-55)

One can find everything easily. (19-25)

The usability research revealed that users both with and without previous experience of e-books, were more successful in the tasks where a link was provided to a concrete e-book title, rather than to the whole collection. All the participants were quicker and more successful in the first two navigation tasks than in the following information retrieval tasks. Provision of task sheets in electronic and printed formats showed the advantages of both formats. All participants, with one exception (from the 19-25 age group), used the electronic form for accessing the given e-books or their collections. However participants mainly used the printed task sheets for reading or remembering tasks. One of the experts mentioned that the printed sheet enabled better perception of the given tasks. These observations suggest a parallel analogy with the advantages and disadvantages of traditional books and e-books.

Conclusion: towards e-book adaption

Results from the content analysis and verbal protocols show that Latvian e-book publishing industry is only at its beginning. Although many Latvian e-books offer only some of the advantages offered by the electronic environment, the usability study shows that e-books can already compete with traditional books or even surpass them in certain situations. However, for large scale adoption, e-books need to offer more options and use their advantages more effectively. Only effective use of the e-book advantages could make them more attractive than traditional books. It is especially important to attract those users who have no experience of e-books and/or lack the necessary computer skills. The research shows that the main advantage of traditional books over e-books is their suitability for long-term reading. As such linear reading is frequent, there is a clear need to adapt reading from a screen to make it as comfortable as reading from printed pages.

Adoption and use of e-books are most evident among users with good computer skills and/or previous experience of e-book usage. The usability research showed a significant difference between the members of the 19-25 and 46-55 age groups who lacked experience of e-book use. Obstacles were not observed for the adoption of e-books among users of the 19-25 age group, even if they had not used e-books before. At the same time poor searching and Internet skills could be considered an obstacle for successful adoption of e-books among users from the 46-55 age group. The comments and answers received from the participants of the 46-55 age group revealed their willingness to learn and improve their information retrieval skills.

Organised training courses on e-books, greater publicity and better use of e-book advantages could lead to successful adoption of e-books. Interfaces designed for different age groups, could also accelerate adoption. The results showed that the same interface could not meet the diverse needs of users from different age groups and with different knowledge levels. Middle-aged or senior users with no previous experience of e-books might prefer simple interfaces with basic options, designed in their native language. Other features could be highlighted search and navigation buttons; a clearly visible search bar; enlarged font size, and logical use of hyperlinks within the book or the whole collection. Data from the verbal protocols, observation and second questionnaire highlighted the importance of properly organized and well-arranged search results. If the search results satisfy users' information needs, they will continue to use e-books; and as the participants said, they could even inform others about e-books and their usability for information retrieval. Overall, the results of the research show that e-books can be made more usable and that this would lead to greater adoption levels among users.

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About the author

Aiga Grenina is a third year Ph.D. student in the Department of Information and Library Studies, University of Latvia. She received her Bachelor's and Master's degree in Librarianship and Information Science from the University of Latvia. She can be contacted at: Aiga.Grenina@lu.lv

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Appendices
Appendix 1

Categories and indicators list used for the analysis of collections of Latvian e-books

Categories	Indicators
General information	publication date (2009-2005; 2004-2000; 1999-1990; 1989-1940; 1939-1918; older; not presented)
	number of pages (5-49; 50-150; 151-300; 301-450; 451-600; 601-900; indefinable)
	analogy with the traditional book: (visual resemblance; layout structure)
	typology (e-books in plain text format; e-books that require a dedicated e-book reader; e-books designed for reading on standard computers; downloadable e-books; multimedia books)
Availability	price*(higher; lower; indefinable)
	format (HTML; PDF; RTF; other)
	degree of accessibility of content free of charge (all content; some part of content)
	existence of identical content in traditional format (yes; no)
General information	publication date (2009-2005; 2004-2000; 1999-1990; 1989-1940; 1939-1918; older; not presented)
	number of pages (5-49; 50-150; 151-300; 301-450; 451-600; 601-900; indefinable)

Categories	Indicators
General information	analogy with the traditional book: (visual resemblance; layout structure)
	typology (e-books in plain text format; e-books that require a dedicated e-book reader; e-books designed for reading on standard computers; downloadable e-books; multimedia books)
Availability	price*(higher; lower; indefinable)
	format (HTML; PDF; RTF; other)
	degree of accessibility of content free of charge (all content; some part of content)
	existence of identical content in traditional format (yes; no)
Content provision	reading purpose (linear; non-linear)
	publication type (review publication; bibliographical publication; fiction publication (drama, poetry, lyric-epic, prose); yearbook; teaching aid; normative publication; religious publication; article collection; manual; reference publication; scientific publication)
	subject (business and economics; communications and journalism; computer science; education; engineering and technology; fine arts and music; general reference; geography and anthropology; history; language and literature; law; medicine and health sciences; military and naval science; philosophy and religion; political science; psychology; recreation, leisure and sports; science; social sciences)
Information retrieval possibilities	searching scope (within one particular e-book; within e-book collection)
	search type (simple search; advanced search; browsing)
	multimedia (interactive images; sound; video)
	navigation (hyperlinks; cross-reference system)
	personalization (text size change; font style change; zooming; adjustable interface)
	communication possibilities (commentary options; chatting)
	text processing features (bookmarking; printout option; cutting; copying; noting; saving; text labelling)

* In comparison with a traditional book with a similar content.

Appendix 2

Task sheet

Please, try to express aloud all the thoughts that describe your actions during completion of the tasks. The maximum time limit for all six tasks is 45 minutes. You can complete the tasks by using different approaches. Answers to questions 1-4 are available in the stated electronic books, but in order to find the answers to the questions 5 and 6 it is possible to use traditional books as well (you can complete the tasks in any order you like).

Good luck!

1. *Baigais gads* [The Ghastly Year]. Available: http://home.parks.lv/leonards/ BaigaisGads/Default.htm *Task:* Open e-book's chapter *Posters, posters, posters…* and browse through the content from page 37 until page 44.

2. *Indriīa hronika* [The Chronicle of Henry of Livonia]. Available: http://www.historia.lv/alfabets/I/In/Indrika%20 hronika/teksts/saturs_indr_hr.htm *Task:* With a help of e-book's table of contents, move from one chapter to another, try the cross-reference system within the e-book.

3. *Latvijas ļaudis uz 21.gadsimta sliekšņa: virtuālā enciklopēdija* [Latvia's people at the turn of the 21st century: virtual encyclopedia]. Available: http://www.gramata21.lv *Task:* How many diffe-

rent persons with name Janis Abolins are mentioned in the encyclopaedia?

4. Đuvcāne, V., Ernštreite, I. *Latviešu-lîbiešu-angļu sarunvārdnīca* [Latvi-an-Livonian-English Phrase Book]. Available: www.eraksti.lv/fetchbook.php?urlkey=1312742 *Task:* How to say *Thank you, I am fine* in English and Livonian?

5. Latvijas Universitāte [University of Latvia]. *Latvijas Universitātes raksti.* 2006. 699. scj. *Bibliotēkzinātne:* bibliotēka un sabiedrība [Scientific papers University of Latvia. 2006. Volume 699, Library science: Library and Society]. Available: http://www.lu.lv/apgads/izdevumi/lu-raksti/ *Task:* What key words are used in order to describe the theme from the collection *Latvian Book Calendars in the Latvian History of Culture*?

6. Kaudzītes, R., Kaudzītes, M. Mērnieku laiki [Times of the Land-Surveyors: novel]. Available: http://www.letonika.lv/literatura or http://www.ailab.lv/Teksti *Task:* What gifts Kencis is bringing to mister surveyor by adding them into his prayer, in which he asks the God to give such mind to the mister surveyor, so he would give to Kencis the meadow of deep walley, fields of the Pea Mountain and growths between Slamsti and Smakani?

Appendix 3

Pre-research questionnaire for the usability research

Gender:
[ ] female   [ ] male

Age:
[ ] below 19 years old   [ ] 19 – 25 years old
[ ] 26 – 35 years old   [ ] 36 – 45 years old
[ ] 46 – 55 years old   [ ] 56 – 65 years old
[ ] 66 years old and above

Education:
[ ] basic education   [ ] secondary education
[ ] education at the secondary specialised school
[ ] higher education   [ ] other _____

How would you evaluate the level of your computer skills?
[ ] sufficient   [ ] quite sufficient
[ ] quite insufficient   [ ] insufficient
[ ] do not know

Do you have any previous experience in usage of an e-book?
[ ] yes   [ ] no

Appendix 4

Post-research questionnaire for the usability research

1. Are e-books more suitable for...
- navigation and content browsing, if we compare them with traditional books?
[ ] yes   [ ] usually   [ ] not really   [ ] no
[ ] do not know

- finding answers on specific questions, if we compare them with traditional books?

[ ] yes   [ ] usually   [ ] not really   [ ] no
[ ] do not know

- long-term reading, if we compare them with traditional books?

[ ] yes   [ ] usually   [ ] not really   [ ] no
[ ] do not know

2. Are e-books as an innovation suitable for your informational needs?

[ ] yes   [ ] usually   [ ] not really   [ ] no
[ ] do not know

3. Are e-books easy to use?

[ ] yes   [ ] usually   [ ] not really   [ ] no
[ ] do not know

4. Are your current skills and knowledge suuficient enough to use e-books?

[ ] yes   [ ] usually   [ ] not really   [ ] no
[ ] do not know

5. Did the results of performed searching convince you to use an e-book for searching for the information in the future?

[ ] yes   [ ] usually   [ ] not really   [ ] no
[ ] do not know

Sursa: http://informationr.net/ir/17-1/paper512.html