How would you like your e-newspaper?
– converging the best from two worlds

Maria Åkesson

Halmstad University
P.O Box 823
S-301 81 Halmstad, Sweden
maria.akesson@ide.hh.se

Carina Ihlström

Halmstad University
P.O Box 823
S-301 81 Halmstad, Sweden
carina.ihlstrom@ide.hh.se

Jesper Svensson

Halmstad University
P.O Box 823
S-301 81 Halmstad, Sweden
jesper.svensson@ide.hh.se

Abstract

The introduction of the e-newspaper, i.e. a newspaper based on e-paper technology brings new design challenges. In this paper we report from two parallel studies, an online questionnaire to newspaper readers and a questionnaire to newspaper designers. The aim was to find out what qualities to bring from print and online to the e-newspaper as initial input in the design process to design a usable and acceptable artifact. The results show both similarities and differences between the two respondent groups.

1 Introduction

Today, we are facing the introduction of a new media, the e-paper based on electronic ink (E Ink) technology [11]. E Ink technology gives a visual impression very close to print on paper. The contrast on the e-paper is as good as on printed paper and no background light is needed, leading to high readability. The power consumption is very low and the technology is not bound to a particular carrier. One example of a product using this technology is the Sony Librié [4].

Due to the paper like qualities of e-paper and the digital distribution, this new technology is very interesting for newspaper publishing with the potential of radically reducing the high production and distribution costs in the news industry. A newspaper on e-paper, here referred to as an e-newspaper, combines many of the qualities of printed paper with the advantages of online media such as constant updates, interactivity and video. Despite all expected advantages of the e-newspaper it will probably not be easy to replace the printed edition since users often stick to experienced ways and behaviours [13]. Newspapers have been published on paper for centuries and on the web for a decade, and the experiences from reading both will most certainly influence the acceptance of the e-newspaper.

In the DigiNews project (ITEA 03015) aimed at proposing an end-to-end solution for the future e-newspaper we are working with designing prototypes of the e-newspaper. Indeed, there are several challenges involved. Firstly, it has to be designed to be recognized as a newspaper in a smaller format. Secondly, it has to offer the experience of reading a printed newspaper. Finally, it has to meet expectations related to the online newspaper. Finally, an e-newspaper probably has to offer added value compared to a printed newspaper if it is likely to successfully replace it in the long run.

In this paper we study what qualities to bring from print and online to the e-newspaper from both a reader and designer view, along with factors expected to influence e-newspaper acceptance. These two views are compared and discussed. The aim is to initiate the process of designing prototypes of the e-newspaper.

2 Newspaper media, usability and acceptance

In this section we give a short description of the most well-known characteristics of printed paper and online newspapers. We then briefly introduce usability and acceptance aspects relevant for the e-newspaper introduction.

The printed newspaper is a very familiar artifact, part of every day life all over the world. Newspapers are associated with a layout of text and pictures, i.e. a reader typically recognize a newspaper even before reading the content, through the appearance of columns and headlines that match her understanding of a newspaper [15]. But newspapers are also characterized by features such as regularity, fresh news and expendability. Further they are associated with characteristics like mobility, simplicity, reliability and convenience [3]. Online newspapers appeared on the web in the mid-nineties and since then they have been developed into becoming a distinct newspaper media with its own characteristics. Many of the visual patterns from the printed newspapers are implemented, but they have also unique characteristics such as archives, news streams and interactivity [5].

The e-newspaper is a new artefact that will lead to new reading experiences. Familiarity is according to Fidler [4] an important attribute of new artefacts or communication forms. New forms of communication or media have seldom been accepted without links to earlier or existing forms. Initially, new artefacts usually resemble the forms of prior technology or communication but over time they evolve into own distinct forms. Therefore, Fidler [4] states that new digital newspapers must have as high readability and simplicity as the printed newspaper, but also added value to be able to compete with the printed newspaper. The most important driver is content and usability, not information technology in it self.

A broad and commonly referred usability definition is the ISO 9241-11 [6] formulated as follows: "*The extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use.*". Recently, usability has been discussed in relation to every day technology [1; 10] and in relation to the consumer appliance market [7]. Both the context and experiences of use influence your expectations of the artefact. Jokela [7, p.33] states that "*users may be happy with poor usability if they have no better experience with a product.*" The usability of the e-newspaper will most certainly be influenced by reader's prior experiences of newspaper media. However, usability is an invisible quality before the new artefact is used in real life and not a factor influencing the decision of start using the artefact [7]. To explain the process of how users accept new ideas and innovations, Rogers [12] describe five attributes, a) relative advantage, b) compatibility, c) complexity, d) trialability and e) observability. The relative advantage regards the added values compared to existing artefacts, in value for the money or other advantages. The new artefact compatibility is to what extent it fits in the users existing needs, values and experiences. Complexity is about the perception of effort required to learn to use the new artefact. Experiences of existing similar artefacts can reduce complexity. The extent to which the artefact can be tested and tried out is referred to as trialability and influences the acceptance of the new artefact. Finally, observability is an expression for that the more users you see using the new artefact, the more likely you are to try yourself. So called early adopters play an important role for observability.

3   Method

We have conducted two parallel studies with readers and newspaper designers. As a third party, i.e. as researchers in the DigiNews project, we are interested in studying whether there exist a common view about what qualities from the printed and online newspapers to bring, and factors that might influence acceptance of the e-newspaper. The first was an online questionnaire to online newspaper readers, and the second a questionnaire to newspaper designers. The questions asked were partly based on usability and acceptance theory.

The online questionnaire was presented for five days during the spring of 2004 at a local publisher's online newspaper, hallandsposten.se, resulting in 337 respondents. A pop-up window was shown the first time a reader entered the front page with a question about interest to answer. This pop-up window was not shown again when re-entering the online newspaper, to avoid respondents to fill in several questionnaires. If the reader chose to participate, the questionnaire was presented. Buchanan and Smith [1] have argued that web samples can be as representative as or more representative than traditionally collected samples because of the heterogeneity of the online population. Although, admittedly there are inherent problems in controlling whom responds to online questionnaires. Control for cases with multiple submissions from the same IP number was handled in the data analysis. A questionnaire with 16 open questions was also sent via e-mail to five newspaper designers within the DigiNews project during the same period of time. The results were analyzed using a coding scheme to identify common as well as differing views.

4   Results

In this section both reader and newspaper designer views are presented according to subjects. The first part of the online questionnaire concerned what qualities readers appreciate the most from the printed newspaper and the online newspaper. The respondents were given statements about qualities and were asked to grade how much they disagree or agree on a four grade scale. All 337 respondents answered. In summary, the answers are presented as follows in table 1:

Table 1: Reader appreciation of qualities of the printed and the online newspapers

| Quality | Strongly disagree (1) | | | | Disagree (2) | | | | Agree (3) | | | | Strongly agree (4) | | | | Mean | |
| | Print | | Online | | Print | | Online | | Print | | Online | | Print | | Online | | P | O |
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%		
Familiar structure	15	4.5	27	8.0	39	11.6	95	28.2	143	42.4	140	41.5	140	41.5	75	22.3	3.21	2.78
Overview	15	4.5	20	5.9	65	19.3	87	25.8	148	43.9	139	11.6	109	32.3	91	82.8	3.15	2.89
Reliability	49	14.5	40	11.9	92	27.3	109	32.3	158	46.9	148	43.9	38	11.3	40	11.9	2.55	2.56
Easy to access	19	5.6	-	-	43	12.8	-	-	134	39.8	-	-	141	41.8	-	-	3.18	-
Mobility	23	6.8	-	-	57	16.9	-	-	102	30.3	-	-	155	46.0	-	-	3.15	-
Save articles	51	15.1	-	-	59	17.5	-	-	79	23.4	-	-	148	43.9	-	-	2.96	-
Paper feeling	113	33.5	-	-	89	26.4	-	-	72	21.4	-	-	63	18.7	-	-	2.25	-
Communi-cation	-	-	25	7.4	-	-	94	27.9	-	-	120	35.6	-	-	98	29.1	-	2.86
Geographic independent	-	-	9	2.7	-	-	10	3.0	-	-	39	11.6	-	-	279	82.8	-	3.74
Updates	-	-	7	2.1	-	-	13	3.9	-	-	100	29.7	-	-	217	64.4	-	3.56
Archives	-	-	8	2.4	-	-	40	11.9	-	-	110	32.6	-	-	179	53.1	-	3.36
Video and sound	-	-	29	8.6	-	-	91	27.0	-	-	112	33.2	-	-	105	31.2	-	2.87
Searching and sorting	-	-	8	2.4	-	-	50	14.8	-	-	121	35.9	-	-	158	46.9	-	3.27

In the questionnaire to newspaper designers, regarding the advantages of the printed newspaper the most frequently mentioned were; the overview, mobility, the brand, familiarity, easy to access and high readability. The advantages with the online newspaper were; updates, interactivity, searchable, archive, navigation, multimedia and geographical independency.

In the second part of the online questionnaire the respondents were asked to choose three qualities from the printed newspaper, and three from the online newspaper that they regard the most preferable to bring to the e-newspaper. The 337 respondents all replied with three alternatives for printed newspapers respectively online newspapers, presented in table 2.

Table 2. Qualities readers regard the most preferable to bring to the e-newspaper

Printed newspaper			Online newspaper		
Quality	#	%	Quality	#	%
Familiar structure	204	60.5	Updates	312	92.6
Mobility	175	51.9	Archives	217	64.4
Easy to access	159	47.2	Searching and sorting	197	58.5
Save articles	153	45.4	Video and sound	146	43.3
Overview	142	42.1	Overview	110	32.6
Reliability	104	30.9	Communication	63	18.7
Paper feeling	69	20.5			

The newspaper designers were asked to describe what qualities to bring from printed and online newspapers to the e-newspaper in an open ended question. In summary the following was mentioned (table 3):

Table 3. Qualities newspaper designers regard as the most preferable to bring to the e-newspaper

Printed newspaper	Online newspaper
- the clear overview of the content, including a beginning and an end, the ease of use, typography and design - the familiarity in design from the printed paper - that mainly the same editorial content should meet all readers, i.e. creating common topics to discuss in social settings - news valuation, e.g. positioning of lead story - mobility, i.e. to be able to read the newspaper everywhere	- continuous updates - the possibility of searching - easy and intuitive navigation - hyperlinks - communication with the readers - possibility to add sound and video.

Thereafter, the readers were asked to grade the importance of factors influencing their acceptance of the e-newspaper (table 4).

Table 4. Factors influencing e-newspaper acceptance from a reader point-of view

Factor	No importance at all (1)		Not important (2)		Important (3)		Very important (4)		Mean
	#	%	#	%	#	%	#	%	
Reliable technology	5	1.5	10	3.0	76	22.6	246	73.0	3.67
Updates	6	1.8	15	4.5	67	19.9	249	73.9	3.66
Ease of use	8	2.4	16	4.7	83	24.6	230	68.2	3.59
Easy to find things	7	2.1	15	4.5	94	27.9	221	65.6	3.57
Environmental consideration	30	8.9	54	16.0	87	25.8	166	49.3	3.15
Appearance	31	9.2	54	16.0	115	34.1	137	40.7	3.06
Latest technology	80	23.7	95	28.2	112	33.2	50	14.8	2.39
Added functions and interactivity	81	24.0	110	32.6	94	27.9	52	15.4	2.35
Possibility to observe use by others	182	54.0	104	30.9	35	10.4	16	4.7	1.66

The five newspaper designers were asked what they think is required for a successful e-newspaper and to rank their suggestions. They answered as follows:

Table 5. Designers views on requirements for a successful e-newspaper

Rank	Designer 1	Designer 2	Designer 3	Designer 4	Designer 5
1	High readability	Easy to find things	Interactivity	Ease of use	Continuous updates
2	Mobility	Geographic targeting	Mobility	Good overview	Ease of use
3	Good overview	Mobility	Personalization	Mobility	Mobility
4	Group targeting		Group targeting		Interactivity
5	Personalization				Personalization
6	Interactivity				Group targeting

The final question in the online questionnaire concerned if the readers would prefer the future e-newspaper to resemble the printed newspaper, the online newspaper or to be something totally new. 41.5 % answered that they would prefer the e-newspaper to resemble the printed newspaper, 19.3 % answered the online newspaper and 39.2 % a totally new look.

5 Discussion and conclusions

There are qualities appreciated and regarded as preferable to bring to the e-newspaper from the printed and the online newspaper, by readers as well as newspaper designers. The results show that reader and designer views are similar in some respects but differ in others. Regarding the qualities to bring from the printed newspaper the readers and designers have similar views, but when it comes to online newspapers the views differ somewhat. For example, the newspaper designers mention the possibility to communicate with readers as an important quality whereas the readers do not find that as interesting. The factors ´ease of use´ and ´updates´, important for acceptance seem to be a common view; the newspaper designers find added functions and interactivity important issues while readers do not.

In conclusion, the perception of qualities and factors influencing usability and acceptance come from experiences from both newspaper media. We argue that these experiences will form reader's expectations and understanding of

the e-newspaper - it will be compared to both. We suggest a synthesis of the best from both worlds, the design and layout from the printed edition and the functionality of the online newspaper, to make the e-newspaper an acceptable and usable every day artefact. These results will be of guidance when designing the e-newspaper in our future work.

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