

The e-newspaper innovation - converging print and online

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Abstract

The new e-paper technology has provided the newspaper companies with the possibility of publishing a portable digital e-newspaper with the same readability as in print media. The e-newspaper is converging print and online with the best from two worlds, i.e. the overview and familiar design of the printed edition and the interactivity and continuous updates of the web. Based on six workshops and 14 interviews with newspaper managers, and three brainstorming sessions with the e-paper steering group (consisting of representatives from the Swedish Newspaper Publishers' Association and eight Swedish newspaper managers) I will discuss the challenges of introducing this new innovation.

1. Introduction

The newspaper companies are facing an innovation, the e-newspaper published on e-paper technology. The e-paper is reflecting, giving the same reader experience as paper (such as high contrast and the possibility to read in sunlight) and is thin, flexible and non-sensitive. The e-newspaper combines the readability and overview from the printed newspaper with the possibilities of online media such as constant updates, interactivity and video, and is predicted to replace the printed edition in the long run. The potential replacement of the printed newspaper with the e-newspaper would dramatically reduce production and distribution costs for the newspaper companies. Despite the obvious advantages with the e-newspaper there are a lot of challenges to meet for a successful introduction.

As early as in 1995, Negroponte (1995, p. 152) envisioned an e-newspaper and pointed at some challenges: *"Imagine an electronic newspaper delivered to your home as bits. Assume it is sent to a magical, paper-thin, flexible, waterproof, wireless, lightweight, bright display. The interface solution is likely to call upon mankind's years of experience with headlining and layout, typographic landmarks, images, and a host of techniques to assist browsing. Done well, this is likely to be a magnificent news medium. Done badly, it will be hell."*

Furthermore, Fidler (1997, p.236) stated that for digital print media *“to function as a practical alternative to mechanical printing and pulp paper, digital print media [...] will need to be highly portable and simple enough for anyone to use without having to read a manual. As with traditional print media, digital forms must be comfortable and convenient to read while lying in bed, riding on a subway, dining in a restaurant, or sitting on a park bench. They will also need to integrate some of the more compelling elements of cybermedia, such as interactivity, hypertext, and audio/video clips, without sacrificing the readability and ease of using paper”*.

The DigiNews project (ITEA 03015) aims at combining the accessibility, simplicity and mobility of printed newspapers, with the advantages of digital media, communication technologies and portable consumer electronics in developing an end-to-end solution for the future e-newspaper. In an early study it was concluded that the design from the printed edition and the functionality of the online newspaper were considered preferable attributes for the e-newspaper, and that mobility, interactivity, adjustment for special target groups and personalization were the most frequently suggested functionalities (Ihlström et al, 2004).

During the last decade we have witnessed a changing media landscape with the introduction and growth of the online newspapers and mobile services. The newspaper companies initially paid attention to the “cannibalization effect”, i.e. the possible negative impact the launch of the online newspaper would have on the amount of subscribers to the print edition (Chy & Lasorsa, 2002). But, at the same time there was an growing conviction industry wide *“that newspapers need an online presence to explore cheaper production and distribution methods; to reverse circulation declines by building a new base of young and computer-savvy readers; to develop new advertising revenue potential; and to protect their advertising base”* (Kamerer & Bressers, 1998, p. 2).

The ongoing diffusion of personal computers, handheld computers, and mobile telephones, as well as the advent of new technologies such as the e-paper, trigger the way news is produced and consumed. With the introduction of the e-newspaper, for example, the editorial and advertising workflows will immediately change and it will not only affect the media house internally, but also the relations between the different players on the market (Ihlström et al., 2005).

Considering the magnitude of changes observed only since the inception of the online newspaper, newspaper organizations need to be attentive to the way new information technologies change the conditions and opportunities for news production.

In this paper I start by briefly presenting the e-paper technology in section 2, to enlighten the reader about its possibilities. I thereafter describe the evolution of the online newspapers in section 3, for comparison to this new digital media. The research method is presented in section 4, followed by a discussion of the challenges of the e-newspaper introduction in section 5. The paper is concluded in section 6.

2. E-paper technology

Electronic paper (e-paper) is the common term for a multitude of different technologies that can be used to produce screens with a number of specific characteristics. In this paper, e-paper is defined as technologies consisting of bipolar pixels. Each pixel can change between two fixed stages. The e-paper is reflecting, giving the same reader experience as paper (such as high contrast and the possibility to read in sunlight). The e-paper is thin, flexible and non-sensitive. In addition, it does not require high battery performance – ultimately, the screen image is stable and fix even when there is no electrical voltage applied.

As of today, there are two technologies for e-paper available on the market – electrophoreses and dipolar rotation. In this paper a third upcoming e-paper technology, called electrowetting is also described.

One commercial product representing the electrophoresis technology is E Ink of E Ink Corporation, USA, developed at Massachusetts Institute of Technology (MIT). Today, E Ink Corporation holds the patent of the E Ink technology and license the production of E Ink displays to a number of corporations, among them Philips (E Ink, 2005).

Electronic ink (E Ink) consists of millions of microcapsules in the size of a hair, containing white positive and black negative magnetic particles floating in a clear liquid (see Figure 1). These white and black particles appear depending on electrical fields being positive or negative. This gives the look of black ink on paper, the contrast is as good as on printed paper and no background light is needed, leading to high readability. An electronic display is created by printing the E Ink on thin, plasticized paper-like sheets which thereafter is laminated with circuits. It is possible to apply E Ink on different materials such as glass, plastic and paper since the technology is not bound to a particular carrier (Philips Research Technologies). This technology gives sharpness six times higher than an ordinary LCD display.

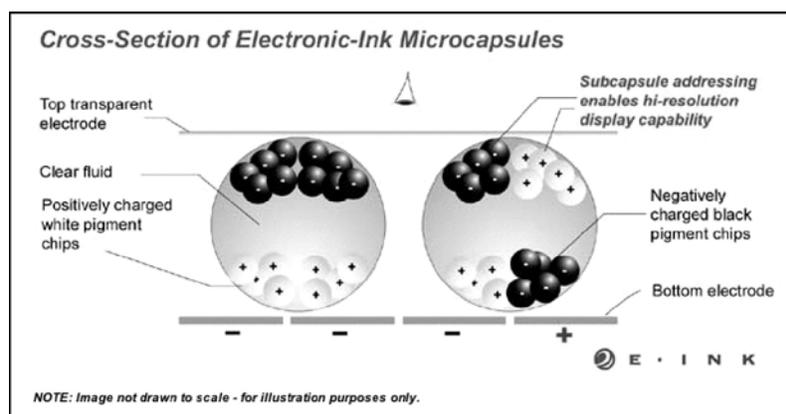
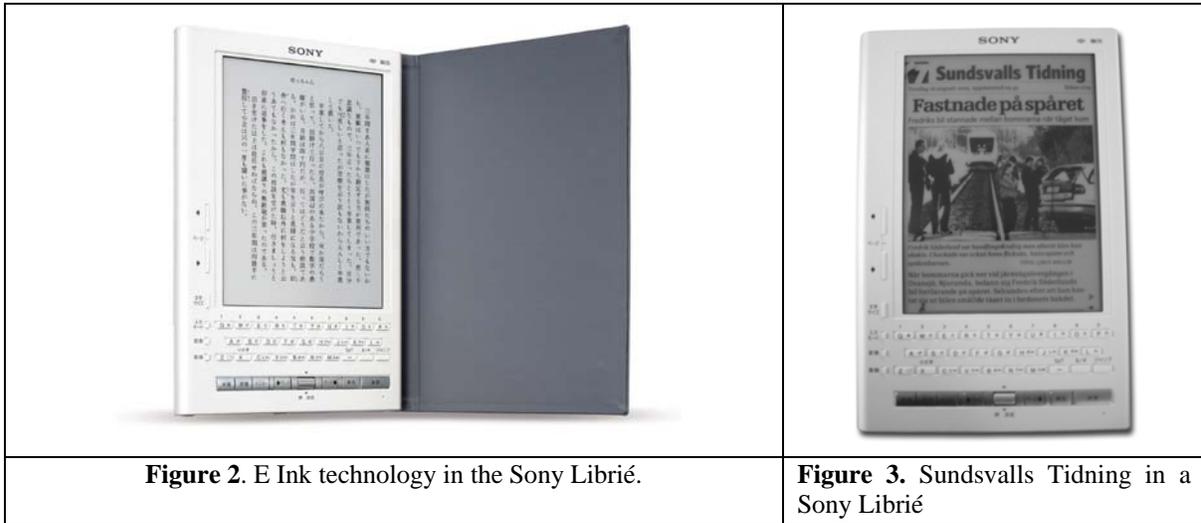


Figure 1. Sketch of the E Ink technology (E Ink, 2005)

In Figure 2, an example of a product based on E Ink technology, i.e. the Sony Librié, is presented and in Figure 3, an example of an e-newspaper prototype of Sundsvalls Tidning is presented in the Sony Librié.



Electronic paper based on bichromal rotation was first invented by Nick Sheridon at Xerox, as early as in the 1970:ies (Gyricon, 2005). Today, the technology is used in SmartPaper by Gyricon LLC in the USA. SmartPaper consist of two sheets of thin plastic with millions of tiny bichromal beads embedded in between. Each bead is smaller than a grain of sand and has a different color on each half. The hemispheres are charged differently – positive or negative.

Electrowetting (Figure 4) is an attractive technology for the rapid manipulation of liquids on a micrometer scale and it can be used to form the basis of a reflective display that is significantly faster than electrophoretic displays, so that video content can be displayed. For the electrowetting display, the focus is on the movement of confined water–oil interface. In equilibrium, a colored oil film lies naturally between the water and the electrode. When a voltage is applied between the substrate electrode and the water, an electrostatic term is added to the energy balance, and the stacked state is no longer energetically favorable (Hayes et al, 2003).

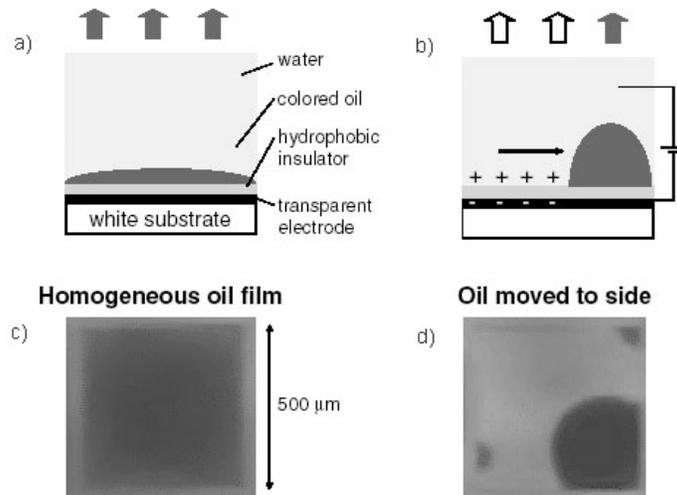


Figure 4. The electrowetting principle (Philips Research, 2005).

3. The evolution of online newspapers

As early as in 1993, newspaper executives started to assess the consequences of the Internet. Some viewed its diffusion as a threat to their industry, while others primarily saw the opportunities associated with this new technology. Addressing this mixed picture, the Newspaper Society, one of the world's largest publisher associations, formed a steering group that was granted considerable research funding from a levy on members. While the resulting reports indeed highlighted threats, they also forecasted significant opportunities for the newspaper industry. In particular, the expertise and trusted brands of newspapers, typically built over decades, were seen as advantages over other media going online (Beamish, 1998).

An online newspaper is created by the convergence of the newspaper and the Internet. As Chyi and Sylvie (2001) describe *"technologically, the Internet enables online newspapers to seek a world-wide market. Practically, most online newspapers are owned by their print counterparts, which also serve as online editions' primary content providers"* (p. 232). According to Boczkowski (2004) the emergence of online newspapers has occurred *"partly as a reaction to major socioeconomic and technological trends, such as changing competitive scenario and developments in computers and telecommunications – trends that, in turn, online newspapers have influenced"* (p. 4).

The first fully web based newspaper, The Palo Alto Weekly, appeared in 1994 (Carlson, 2003) and already 18 months later most American newspapers had their own web sites (Hall, 2001). This short period involved a set of new challenges for the newspapers with regard to: design (layout) of the online newspaper, organizational factors at the publisher side, and changes in audience demographics and preferences (cf. McAdams, 1995).

Describing her own work at the Washington Post, McAdams (1995) portrayed the design challenge as taking *"...a lot of large pages that are covered with printed text arranged almost haphazardly and that are worthless twenty-four hours after they appear and translate them into a medium where their contents will have value indefinitely, be part of a much larger collection of data, be read on small screen in scrolling format, and be searchable in various ways."* (p. 64). Indeed, the new medium involved many important design decisions. These decisions included issues such as the degree of print newspaper resemblance, pros and cons of the newspaper metaphor, and the possible elimination of page one. In view of such design issues, McAdams (1995) concluded that an online newspaper cannot be a strict translation of the print product. The design of online newspapers has been studied by Ihlström and Lundberg (2004) who propose eight design recommendations based on tests and interviews with 153 readers and nine newspaper managers, e.g. "Use the length of the front page to give an overview of the whole site", "Use the broadsheet metaphor for layout" and "Provide news valuation through positioning and markers". A front page analysis on the total population of 85 Swedish online newspapers has been conducted by Ihlström and Åkesson (2004) who suggest a number of layout implications regarding e.g. navigation, advertisements and services. Several other content analyses of online newspapers have also been conducted by e.g. Gubman & Greer, 1997; Tankard & Ban, 1998; Kamerer & Bressers, 1998; Schultz,

1999; Peng et al., 1999; Kenny et al., 2000; Greer and Mensing, 2003 and Zaharopoulos, 2003.

During the late 90s, online newspaper staffs grew considerably. Indeed, the new media required new skills. McAdams (1995) noted that “... *we have learned that to produce an appealing online newspaper, an organization needs good, experienced journalists and good, experienced online people and some people who are both, and all of them need to consult closely and frequently*” (p. 85). At smaller newspaper companies, this often became a challenge for technology-interested journalists. In Germany, for example, the average online editorial board consisted of three people in 1997. In one third of these boards, this staff also worked for the print edition (Neuberger et al., 1998). At large newspaper companies, the online staff was much larger. At the Washington Post, for instance, 100 people were employed for online news production already in July 1997 (Kirsner, 1997).

Following such growth, approximately 90 percent of the US online newspapers lost money in 1996 (Levins, 1997), but kept on investing in search of new audiences and ultimately new markets. The online newspapers indeed reached new audiences, e.g. people not reading the paper counterpart (Chy & Lasorsa, 1999) and younger readers (Coats, 2002). At the same time, however, they also struggled to meet their different preferences. As McAdams (1995) described it, “*some users want the online service to be a perfect mirror of the day’s Washington Post, and others want an altered, online-adapted version*” (p. 73). While the audiences grew and still grow (Coats, 2004), making a profit on online newspapers was and still is a challenge. For example, the New York Times announced at the end of 1999 that their expected losses from their online operations would grow more than 100 percent in 2000 (Moses, 1999).

Boczkowski (2004) has conducted a longitudinal study at three online newspapers and concluded that three factors have shaped their innovation paths and media artifacts: relationship between the print and online newsrooms, user views and news production. Print newsrooms have the advantage over online newsrooms in that they have been around for a long time, have standardized procedures and most online newspapers have to a large extent been financed by the revenue from the print edition (Boczkowski, 2004). However, in the initial years the traditional newsroom production in the print and online newsroom remained relatively unchanged. The primary work task in the online newsroom was to select and re-format stories from the print edition (Martin, 1998). In 1999, almost half of the respondents expressed that their online edition differed from their print edition due to either taking advantage of the unlimited space for in-depth coverage or to limit the length and number of stories presented (Peng et al., 1999). According to Tankard and Ban (1998), the average percentage of original content in online newspapers was 13 percent in 1998, suggesting a heavy recycling of material from the print edition. However, the 1999 survey of Chyi and Sylvie (2001), with a mean of 22% of online newspapers providing unique content and 40% in the Börjesson (2002) study, suggest an increase in this area.

The first Swedish newspaper with an online version was Aftonbladet in 1994 (Ahlström et al., 2001). Already in 1997, 37 percent of the Swedish dailies had established an online edition (Hedman, 1998a), a figure that increased to about 82 percent in 2002, but decreased to 75 percent in 2003 (WAN – World Press Trends, 2004). The two initial main reasons for the Swedish newspapers to go online were to reach a potential future market and to enlarge their audience and to reach the youth (Hedman, 1998b). This is partly in line with the findings of Peng et al. (1999) who found that important reasons for going online were e.g. reaching more readers (40%), generating income through advertising (26.9%) and using the online edition as a promotional tool of their print products (23.9%). They conducted an e-mail survey and a content analysis of 80 U.S. daily newspapers, and also found that revenues from advertising only covered part of the cost for publishing the online newspapers. Though, questions about the economic viability of online newspapers were raised early (Molina, 1997). Molina argued that even though the Internet provided the newspapers with a relative low-cost way to enter “multimedia learning”, major business issues and dilemmas had to be solved before the commercial online newspaper could take off. Indeed, profitability was a particular sensitive issue for online newspapers. In the study of Neuberger et al. (1997) for example, none of the 63 German online newspapers made any profit, all were making a loss on their online newspapers.

During 2002, the most important question facing the media companies in Sweden was the financing of their online newspapers. They had to find ways to profit from their online ventures otherwise they could not go on (Hedman, 2002). This was due to the deterioration of the newspapers’ economies in 2001 because of the recession in society, which resulted in less investment in advertising. The strategies for increasing profitability varies among the Swedish newspapers, e.g. developing special fields, integrating the print and online edition, re-edit information and publish it in new forms, portals, and local markets on the Internet (Hedman, 2002). From a study with 153 readers and nine newspaper managers the results suggest that management and users agree on the importance of archives, personalized and deep news content, and a role for the newspaper as intermediary for future services (Ihlström & Palmer, 2002).

Based on a longitudinal study of three newspapers, Ihlström and Henfridsson (2005) discuss the online newspaper evolution regarding e.g. internal organization, view on organization, in-house attitude, dedicated employees, strategy and profitability. They argue that online newspapers have established a number of communicative practices significant for recognizing them as a distinct digital genre, but at the same time demonstrate the emergence of sequential interdependencies between online and printed news. The online newspapers are now considered a valuable part of the media houses.

4. Method

This research can be classified as qualitative Information Systems research (Orlikowski & Baroudi, 1991; Walsham, 1995) in that it is orientated towards people’s assumptions, knowledge, and experience of newspaper media. In particular, the newspaper

representatives' predictions of the challenges of introducing a new digital media, such as the e-paper were of interest.

The research was conducted within the DigiNews project (ITEA 03015) with partners from Belgium, Spain, Netherlands, France and Sweden. The project was initiated by Philips Applied Technology in Belgium together with the Swedish Newspaper Publishers' Association. The Swedish partners are Aftonbladet (AB), Göteborgs-Posten (GP), Nerikes Allehanda (NA), Norrköpings Tidningar (NT), Sundsvalls Tidning (ST), Sydsvenskan (SS), Östgöta Correspondenten (ÖC), the Swedish Newspaper Publishers' Association (TU), the Royal Institute of Technology (KTH) and Halmstad University (HH). European partners from the media sector are Concentra Media, De Telegraaf and Le Monde. The overall goal of the project is to explore research and development issues for an electronic newspaper of the future. The project aims at combining the accessibility, simplicity and mobility of printed newspapers, with the advantages of digital media, communication technologies and portable consumer electronics. The two year project will be finished at mid-year 2006.

Different types of data collection methods have been used (see table 1), i.e. interviews with 14 newspaper managers and designers, six workshops with newspaper representatives from management, IT, marketing and design, and three brainstorming sessions with the e-paper steering group (consisting of representatives from the Swedish Newspaper Publishers' Association and eight Swedish newspaper managers).

Table 1. Data collection activities

Interviews	Workshops	Brainstorming-sessions
NT (August 25 th 2004) Editor-in-chief new media	GP (June 2 nd 2004) – 6 participants	August 25 th 2004
ÖC (August 25 th 2004) Business developer	SS (September 17 th 2004) – 8 participants	March 8 th 2005
SS (September 16 th 2004) Marketing manager	ST (October 6 th 2004) – 5 participants	September 29 th 2005
SS (September 16 th 2004) Layout director	AB (October 20 th 2004) – 3 participants	
ST (October 6 th 2004) Quality Assurance Manager	ST (October 7 th 2004) – Design focus group	
ST (October 7 th 2004) Editor	ST (November 24 th 2004) – Design focus group	
ST (October 7 th 2004) Web publisher		
AB (October 20 th 2004) Editor-in-chief new media		
AB (October 20 th 2004) Layout director		
GP (October 27 th 2004) Development director		
GP (October 27 th 2004) Managing Development Editor		
ST (November 24 th 2004) CEO		
Concentra Media (March 23 rd 2005) Head of research		
NT (April 27 th 2005) Head of Editorial Department		

4.1 Interviews

The interview study included a total of 14 respondents interviewed. Each of the semi-structured interviews was about 90 minutes in length. The semi-structured interview guide used at all sites facilitated the consistency of data collected between sites and interviewees. While allowing individual perspectives and experiences to emerge, the interview guide provided a systematic way of delimiting issues discussed in the interview (Patton, 2002). It covered a variety of topics such as organization, technology, business models, new services and design. All respondents had key functions within respective newspaper, e.g. editor-in-chiefs, managers, or designers (see Table 1).

The interviews were all transcribed. In order to analyze the data collected, patterns were identified in the transcribed material. A coding system (Miles & Huberman, 1994) was used, based on different colors, to analyze the data. I started out with the basic themes from the interview guides, assigned each a specific color, to mark sections in the transcribed material. When all data was categorized according to a corresponding theme, the data was transferred into separate documents, named after the theme. I then searched for patterns, i.e. similarities or differences in the data, which I coded directly in the digital document, marking in different colors. Then, each of these themes was examined in light of retrieving challenges of introducing the new e-paper innovation.

4.2 Workshops

The newspaper staff at the four first workshops was selected to represent managers, designers, marketing and IT people. In the beginning of the project we formed a design focus group consisting of representatives from Aftonbladet, Göteborgs-Posten, Norrköpings Tidningar and Sundsvalls Tidning that were specifically interested in design issues of the future e-newspaper. Two of these full day workshops concerned strategic issues as well and are therefore included in this paper (see Table 1).

The workshop approach in the first four workshops was designed to be carried out during a three hours session, including a 15 minute break. It consists of three different phases; a visioning phase, a scenario building phase and a mock-up phase.

The visioning phase draws on future workshops techniques (Jungk & Müllert, 1996; Kensing & Halskov Madsen, 1991). The aim of the visioning phase was to introduce the technology, identify problems and to remove barriers that could limit the creativity in the scenario building phase. The visioning phase includes three parts, i.e. introduction, trigger and critique. The critique part is inspired by “The Critique Phase” from future workshops (Jungk & Müllert, 1996) and is basically a structured brain-storming that focuses on problems related to the question at hand. The problems are then grouped in collaboration with the workshop leaders. The scenario building group activity was aimed at retrieving suggestions of future use and services for the e-newspaper. Scenarios are “stories about people and their activities” (Carroll, 2000) and focus on describing a stakeholder view of what, how and why a particular instance of use happens and can be presented in text, story-boards, video mock-ups, scripted prototypes etc. Scenarios allow discussions of contexts, needs and requirements and are often the first step in establishing stakeholder requirements (Preece et al., 2002). The last phase, the mock-up activity was an individual activity which enabled each participant to be creative by making mock-ups of the future e-newspaper. Mock-up techniques are ways to make effective use of the users’ experience and knowledge, as well as ways of experiencing the future, and can be very useful early in the design process (Ehn & Kynd, 1991). Mock-ups, paper prototypes or interface sketches can be useful aid when discussing and communicating ideas between different stakeholders (Preece et al., 2002).

The whole session was recorded and some parts were also filmed. The identified problems in the critique part were all written down and some of the discussions according to these issues were later transcribed.

4.3 Brainstorming sessions

Brainstorming is an idea generating technique. Its main goals are to break us out of our habit-bound thinking and to produce a set of ideas. Brainstorming is useful for attacking specific problems and where a collection of good, fresh, new ideas are needed (Osborne, 1953).

The brainstorming sessions with the e-paper steering group were all conducted at the premises of the Swedish Newspaper Publishers' Association and lasted between two to three hours. I acted as moderator and wrote down all main ideas on a white board. The sessions were recorded and later transcribed. The second session started with a summarization of the first and so on.

5. Challenges of the e-newspaper introduction

Five different stakeholders were initially identified within the DigiNews project; content providers (publishers), readers, advertisers, device producers and infrastructure providers. For each of the stakeholders a number of issues (challenges) have been identified. These issues have been derived from interviews, workshops and brainstorming sessions adding to a "map of challenges" (see Figure 5). This map has been discussed and verified with the e-paper steering group and with Concentra media, and at these occasions some issues were added. After that it was presented and discussed with a focus group of readers and advertiser representatives. Finally, the map was discussed within the DigiNews consortium (also representing the device producer). The issues have then been grouped into themes and will be discussed hereafter from a publisher point-of-view.

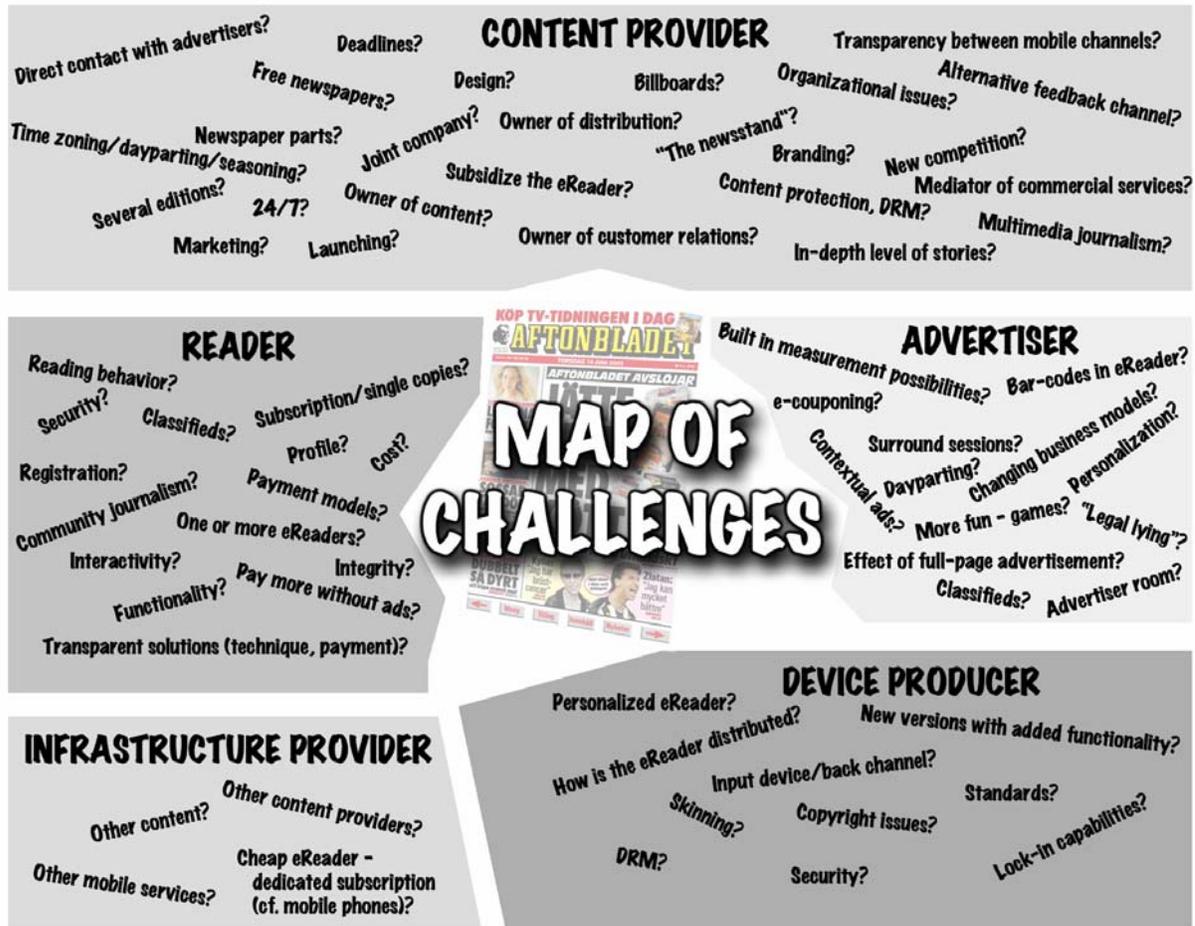


Figure 5. Map of challenges

5.1 Content provider (publisher)

The 26 identified issues concerning the content providers have been grouped into five different themes; ownership, business models, organization, product and advertising (see Table 2).

Table 2. Content provider themes and issues

Ownership	Business models	Organization	Product	Advertising
Owner of distribution?	Subsidize the eReader?	Organizational issues?	Design?	Timezoning/dayparting/seasoning?
Owner of content?	"The newsstand"?	24/7?	Several editions?	Direct contact with advertisers?
Owner of customer relations?	New competition?	Deadlines?	Newspaper parts?	
Content protection, DRM?	Free newspapers?	Multimedia journalism?	In-depth level of stories?	
Joint company?	Billboards?		Transparency between mobile channels?	
	Marketing?		Alternative feedback channel?	
	Launching?			
	Branding?			
	Mediator of commercial services?			

One of the major issues regards ownership of distribution and customer relations. Today most Swedish newspapers have control of the distribution and own the billing of the printed edition. Concerns were raised about the possibility of other actors owning the

distribution, e.g. telecom operators. Should media companies form their own company that handles the distribution and the billing? The revenue split has to be in favor of the newspapers, not as today's mobile services with a very low revenue percentage, if the e-newspaper idea would be realized.

“The most expensive in our organization is the distribution, and that is why newspapers like the Metro have started. They have got rid of the heavy burden to deliver the newspaper to private households. Instead they deliver by the bulk. It will be different with the e-newspaper. There is a lot to save distribution wise.”

Several models for distribution have been discussed, e.g. broadcasting via DAB, WLAN or via the Internet. The publishers are also concerned about digital rights management and ownership of the content. It is essential that it still is a clearly branded newspaper product that is distributed to the eReader.

“There are endless opportunities for newspaper companies with e-paper. It would be so much inexpensive for us. We would not have to buy costly paper and the expensive printing press that binds a lot of capital and we could get rid of the costly distribution. It would be idealistic for us if the readers would accept the e-newspaper.”

Strategic issues depending on the view of the e-newspaper have also been raised, i.e. if the e-newspaper is going to replace the printed edition, what about investments in new printing presses?

“It would be ideal if we only had e-paper and no paper, but it will take a long time to build this channel during a transitional period.”

Finding business models that will work in this new setting is prioritized within the DigiNews project. Discussions about the launch of the eReader device have been discussed, e.g. should it be subsidized by the newspaper companies when a reader signs a subscription or should it be sold in stores. Should the eReaders be branded by newspaper companies or could new players on the market subsidize the eReader with their brand? Should the eReader be looked to a single subscription or should it be possible to buy different news products?

“The savings we can make in reduced print and distribution cost could be used to subsidize the technique. If the customers wants to have both e-paper and paper, one could subsidize the eReader, or arrange an additional subscription. 2/3 of the revenue has to come from advertisements.”

Questions like “How should the reader be able to buy subscriptions, single copies etc?” and “How about the billboards?” have also been raised. Could a joint company as discussed above present all available news products in a “newsstand”, which also handles the billboards?

The introduction of the e-newspaper could raise new competition between morning papers and evening press, since both could be delivered at the same time. The free newspapers could also raise competition in this new context. The media companies are also concerned about the marketing, should this product be treated as a new channel or a new brand?

The e-newspaper is predicted to attract new younger readers and in Sweden subscribers in sparsely populated areas is one initial target group.

“We are thinking of replacing the printed edition with the e-newspaper for those who lives far way in our distribution net to reduce costs, but it is the ‘wrong’ generation that lives out there now. This will take time.”

New roles of the media companies have also been discussed, e.g. mediator of commercial services, e.g. tourism services, brokering etc, but also a new moderator role to support community journalism.

“There are lots of things to do with the e-newspaper. One could offer tips for events and even mediate tickets. Coverage services that alert the reader when something of interest is available are also a possibility.”

“Students should be able to download their literature, which is important added value. Then they maybe read the newspaper as well. Maps, event calendars, town guides, and traffic information are possible services that we could mediate.”

As stated in the introduction the editorial and advertising workflows will immediately change with the e-newspaper, involving personalization issues. The possibilities of constant updates challenge the deadlines of the printed edition and also put strains on the organization for coverage 24/7. The view of the e-newspaper as a new channel or a new product that eventually will replace the printed edition will influence the organization.

“There will be changes in working roles and also mental changes. There will be a need for more technicians. Paper-boys will disappear, the editors in today’s sense and the news desk will be different.”

The multimedia possibilities also create a need for multimedia journalists and for the sales organization to consider yet another arena for advertisements. Indeed, there are organizational challenges with the e-newspaper introduction.

”In the future there will be a need for multimedia journalists. But there is resistance against this, both from the union and from journalists.”

The e-newspaper product has been discussed in depth. An alternative to constant updates 24/7 could be to release several editions a day, e.g. a morning edition, a lunch edition and an evening edition.

“One has to have more publishing occasions, but maybe not in the middle of the night. I don’t know if it should be updates on special occasions or continuous updating. It could be good to have scheduled updates because then the readers will know when there will be something new.”

With this scenario the actual content and advertisement could change during the day, e.g. more leisure content in the evening. As there are no limitations on the amount of content, in-depth stories with background information could be offered or thematic issues concerning special events. Regards the possibilities for the reader to “create her own e-newspaper” by buying newspaper parts from different newspapers, e.g. the local news from Sydsvenskan, the sport section of Aftonbladet, financial news from Dagens Industri etc, has been discussed and was seen as a realistic alternative in this context.

“My philosophy around the e-paper is that we can combine the best from the printed edition with the best from the web. But it has its limitations. One could not as easily get an overview as in the printed edition. But, if one creates something that resembles the printed newspaper and combines it with the interaction and quickness of the web, it would be something new, something special.”

A feedback channel has also been discussed, in order to enable reader interactivity. Should this initially be in the eReader device or should it be handled via mobile phones or the Internet? The media companies have also raised the issue of transparency between the mobile channels, they have to find ways of re-using content in an easy way.

“It has to be very simple and easy for the readers, usability you know. It should not require a lot of programs, it should be like the TV, just to press a button, and just as easy as to read the printed edition. We could not market anything that is difficult.”

The design of the e-newspaper has been paid special attention. Within the design focus group, three e-newspaper prototypes have been designed. The issue of size is essential, the initial eReaders will be in approximately A5 size, but preliminary results suggest that the readers would prefer A4 size. We have therefore chosen to design Aftonbladet in A4 size and Göteborgs-Posten and Sundsvalls Tidning in A5 sizes (see Figures 6, 7 and 8).

“The first challenge is how to mediate the drama from an evening press to an A4 size? And how does one mediate the easy-going, catchy things that attract readers? Beginning and end is important, as well as the familiarity of the newspaper. The second challenge is the reading experience. How does one create the feeling of the reading moment, to treat oneself with the e-newspaper?”

The design philosophy has been to keep the newspaper feeling from the printed edition with the familiar layout, structure with sections, and a beginning and an end. But also to support navigation as we have been used to on the Internet, e.g. possibilities to enter a section directly etc. We have introduced indexes to support this as well as clearly defined newspaper parts.



Figure 6. Aftonbladet in A4 size



Figure 7. Göteborgs-Posten in A5 size



Figure 8. Sundsvalls Tidning in A5 size

Each eReader will probably need to have a unique identification, which enables content and advertising personalization. The updating or several issues capabilities enable timezoning, dayparting and seasoning both regarding content and advertisements. One possible downfall could be if advertisers would consider passing the media companies by and go directly to other parties that offer eReaders.

5.2 Reader

The 15 identified issues concerning readers have been grouped into five different themes; personalization, business models, device, advertisements and role (see Table 3).

Table 3. Reader themes and issues

Personalization	Business models	Device	Advertisements	Role
Registration?	Subscription/single copies?	Transparent solutions (technique, payment)?	Pay more without ads?	Community journalism?
Profile?	Cost?	Security?	Classifieds?	Interactivity?
Integrity?	Payment models?	Functionality?		
Reading behavior?	One or more eReaders?			

The reader need to register in order to receive her e-newspaper. The issue is where to register; will it be at an individual newspaper, at the joint media company or at the device producer? Is the reader more likely to add to their profile if it is placed at their local and trustworthy newspaper? The profile could be a revenue source in that it enables targeted advertisements. But what about the integrity of the reader? Personalization has to be in

the terms of the reader. As we have noticed with the introduction of the online newspapers the reading behavior changed compared to the printed edition. What new reading behavior will the e-newspaper create?

From a reader perspective it is essential to be able to buy multiple newspapers to one eReader. It should, for example, be possible to have a subscription of your morning paper and to buy single copies of evening press. For a successful launch of the e-newspaper, the cost has to be lower than the printed edition or it has to provide a good deal of added value.

“It is a matter of cost how much added value that can be supplied to the e-newspaper, but it has to be more than in the printed edition. It is essential that it is not apprehended as a poorer newspaper. For example one could add video clips.”

Several payment models have been discussed, e.g. prepaid account, mobile phone, credit card etc. The key issue is to make it as easy and intuitive as possible.

In a household with more than one reader, the different parts of the printed edition are usually divided between the members. How will that be solved with an e-newspaper? Should there be a reduced cost for additional eReaders? If you buy more than one eReader, should your subscribed morning paper be delivered to both eReaders? Would there be an additional cost for this?

“One could add different levels of subscription. One could do different advertisements, making it interactive, targeted. With this channel you could also reach readers at a very local level, e.g. local information TV. There will be new business models developed in different areas, but in principal the consumer has to pay and also those who want to reach out with their commercials.”

It is essential for the device to be easy to interact with. It has to have transparent solutions and it must also be secure for the reader to make payment transactions. The device has to offer functionalities to support e.g. saving (separate articles, whole editions), searching and printing.

As the readers appreciate the classifieds they have to be placed in the e-newspaper. Maybe they can even be searchable like on the web. The question whether readers would be willing to pay more to have content without advertisements has also been raised.

The e-newspaper with a feedback channel creates possibilities for reader interaction. For example, the reader could send in the results of her cross word puzzle or send a comment to an article. Taking this a step further, the e-newspaper could be an arena for community journalism to provide news at a very local level.

5.3 Advertiser

The 13 identified issues regarding advertisers have been grouped into three themes; business models, product and measurement (see Table 4).

Table 4. Advertiser themes and issues

Business models	Product	Measurement
Changing business models? Dayparting? Personalization? Bar-codes in eReader? e-couponing?	Contextual ads? Classifieds? Surround sessions? Advertiser room? More fun – games?	Built in measurement possibilities? Effect of full-page advertisement? Legal lying?

Will the business models change with the e-newspaper? Would the personalization possibilities create an increased interest from the advertisers, e.g. only reach all readers that live in a certain area, own their houses or have small children? With dayparting it would perhaps be interesting to only advertise for lunch specials at lunch time, and for theater tickets in the evening.

One big issue for many readers is the coupons in the printed edition. How should this be supported in the e-newspaper? Should it be bar codes that will be read at the cashier in the store, or should they maybe be transferable to the mobile phone?

The e-newspaper creates a new arena for advertisements. Contextual ads, e.g. Nike on the sports section should be supported as well as the classifieds. It could also be possible to support surround session like in the New York Times where you always have ads according to your profile following you throughout the whole e-newspaper. It should also be possible to create a special “room” for the advertiser. By clicking on an ad you arrive to the advertiser room where additional information could be published, e.g. a product catalogue. In this way the reader does not leave the e-newspaper as they might do if the click on a banner on the web.

“On could also commercialize electronic paper in the way that the advertiser could have more information space and pay us more for that. My vision is that one should be able to click on a piece of clothing and be able to see it in all available colors.”

It could also be a way of “legal lying” by e.g. present only a mobile phone in the ad, encouraging the reader to click on it, and when clicking the reader is presented with the legal details that usually are presented in a very small size. Games or other interactivity could also be used to attract readers.

“The ads will change due to interactive possibilities, to get direct feedback. There will be more targeted advertisements. One will know so much more about ones subscribers.”

In order to attract advertisers it is essential to be able to show reach. By incorporating measurement possibilities in the device, this could increase the interest of the advertisers.

But what about the full page ad? Would the readers choose to skip them by clicking next page immediately in this flat medium?

5.4 Device producer

The 10 identified issues regarding device producers have been grouped into three themes; product, legalities and distribution (see Table 5).

Table 5. Device producer themes and issues

Product	Legalities	Distribution
Personalized eReader? Skinning? Input device/back channel? New versions with added functionality? Standards? Security?	Copyright issues? DRM?	How is the eReader distributed? Lock-in capabilities?

There are several issues that concern the product in order to get a successful launch. With the mobile phone industry in mind it should be possible to personalize your eReader by for example skinning. Maybe the reader would like a red or blue frame, or should it be in steal? The possibility of interacting with the eReader through a stylus or touch screen and a back channel are essential to support interactivity. The standards that will be established are important as well as to provide a device with secure transactions. Should the eReader launching strategy involve several versions, each adding to functionality? There are several issues concerning copyright issues and digital right management. Would the device producer be a candidate for the distributor of the e-newspaper? Which will the capabilities of lock-in be?

“It could not be as with the Sony Librie, it is clumsy and have a too little display, almost like a PDA which has a limited range of application. Above all limited for evening press that work with large spreads. Maybe not for smaller local newspapers. It has to be more mobile, easy to bring, flexible and not sensitive. And it is essential that it is in color.”

5.5 Infrastructure provider

The four identified issues regarding infrastructure providers have been grouped into 3 themes; service, subvention and competition (see table 6).

Table 6. Device producer themes and issues

Service	Subvention	Competition
Other content? Other mobile services?	Cheap eReader – dedicated subscription (cf. mobile phones)?	Other content providers?

There are several infrastructure providers that could be interested in the e-newspaper, both Internet service providers and telecom operators. They will of course be interested in other content and services than the e-newspaper. There could also be a possibility of them subsidizing the eReader by looking the reader in for a period of time, c.f. mobile phones.

There will also probably be competition from other content providers that wants to take the role of the distributor.

6. Discussion and conclusion

Looking back at the online newspaper introduction more than a decade ago, facing the introduction of yet another digital media, the e-newspaper, several similarities could be found. The e-newspaper is predicted to replace the printed edition in the long run, due to the readability being as good as in print and the possibilities of great reduction of production and distribution costs. But, it is most likely that the e-newspaper innovation will evolve into a genre that converges print and online.

In this paper I have discussed the challenges of the e-newspaper introduction from a publisher point of view. The challenges could be summarized into three major areas; design, organization and business models.

Initially the online newspapers experimented with the design, often this was done in-house by dedicated employees, and most newspapers tried to find their own style. But over the years the design of online newspapers has evolved into a well recognized digital genre. Special items such as the news stream and the archives have been introduced and the front page has become the main navigational tool, becoming longer and longer and containing appetizers to all available content. The challenge of e-newspaper design lies in supporting both linear reading as in the printed edition and browsing as on the web and to provide an overview of the content. In the DigiNews project we have together with newspaper designers produced three e-newspaper prototypes designed according to the above. These prototypes are currently under testing, and the results will guide us in further development.

Regards the organization, some online newspapers initially were organized as project organizations. The in-house attitude was often skeptic and the development was driven by dedicated employees. But over the years the online editions have become an important asset to the media houses and have received a higher status organization wise. Often they are organized as one of the editorial desks. The challenge has been to change from steady deadlines into 24/7 reporting and to be able to use the web for publishing breaking news before they end up in the printed editions. Today, journalists are frequently writing for the web. As the e-newspaper enables either several editions a day or continuous updates 24/7, the experience from the online newspapers will be valuable. It might be a challenge to have the journalists to meet multiple deadlines every day. The need for multimedia journalists might also be a tough challenge to meet as well as to have the sales organization adapt to having yet another channel to consider while selling ads.

Online newspapers have struggled to find lucrative business models over the years with varying results. Initially the online newspapers had the freedom to experiment with the technology and to come up with additional services as added value for the readers, but they failed to profit from this. But, over the last few years some of them have succeeded with payment services for additional content and supplemental services such as weigh

loss programs. The banner sales have also grown over the years as the advertisers have recognized the media. It is fair to believe that the advertisers will follow to the e-newspaper once the readers have adopted the media. The advantages of the high readability and the mobility of the e-newspaper support the idea of possible lucrative services, such as mediated and location based.

Indeed, there are a lot of challenges associated with the e-newspaper introduction. Taking the e-paper advantages serious, but with the online newspaper evolution in mind, the newspaper companies are determined not to repeat some of their initial mistakes by going digital, while planning for the e-newspaper introduction. Future research will involve more activities with newspaper readers and advertisers in order to get a more comprehensive view of the e-newspaper innovation.

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