

# Abstract

Convergence implies that previously unlike areas come together, approaching a common goal. A subordinate concept of convergence, i.e., media convergence, is a concept that has become common when denoting a range of processes within the production of media content, its distribution and consumption. The concept of media convergence has achieved buzzword status in many contexts due to its widespread use.

The concept is not new and has been discussed by researchers in many academic fields and from several different points of views. This thesis will discuss media convergence as an ongoing process and not an end state.

Newspapers are one of many so-called publishing channels that provide information and entertainment. They have traditionally been printed on paper, but today's digital technology makes it possible to provide newspapers through a number of different channels. The current strategy used by newspaper companies involves a process of convergence mainly regarding multiple publishing. A newspaper company interested in publishing content through multiple channels has to adapt its production workflow to produce content not only for the traditional printed edition, but also for the other channels.

In this thesis, a generalized value chain involving four main stages illustrates the production workflow at a newspaper company in relation to the convergence processes. The four stages are creation, packaging, distribution and consumption of content.

The findings of the thesis are based on studies of the newspaper industry in Sweden and reflect specific newspaper companies, their strategies, production workflow and ventures from 2002 to 2005. The methods used have been case studies, literature studies and scenarios.

Some of the conclusions of the thesis indicate that convergence processes have steered the newspaper companies' development towards multiple channel publishing. Advancing technology and mergers between companies have contributed to the processes of convergence. However, the new publishing channels have been described as threatening to the traditional printed editions since they compete for consumers' time and advertising revenues. Convergence of technology has made it possible to store, edit and publish material over many different networks using the same tools and the same database system. If the content is stored in a neutral format, it can be packaged and used in many different types of publishing channels. However, according to the studied newspapers, a fully automated workflow for all publishing channels is undesirable and impossible to achieve with the existing technology, standards and organizational structure.

This licentiate thesis will discuss some of the strategies behind multiple channel publishing, production workflows and market conditions to detect how the newspaper industry is coping with media convergence.

# Foreword

This licentiate thesis, which is half way to a doctoral degree, was written between the years of 2002 and 2005. The supervisor of the thesis has been professor Nils Enlund at Media Technology and Graphic Arts, School of Computer Science and Communication, The Royal Institute of Technology (KTH) in Stockholm, Sweden. I am grateful for his advice and guidance while writing the papers and thesis. I would also like to express my gratitude to all the companies that have participated in the studies for the included papers of this thesis.

Being a researcher, and a young female one at that, is challenging, fun and extremely hard. So far, it has opened many doors for me, taught me things I had never before heard of, trained me to cope with all kinds of situations and taken me on many journeys, not only in life, but also to many interesting countries in the world. The profession has given me the opportunity to attend doctoral courses in developing areas, such as Wearable Computers or Art and New Media, and has given me the possibility to attend many interesting conferences and events. I am tremendously grateful for the opportunities this profession provides.

Writing this thesis could never have been done without the support from my colleagues at the department of Media Technology and Graphic Arts, especially Christer Lie, Sara Leckner, Mona Eriksson and Mariann Berggren.

Special thanks goes also to my former colleagues Lena Halonen, Elke Dall and Katarina Båth, and to all the people that have been acknowledged in the included papers.

Most importantly, to my dear family and friends: thank you, and big hugs!

I hope you all enjoy reading this!

Ester Appelgren  
Stockholm, June 2005



## List of Included Papers

Paper I – "Convergence and Divergence in Media – Different Perspectives", by Appelgren, E. ICCC 8<sup>th</sup> International Conference on Electronic Publishing 2004, Brasilia, Brazil.

Paper II – "Evaluating Digital TV as a Publishing Channel for Newspapers", by Appelgren, E. and Nordqvist, S. TAGA 2003 Proceedings, Rochester.

Paper III – "E-Paper Production Workflow – Adapting Production Workflow Processes for Digital Newsprint", by Appelgren, E., Sabelström Möller, K., and Nordqvist, S. TAGA 2004 Proceedings, Rochester.

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# 1 Introduction

Developments in technology and the production of content in media have contributed to a change in the consumption of newspaper content. According to the World Association of Newspapers, on-line newspaper readership has risen 350% during the first five years of the 21<sup>st</sup> century and the number of newspaper websites has doubled since 1999 (WAN, 2005). Information technology, such as the Internet, has given media companies new possibilities, making newspapers more of a service than a product where the organisations resemble “information engines” rather than printing organisations (Ifra, 2002).

The possibilities offered through technological development are creating a need for new organisational structures and redefined occupational roles within the media companies. The investments made in new publishing channels also call for new strategies in terms of technological equipment, content sharing and business models. Picard (1997) describes how newspaper managers publishing in multiple channels today are facing a variety of challenges that are forcing them to reconsider their traditional selection of content, presentation of material to readers and policies regarding compensation for journalists. Some of these changes in organisational structures, such as the combination of the media and telecommunications industries, or in the production processes, such as developments of digital technology and integration of different elements in the media, are denoted as media convergence (Briggs and Burke, 2002).

This thesis will discuss media convergence from different perspectives, with a starting point of media convergence as an ongoing process occurring at various intersections of media technologies, industries and audiences, as Jenkins (2001) describes it. Therefore, the concept of convergence is divided into processes of convergence and effects of convergence in this thesis. The title of the thesis refers to a quote by Boorstin from the book “The Republic of Technology” from 1978 (quoted in Briggs and Burke, 2002). He refers to convergence as “the tendency for everything to become more like everything else”. This quote was chosen because of its simplicity in describing what many researchers in the author’s opinion have failed to define by making their convergence definitions too complex or too much of a niche definition.

Based on the assumption that newspaper companies will increasingly become multiple channel publishing companies in the near future, this thesis discusses both the similarities and differences in the production workflow at newspaper companies by observing strategies and organisational structures of different publishing channels. Because the production workflow for content publication in one publishing channel might be adaptable to other publishing channels, variations between the channels in relation to the convergence processes between the different channels have also been studied.

The work included in the thesis was carried out between January 2002 and May 2005 and the thesis is based on three previously published papers. The first paper covers the concept of convergence in media, while the two following papers serve as examples of multiple channel publishing influenced by the processes of convergence. However, the thesis starts with an introductory scenario set in 2005. This scenario is intended to illustrate everyday life and our relationships with the different media channels that surround us in our society. Many researchers have created scenarios to predict or discuss alternative futures, e.g. Fidler, (1997); Alström et al, (2001) and Ihlström, (2004a). Surprisingly, such scenarios often portray young women travelling extensively and communicating through several different channels; they are interested in and almost dependent upon high-technologic inventions. Being a young woman in a similar situation myself, I have often been fascinated by such scenarios and the tendency of other researchers to portray someone different than themselves. I have likewise chosen to portray a person different from myself and use as my scenario a day in the life of a man in his forties. Any similarities with real persons or events are purely coincidental.

The introductory scenario is followed by a presentation of the aims and methods used when performing the studies for the three papers included in the thesis. The terminology used in the papers is explained in the section called Newspaper Publishing and Media Convergence. The findings of the papers are then compiled and followed by a summary. The Discussion and Conclusions and Reference sections precede the three papers.

## 1.1 Introductory Scenario 2005

Let's pretend you are in your early forties, living in one of the largest cities in Sweden. Imagine that you wake up every morning to the thumping sound of a newspaper hitting the floor in your hallway and the sound of disappearing footsteps outside the door of your apartment. You glance quickly at your alarm clock; it is 3:55. On the doormat lies your morning newspaper, which was printed and mastered just an hour ago by printers and technicians and contains the news collected, written and edited by journalists and editors that have worked all evening and night to make their final deadline.

Imagine that you, after having gone through the usual agonizing thoughts about getting older, go back to sleep. When the alarm clock sounds at 6:00, you rush out of bed, take a quick shower and stumble into the kitchen where your wife is already up and preparing breakfast. You turn on the radio and listen to the morning news at the same time as you scan through the sports section of your newspaper.

"This is old news", you think to yourself, since you read these words last night on the teletext before you went to bed. You then read the main section of the newspaper and enjoy the crisp sound the pages make as you turn them and then fold the newspaper to a more manageable size. The kitchen is quiet today; your kids are staying at your ex-wife's this week.

You listen to the news on the radio at the same time as you read about it in the newspaper. When you are finished with your breakfast, you toss the newspaper into the overfull recycle bin under the sink. Very irritated by the growing amount of waste paper under the sink, you wonder when you or your wife will remember to take those old newspapers down to the front

entrance of the apartment building. You forgot to do it last Wednesday when the recycle truck came. You sigh deeply, collect your lap-top computer, PDA, mp3-player, two mobile phones and headset, put on your jacket, check your vanishing and more-grey-than-brown hair one last time and leave for work.

A man gives you a copy of the free morning newspaper at the entrance of the subway station. He stands there every morning in his uniform and wishes the stressed men and women entering the station a good day. The sad smile on his face makes you feel guilty and you accept a copy of the paper from him, even though you consider the other editions of free newspapers available in the subway system much better. You read some of the less serious articles and the SMS-gossip column while on the train and then discover that you have reached your station. You hang your copy of the newspaper on one of the handles under the windows of the train and get off.

Now, picture yourself at the office, unpacking your gadgets in the conference room before the first meeting starts. You have arrived at work early, so you are alone in the conference room and decide to surf to one of the major evening newspaper's websites while waiting for the others to arrive. You watch a movie clip about the latest scandal involving a famous TV-star whom you have secretly had a crush on for years. As one of your colleagues enters the room, you quickly close the web reader and feeling a little ashamed of yourself, adjust the gadgets all lined up on your desk and start talking about the WAP functionalities of your PDA. He too unpacks all his gadgets (as is customary in these kinds of meetings) and shows you his favourite function of his 3G-phone as the other colleagues arrive at the meeting. You change slides with the aid of Bluetooth and your mobile phone during your presentation.

You are back on the website of the evening newspaper after lunch, this time wanting to read "100 Tricks to Get Slimmer in Just One Week", because you do not, sadly enough, conform to the ideals of today's society regarding how a human body should look. You are not as fit as you would like since you don't work-out, hardly ever cook at home, eat a lot of fast food and drink a little more than you should.

To your great disappointment, the web page with the slimming advice is not available unless you are a member of the site. This costs quite a bit and you would never consciously pay for digital information on the Internet, so you do a little work instead, feeling a bit letdown by the more common trend of walled-gardening.

You leave the office at the end of the day and head to the subway station. The news bill in the street shouts out the same news that you read on your computer during office hours. You walk with tired steps and, even though you have already read most of the news today, you decide to buy an evening newspaper just to pamper yourself a little. Sitting opposite you on the train is a young woman typing an SMS. You look at her and feel old. Not wanting her to notice your advancing age, you quickly pick up your mp3-player, turn up the volume and start playing a game on your brand new killer phone until you reach your station and get off.

You watch TV later that evening after dinner. You saved all your money last year to buy a complete home-cinema set-up and now that you have it, you finally feel good about yourself when you have friends over for dinner. After your wife has gone to bed, you check the sports results on the teletext. You then go to bed and dream about your favourite TV-star and sleep until you are again waken by the thumping sound in the hallway as the new morning newspaper hits the floor.

Finally, imagine that you don't like change very much and you don't like the quick passage of years, taking you closer and closer to retirement age, so if it were up to you, this is pretty much how things should continue.

Now, this was just an imaginary example; you do not really live your life like this. But you could, and if you did, this information would certainly be of interest to the media companies of the world. Companies that, perhaps for their own reasons, would like to re-shape your newspaper-reading habits and media consumption. The media companies' strategies, along with the new possibilities provided by technology, might change your way of consuming media in the future and thus affect and shape your views on the world. Now, however, these strategies have to be matched to the constraints of the existing production workflows inside the media companies as well as to the market conditions. Some of these strategies, production workflows and market conditions are discussed in this licentiate thesis.

## **2 Aims and Methods**

This chapter presents the aims of the thesis and describes how a certain set of methods was chosen to best suit the research questions of the thesis. The methods used are described in the Method section of this chapter, followed by a section explaining the methods used in each of the included papers. Furthermore, delimitations of the thesis and the chosen methods are discussed.

### **2.1 Aims**

This thesis aims to show that there are connections between convergence and multiple channel publishing. The main research questions have thus been:

- How is the newspaper industry handling the effects of convergence?
- What convergence strategies are there between newspapers and other media companies?
- How has the views on and strategies for publishing in multiple media changed when compared with the past?
- Why are the production workflows designed the way they are at the newspaper companies?
- How can the production and distribution of digital services at newspaper companies become more automated?

## 2.2 Qualitative Methods

Qualitative methods were chosen to explain the similarities, differences and challenges of the production workflow for multiple publishing channels at several different publishing companies. Furthermore, qualitative methods were selected to point out the specific trends, common strategies or successful moves and ventures unique to each publishing company since the companies are difficult to compare on a more general basis.

Among the characteristics of qualitative research is that the research takes place in the natural setting, employs multiple methods of data collection and a strategy of inquiry, and is based on the interpretations of the researcher. The qualitative methods used indicate that the findings are presented in a descriptive manner focusing on the occurring process as well as the product or outcome. (Creswell, 2003)

## 2.3 Case Studies

Yin (1994, p. 13) defines case studies in the following manner:

*A case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident.*

Yin (2004) suggests five research strategies: experiment, survey, archival analysis, history and case study. In Table 1, the five strategies are described depending on the type of research question, control over behavioural events and focus of contemporary events.

*Table 1: Relevant Situations for Different Research Strategies (Yin, 1994, p. 6).*

Strategy	Form of research question	Requires control over behavioural events?	Focuses on contemporary events?
Experiment	How, why	Yes	Yes
Survey	Who, what, where, how many, how much	No	Yes
Archival analysis	Who, what, where, how many, how much	No	Yes/no
History	How, why	No	No
Case study	How, why	No	Yes

Since the research questions for this thesis are mainly of the "how" and "why" type, the preferred methods to use (experiments, histories and case studies) are seen in Table 1. Moreover, the research questions focus mainly on a contemporary set of events over which the investigator has little control.

## **2.4 Futures Studies and Scenarios**

Scenarios and trend extrapolations are both methods of futures studies. The study of the future often involves the design of alternative futures (Schwarz et al, 1982). With the use of scenarios, alternative futures can to some extent be predicted. According to Schwarz et al, there was a movement at the early start of future studies against predicting the future based on past trends and against the usage of the so-called trend extrapolations. Trend extrapolations are nevertheless used to predict the future when forecasting a trend that is quantifiable and possible to extrapolate. Futures studies can, in contrast to trend extrapolations, be used to predict the events of larger complex problems.

Kahn and Wiener (1967, p. 6) describe scenarios as:

*Hypothetical sequences of events constructed for the purpose of focusing attention on causal processes and decision-points. They answer two kinds of questions: (1) Precisely how might some hypothetical situation come about, step by step? And (2) what alternatives exist, for each actor, at each step, for preventing, diverting, or facilitating the process?*

The use of scenarios was established in Sweden in the 1960's and was mostly used in mathematical research, political and defence planning. As preparation for constructing scenarios, experts make background studies of the problem area. Scenarios thus function as a way to communicate knowledge between experts and to synthesize it. (Schwarz et al, 1982)

## **2.5 The Difference Between Hypotheses, Models and Scenarios**

A hypothesis is a question with a presumed answer to be tested (Eriksson and Wiedersheim-Paul, 1997). It is usually defined as deviant from what is believed to be correct, since the test of the hypothesis is made to see if it can be falsified

A model is a representation of a phenomenon. A scientific model usually represents abstract hypothetical entities with postulated qualities described in a theory (NE, 2005). Since the model is intended to resemble phenomena in reality, constructing a scientific model is comparable to defining a theory. However, the model distinguishes itself from the theory by simplifying the reality, not by comprehensively explaining the reality. There are three main categories of models: theoretical models, logical

models and physical models. Furthermore, the models can be divided into static and dynamic models depending on the time aspects of the model, and micro or macro models depending on whether the model represents one object or a system of objects (Holme and Solvang, 1996).

A scenario is a systematic description of a hypothetical future situation or development. Scenarios are usually intended to describe a holistic view of connections from many disciplines (NE, 2005). The scenario is particularly suited for dealing with events taken together – integrating several aspects of a situation more or less simultaneously (Kahn and Wiener, 1967).

Table 2 shows some characteristics of the three formats of representation. Hypothesis describes an idea and does not have to be supported by theories until it is falsified. It differs from models and scenarios since it is an assumption of a specific problem where the researcher suggests the reason for or the solution to the problem. Models and scenarios do not directly offer reasons for or solutions to problems.

*Table 2: Characteristics of Three Formats of Representation.*

<b>Format of representation</b>	<b>Hypothesis</b>	<b>Model</b>	<b>Scenario</b>
<b>Based on</b>	Idea, assumption	Quantitative methods, empirical facts or logical assumptions	Qualitative assumptions with quantitative starting point
<b>Results in</b>	False or not false	Is accurate or not accurate, will work, will not work	Prediction of alternative futures, not interesting to falsify

The difference between a scenario and a model is that a scenario intends to display relations in a future hypothetical phenomenon, while a hypothetical model intends to simplify the reality to reflect it more generally. Furthermore, alternative scenarios usually accompany the scenario, while a model is used singularly.

## **2.6 Methods Used in the Included Papers**

The methods chosen for the included papers were qualitative methods, such as case studies including semi-structured interviews and observations. Scenarios and models were created based on these case studies in combination with literature studies.

Paper I is a theoretical study on the concept of convergence in media based on literature from the years 1979 until 2004. Different models have been studied in the paper; some were theoretical macro models, some static and some dynamic depending on the importance of the time factor. The chosen methods for Paper II and III have

been case studies. Paper II consists of multiple case studies of newspaper, television and broadcast companies and discusses a number of alternative ways for a newspaper company to work with moving images. Paper III is based on three embedded case studies where several levels of the organisation at each newspaper company have been studied. Furthermore, paper III presents a number of scenarios. Scenarios were selected because of their ability to show workflows that are not yet in use today. One of the scenarios presented was a surprise-free scenario (Kahn and Wiener, 1967) resembling the workflow of today.

Observations regarding current and future strategies for digital media content and payment services at newspaper companies have been made during discussions that took place in the Digital Media Council (RDM, Rådet för Digitala Medier) at the Swedish Newspaper Publishers' Association. I was secretary for RDM during my first two years as a PhD student and witnessing the discussions during the meetings has been a great source of inspiration for me when carrying out the studies for the included papers in the thesis.

Additionally, literature has been reviewed to find similar studies that answer the questions regarding the historical use of multiple channel publishing, the history of the studied companies and the origin of selected phenomenon occurring in relation to multiple media publishing.

## **2.7 Delimitations**

The findings of the thesis are based on studies of the newspaper industry in Sweden. The number of newspapers consumed in Sweden per 1000 inhabitants was 509 copies according to statistics from WAN in 2002 (TidningsUtgivarna, 2004) and placed Sweden in fourth place regarding newspaper consumption in the world. The Nordic European countries distinguish themselves from the rest of Europe since the tendency by companies to advertise in newspapers is 57.6% of the total investment made in advertisements in media a year, compared with 37.2% in all of Europe (TidningsUtgivarna, 2004). Because of the focus on the Swedish newspaper industry, the findings of thesis cannot be directly adapted to other parts of the world.

The findings of the thesis reflect on media companies and their strategies, production workflows and ventures during a specific time, namely 2002 to 2005. The case studies of media companies and their ventures into TV services as described in Paper II were test projects or plans for the future when the case studies were made. Today, two years later, the same media companies are turning these plans into reality. The constraints and advantages for the development of electronic paper have changed from the time when Paper III was written. Hence, the findings cannot be regarded as timeless and are reliable only when describing this specific period in time.

Technology and strategies behind the services offered by the media companies are among others issues such as economical, legal or behavioural, driving forces for

changes in the journalistic aspects of the content. The approach of the thesis has not been from a journalistic, design-oriented or legal point of view. However, it is the author's opinion that it is important to study topics such as selection, archiving and refinement of news depending on its value, changes in content depending on the publishing channel, design-issues, digital rights management and terms regarding economical compensation for multiple channel reporters and journalists. It is also important for researchers to study if there is a change in the content due to which publishing channel that is used from a long-term perspective since this content is what will eventually reach the audience, affect them and perhaps change society.

It is not within the scope of the thesis to develop or implement technological solutions. However, some technological guidelines are presented to enable publishing in the different studied publishing channels.

## **2.8 Method Review**

According to Creswel (2003), qualitative research is characterized as interpretative research, thus making it impossible to ignore personal interpretation brought to analysis of data. The role of the researcher is therefore important to consider in relation to the results.

It is the author's opinion that there are special relationships between researchers, technology developers, newspaper companies and real users. Views on news services and technology differ depending on one's role and the opinions of others are often misinterpreted, which leads to misunderstandings. Hansson (2003) discusses science as a means of making the different perspectives come together as one common perspective. The role of the researcher should therefore be to reflect a perspective that is inter-subjective and common for everyone. A precondition for this is that the researcher is as objective as possible and does not reflect a common prejudice or belief for a certain process or phenomenon.

The case studies were based on qualitative research, such as empirical observations, semi-structured interviews and making the general validity (Eriksson and Wiedersheim-Paul, 1997) a weakness of the results. Holme and Solvang (1997) suggest that reliability and validity is best secured by reciprocal actions between researcher and the interviewed objects in a study. The persons interviewed in the included papers have to some extent been contacted for follow-up interviews or to review the findings of their interviews, thus creating a reciprocal action between the researcher and the interviewed objects.

Using qualitative methods implies that the validity will be high for the collected information as the researcher is close to the studied objects. However, the closeness of the researcher to the object could affect the findings by indicating connections or suggesting solutions that those interviewed would not have thought of themselves. The reliability of the findings in qualitative research is of less importance, since it is almost

impossible to re-achieve the same social settings for the case studies performed. (Holme and Solvang, 1997)

The use of future study methods such as scenarios can give rise to many doubts about the conclusions made in this thesis. Is it possible to predict what will happen in the future? As stated by Schwarz et al (1982) the future is uncertain because the future itself will evolve as a result of decisions not yet made. In this statement lies strength. Since the future is dependent on the decisions we make, we can influence the future by our decisions. Designing scenarios of the future thus delimits the uncertainty, which we want to take into account when studying the problem at hand (Schwarz et al, 1982).

### **3 Newspaper Publishing and Media Convergence**

This chapter provides background on the newspaper industry and introduces terminology and definitions that are used in the included papers such as media, the newspaper industry and multiple channel publishing. A value chain of a newspaper company is presented and the sections that follow discuss newspaper content production workflow and are based on the four stages in this value chain: creation, packaging, distribution and consumption.

The latter part of the chapter discusses a few strategy trends and influences caused by hype within the newspaper industry. Lastly, the results from the included papers are discussed in order to present the background of the terminology in the included papers. These same results are further discussed in the Discussion and Result section of the thesis.

#### **3.1 The Newspaper Industry and the Media**

Newspapers are one of many mediators of information and entertainment. They have traditionally been printed on paper, but today's digital technology makes it possible to provide newspapers through a number of different channels.

Traditionally, media, and mass media in particular have been defined as the production and distribution of information on a one-to-many basis (Europe Economics, 2002). Including not only mass media in the definition, media can be described as channels acting as intermediary for information and entertainment (NE, 2005).

However, what can be included in the definition of media changes over time. Recently, defining e.g. media technology includes the technology and methods supporting human communication across space and time (Enlund, 2003). According to

Hedman et al (2005), the traditional concept of mass media has been replaced by the concept of media. The concept of new media consists of communication technologies and the traditional media channels have been modified to also support two-way communication. Thus, communication processes are of central importance when describing media today.

### **3.2 Revenues and Ownership**

The main income for newspapers is from advertising. Since the cost to advertise in the printed edition of a newspaper is high compared with the other media channels, the printed edition is the major source of income for the newspaper companies. Thus, according to the papers included in this thesis, regardless of the number of new publishing channels introduced into a newspaper organisation, the newspaper companies still view the printed edition as their primary product. However, this focus on the printed edition may change over time.

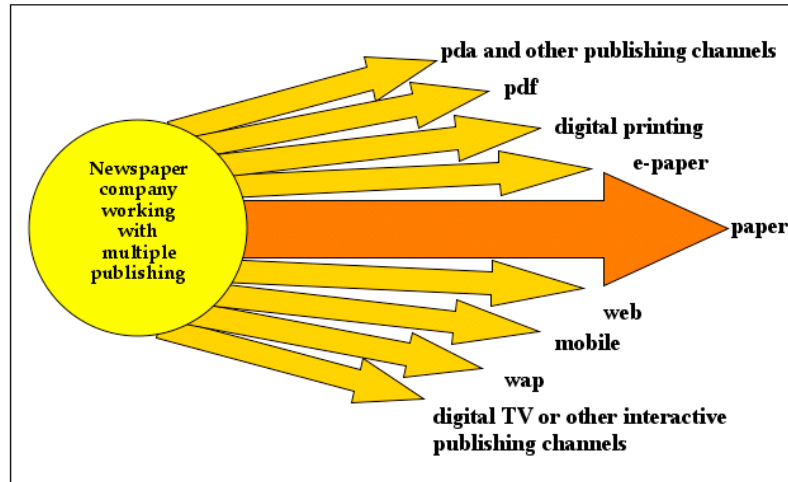
Media companies in Europe and North America and publishers in particular, have historically been family-owned small and medium-sized enterprises (Picard, 2004). However, according to Gershon and Suri (2004), the 1990s will be remembered for rapid growth characterized by major mergers and leveraged buyouts. The entire structure of media companies has changed thanks to mergers, developments in technology and new ways of cooperation. Today, a media company focusing primarily on a certain type of publishing channel, such as a newspaper organisation, is often owned by a larger media organisation, as is the case in the USA where many newspapers are owned by dominating newspaper chains (Hadenius and Weibull, 1999) with several divisions operating in more than one media industry (Meier and Trappel, 2001). The traditional model of a media company still exists, however, it has become common among large media conglomerates that what were once competing organisations are now brought under the same roof (Ifra, 2002) with several media publishing channels present in the organisation.

### **3.3 Multiple Channel Publishing at Newspaper Companies**

Figure 1 illustrates how a multiple channel publishing newspaper company today can produce content for many different publishing channels.

Enlund (1979) discussed the workflow structure for creation of content at a multiple channel publishing newspaper company already in 1979. He pictured the newspaper as an information center and referred to an information bank for storage of content to be published. By using such an information bank or central database and a central news desk for the integration of the packaging and production processes of the content for the different publishing channels, the newspaper companies have come closer to using the same production workflow for publishing in all channels. Quinn (2002) presents a

number of newspaper and media companies worldwide that were pioneers in working with such multiple channel publishing, i.e., the Tribune Company (USA), the Tampa Tribune (USA) the Turun Sanomat (FI) and the Ming Pao Newspapers (CH) to name a few.



*Figure 1: Different publishing channels as multiple channel publishing at a newspaper company (Paper II).*

With the aid of a central database for information management in multiple channel publishing, Quinn claimed that XML (eXtensive Markup Language) was the main tool available to put convergence journalism into practise. Three years later, XML is widely used by newspaper companies and the development of standards and dialects of XML for newspaper publishing such as AdsML and NewsML have been made possible (Pascual, 2005).

The investigated newspapers all work with multiple channel publishing. However, they have not fully adopted the strategy of publishing for several channels without focusing on one primary publishing channel.

The advertisement workflows at the investigated newspapers are today only partly integrated with the editorial workflows. Additionally, the production workflow for the on-line edition is generally separated from the workflow of the printed edition. Thus, there is additional work to be done before a general workflow can be established for all publishing channels.

### 3.4 The Value Chain from Creation to Consumption of Content in Media Production

The process from creation to consumption of content can be described as a generalized media production value chain (Figure 2). This value chain represents the course of events from the production of content to its consumption in relation to the processes of convergence and technology development. Value chains for content in media production have previously been described by for example Stenberg (1994) and Rosenqvist (1999), but without the relationship to convergence processes in combination with technology development.

The stages in this value chain are connected to the technology in terms of production, packaging, distribution systems, networks and devices.

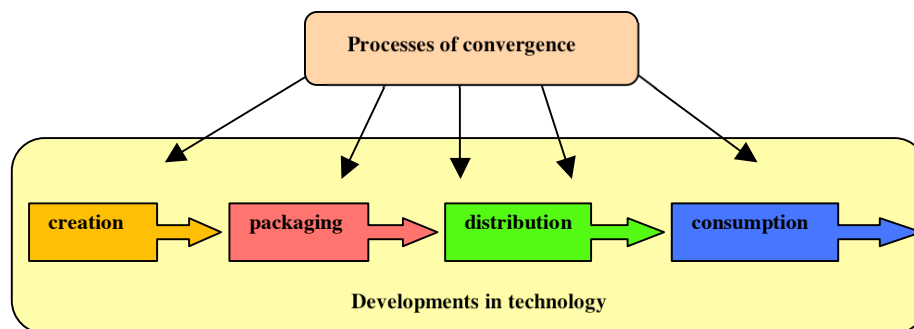


Figure 2: The value chain from creation to consumption of content in media production (Paper I).

The purely journalistic aspects of content creation, design and planning will not be described in the following chapters that detail the value chain since this value chain describes technological actions in the workflow.

The first stage, creation of content, is the phase where product planning takes place and the material enters the production system. Text content is typed, images and advertisements are refined, and elements such as sound clips, moving images and other digital input are collected and stored in the database of the newspaper company. The second stage is the packaging phase and is the process where material stored in the database is edited, laid out, packaged and finalized for publishing. In the third stage, the content is either digitally launched or printed and further distributed. The fourth and final stage is where the product reaches the audience and is consumed.

The value chain in Figure 2 may describe the publishing workflow of a multiple channel media company where convergence processes can be present in all stages of the value chain. In the creation stage, processes of convergence could involve reporters producing content for multiple publishing channels. Convergence in the

packaging stages could imply that content produced in a channel-neutral format is packaged differently for a number of different publishing channels. Convergence processes in the distribution of content could denote the use of alternative distribution networks traditionally used for distribution of specific content such as distribution of text files over the digital audio network or the digital video network. The consumption stage could involve convergence processes if the audience decides to download content into one device, such as reading news on a PDA (Personal Digital Assistant) or collecting summaries from their favourite websites via RSS (Rich Site Summary).

A limitation of this value chain is the absence of interaction between the readers and the players in the chain. Interaction can be present in all stages of the value chain depending on the service. In the creation stage, interactivity could involve content from readers such as letters, article comments or chat forums on the on-line edition. Interactivity in the packaging stage could involve customized printing and zoning of content or advertisements both in the printed edition and the on-line editions. Interactivity at the distribution stage could involve different forms of personalization and in the consumption stage imply the choices made by the audience in terms of what content to consume and when to consume it. Furthermore, commenting in chat-forums or on articles in the newspaper can also take place as an interactive event in the consumption stage.

### **3.5 The Production Workflow at Newspaper Companies and the Creation of Content**

A workflow in this thesis is mainly used to denote the flow of material in the newspaper company's publishing system. The structure of the production workflow varies between the companies, depending much on the size of the newspaper and its available resources, software systems and number of output channels.

There are two extremes of workflow types at the first stage as seen in Figure 2: the integrated multiple channel workflow, also referred to as cross media content delivery workflow (Ifra, 2003), and the separated multiple channel workflow, where the printed and the electronic editions are produced in totally separate organizations, also referred to as single workflow (Ifra, 2003). In the integrated workflow, content is produced without a specific target channel. The material is stored in a neutral format and can be used in any publishing channel after packaging the content. In the separated workflow, the different editions do not cooperate or share content; the on-line and the printed edition departments are clearly separated.

Many newspaper companies have tried or are trying to use a central news desk for all media channels in the editorial department. Representatives from the editorial sections of both the on-line and printed departments work together to produce all the different editions of the newspaper. The central news desk concept is currently being tested at

the Newsplex facilities in South Carolina, USA and at large newspapers around the world (Quinn, 2002, Ifra, 2004).

Figure 3 describes a general newspaper workflow for today's printed edition. The workflow starts with the planning process, where the number of pages and the general layout is decided. Advertisements are booked before entering the production system and placed in a pre-archive. The advertising department collects the different advertisements from the pre-archive and they are automatically controlled according to the advertisement constraints at the particular newspaper company before being stored in the advertisement database.

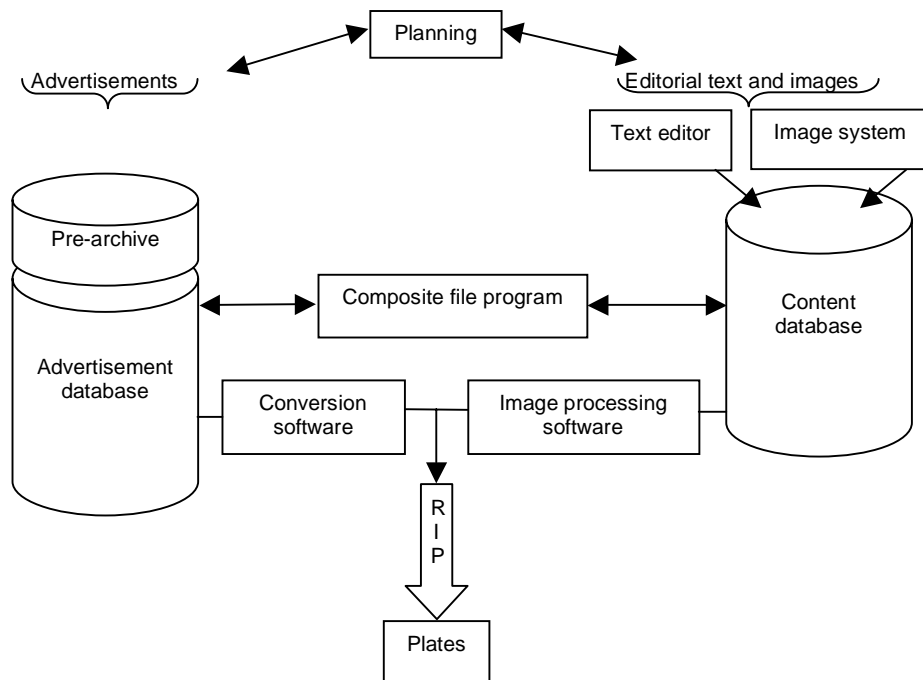


Figure 3: The general flow of material at a newspaper.

Editorial content is imported into the publishing system of the newspaper via text editors or automatic feeds and stored in the content database. Images are usually refined in an image system before storage. The advertisements are then placed onto the pages of the newspaper in composite file format and exported to the editorial department where editorial content is placed onto the pages. The finished pages are controlled and converted with the aid of various software programs and rasterized before the plates are made at the printing plant. The newspaper pages can either have been directly transferred to the servers after they have been finalized for rasterization or rasterized before the transfer to the servers. After the pages are transferred, the

printing plant, mailroom and distributors of the printed copy have responsibility for the rest of the workflow of the newspaper production.

Figure 3 describes the creation stage and the packaging stage as seen in Figure 2 and solely describes the workflow for the printed edition. The planning of the digital edition is not the same as the planning of the printed edition as advertisement size and quantity does not vary in the same way. Even though content can be produced in a similar or identical way, much material is re-used from the already-printed material at some newspaper companies. The flow of material for the digital editions is discussed further in the next section.

Many newspaper companies work today with multiple channel publishing and experiment with central news desks and different convergence strategies between the publishing channels. However, the organizational structures production workflows remain mostly traditional and are not always adaptable to new publishing channels and alternative ways of working with production of content.

### **3.6 The Digital On-Line Workflow and the Packaging of Content**

The packaging stage as seen in Figure 2 is described as the finishing of the product. For printed content, it would include the processes from when the newspaper page is ready for print, is transported to the printing plant and printed.

The boundaries of packaging are not as clear for digital media as they are for printed media. In 1999, Södergård et al claimed that publishing on the web is mainly a translation of traditional media. From the interviews carried out six years later for the included papers, this statement still holds true with some alterations, as can be seen in Figure 4. The figure illustrates a general workflow for an on-line edition at a newspaper company, based on the workflows at the studied newspapers of this thesis.

The flow of materials in Figure 4 starts with the import of content from both the printed edition and from external sources, as well as with the creation of unique material. This unique material can later be used in the printed edition, but is usually followed by more in-depth analysis compared with the content published in the on-line edition.

Advertisements can be created by the on-line department, but are largely imported or linked to external sources, such as national retailers of advertisements.

Content is stored in the database of the on-line department, edited, administrated and published on the web site of the on-line edition.

The on-line edition staff members usually moderate interactive services, such as chat forums, to prevent the publishing of unwanted statements. Furthermore, in most cases, archive and search engines are provided on the website of the on-line edition at the studied newspaper companies.

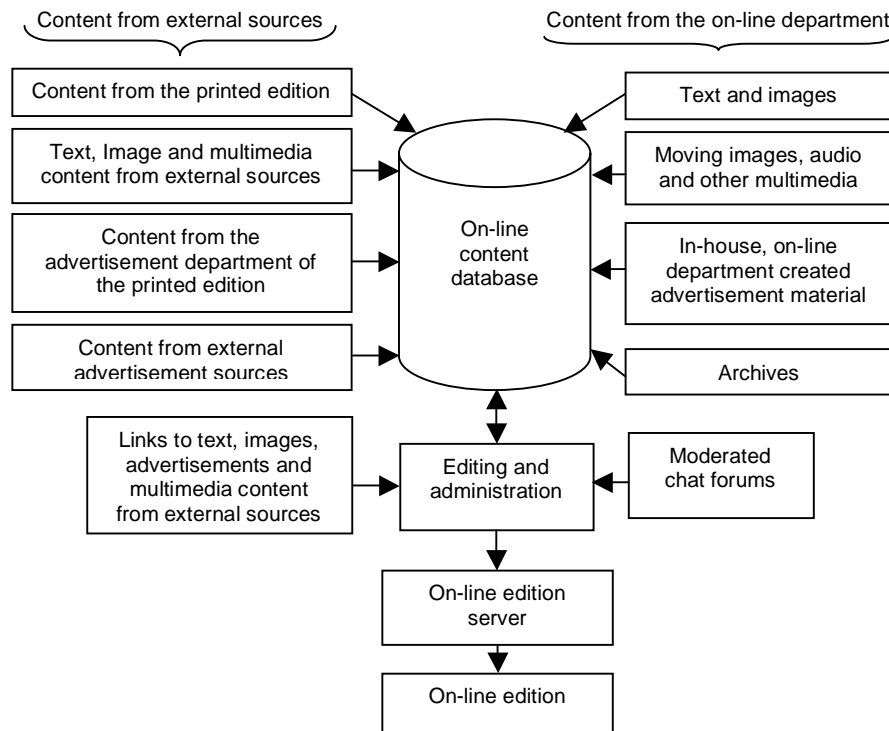


Figure 4: The generalized flow of materials for the on-line edition at a newspaper company where the printed edition is the primary edition.

At the studied newspaper companies, the on-line department is also responsible for packaging content for digital publishing channels other than the on-line edition. Examples are editions for PDAs, mobile phones or digital TV text services. The content in these cases is generally a shortened version of the on-line edition, or as in the case of the WAP edition, headlines in combination with a short description of the news.

The simplest digital publishing channels are managed more or less automatically using meta-tagged content from the database of the on-line department or from external sources. Additional resources are needed to handle layout and proof reading of content for more complex publishing channels than those consisting of text-based SMS-news or news for PDAs before it is published and distributed.

### **3.7 Distribution**

In the value chain seen in Figure 2, the third stage represents the distribution of media content, which can take place either physically or digitally. Physical distribution of newspapers involves the printing process and mailroom activities, as well as the carrier districts, truck routes and loading (Rehn, 2001).

Physical distribution of the printed edition to the readers' homes is costly for the newspaper companies. Digital distribution and digital newsprint is faster and more cost efficient compared with the physical distribution of the newspaper.

The process of delivering a physical copy of the newspaper to a subscriber is a controlled and well-known process (Ifra, 2003). In the digital world, newspaper companies have struggled to find quality solutions for electronic payment of the digital content. Furthermore, copyright issues imply that newspapers are sometimes forced to exclude certain parts from the digital editions that were previously published in the printed edition, such as the comic section of the newspaper.

Convergence of networks (European Commission, 1997) has made it possible to distribute digital content over many different networks that were previously not used to transfer several types of information. The combination of networks increases the reach so that the same information can be distributed to as many readers as possible.

### **3.8 Consumption - Target Groups for Media Content Products and Technology**

The last stage in the value chain as seen in Figure 2 is the consumption of the content. The consumers or readers of newspapers have traditionally been considered as those reading the printed edition. Today, as newspapers produce editions for a number of publishing channels, newspaper readers might not always be readers of the printed edition. As suggested by Ihlström (2004b), national newspapers have gained a new type of audience, non-readers of the printed edition. Hedman et al (2005), argue that there is a segmentation of the audience between different publishing channels and media. The audience has, according to these researchers, limited time and money to spend on media consumption and neither can nor wants to increase their consumption as new media channels emerge.

According to statistics from the Swedish Newspaper Publishers' Association (2004), 88% of the Swedish population between the ages of 15 and 79 spend about 25 minutes every weekday reading a printed newspaper from the 4,1 million copies a day that constitute the Swedish newspaper circulation. Sweden is in first place in Europe in Internet usage, with 57% of the population using the Internet (SCB, 2004). There were 106 Swedish on-line editions of newspapers in 2003. However, only 9% of the part of the population that used the Internet in 2003 read an on-line edition of a newspaper

every day. 32% of the population that used the Internet in 2003 had never read an on-line edition of a newspaper (TidningsUtgivarna, 2004).

These statistics can be compared with statistics from 1985, when 84% of the population read at least one morning newspaper every day with an average time of 31 minutes per day. In 1998, the same type of statistics showed that 83% read at least one newspaper every day and the average time spent reading the newspaper was 30 minutes. In 1998, the 41% of the population that used the Internet had read the on-line edition of *Aftonbladet*, the largest Swedish evening newspaper and the largest on-line newspaper in Sweden. (Carlsson, 1999)

Comparing the statistics from 1998 and 1985 with the statistics from 2003 would thus imply that the consumption of newspapers has decreased regarding the time spent reading a newspaper. However, the number of people that read at least one newspaper everyday has increased. This change can be due to newspapers with fewer pages and/or the introduction of free newspapers, to name only a couple of factors that can influence the statistics. Nevertheless, media consumption has changed since 1985.

The terms daily media reach and media market shares are important when considering consumption of media. The daily media reach of publishing channels including Swedish newspapers in 2003 is summarized in Figure 5 and is based on statistics from Nordicom-Sveriges Mediebarometer (2003). Everyday, 87% of the Swedish population watches TV compared with the 81% that read a newspaper, including the free newspapers.

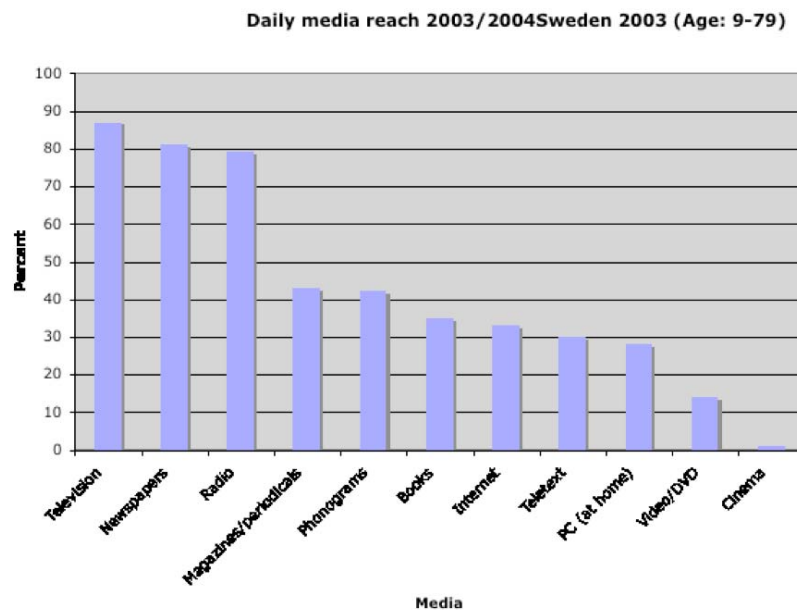


Figure 5: Media reach in Sweden in 2003, population aged 9-79 (Nordicom, 2003).

Media reach depends largely on what kind of technology the consumers have in their homes and workplace. According to an investigation by the company Intel, 40% of European homes have at least five different remote controls (Microsoft, 2005). Such studies are used by companies like Microsoft as evidence that there is a need for converged solutions in multi-media devices in future digital homes.

Media market shares on an average day in 2003 in terms of time spent consuming media can be seen in Figure 6. Radio and television hold the strongest positions in Sweden.

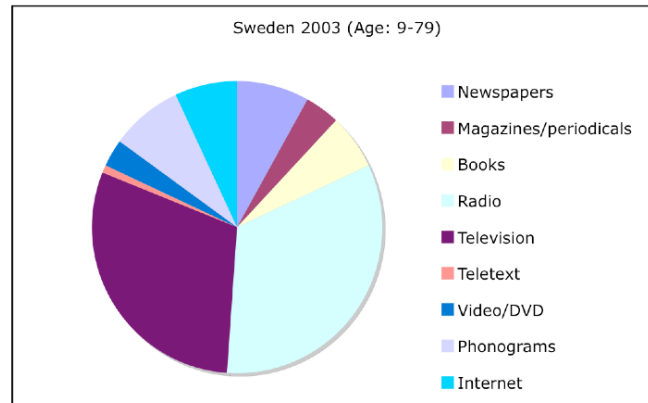


Figure 6: The media market shares on an average day, based on statistics from Nordicom (2003).

Today, as circulation decreases and young target groups, according to the studied newspapers, demand new ways to read the news, efforts have been made at the newspaper companies to fulfil the needs of their audience in order to keep them as readers and subscribers and thereby entice advertisers to stay with their company. This is not an easy task, however, as youth in the Nordic countries, according to Kairos Future (2004), are professional consumers and will not be easily impressed by the range of products and services aimed at them on the market. They know they constitute an attractive target group, hence, they are not easy to attract. Young Nordic people are said to be individualists, demanding the right and possibility to shape their lives as they wish and to make their own decisions. (Kairos Future, 2004)

While attracting young readers is certainly important, it might be among the older target groups that there are possibilities to make money. Stafford (2003) argues that the target group consisting of early adopters of computer technology tends to be older, has higher incomes, is more educated and has higher socio-economic status. Statistics from 2004 show that computer usage in households with people over 60 years old has increased 6% from 2003 to 2004 (PTS, 2004). 97% of 31-40 year olds use a mobile phone, as do 96% of 41-50 year olds. Among people aged 31-40, 26% send between two and five SMSs a week, which is the same as the number of persons in the target

group aged between 16 and 20 send in a week. 79% of the 31-40 year olds use content services such as games, chat functions, ring tones or MMSs in their mobile phones and 71% of the 41-50 year olds use these same mobile phone content services. (PTS, 2004)

### **3.9 The Newspaper Industry – Technology, Strategies and Hype**

The processes of convergence and developments in technology are affecting the value chain from creation to consumption of content. Sources of revenues for the newspaper companies, the desire to invest in or to buy the product from the newspapers' customers and the competition between the different media content production companies all affect the decision-making process when venturing into new media channels. Strategies for investment in technology and what convergence processes to adopt for future newspaper publishing are among the many factors that rely on a number of economic issues.

Newspaper companies have several types of customers contributing to their revenues. The two major sources of revenue for media companies are advertising and consumer/end-user spending (Blackman, 2004, Stenberg 1994). The consumer/end-user customers are readers buying the product as subscribers or single-copy buyers (Stenberg, 1994). The advertising customers buy space for their advertisements in the product (Stenberg, 1994). Other contributors are hardware companies or network operators that contribute by financing services offered by the newspaper companies. In this manner, they hope to increase usage of their devices by offering their customers newspaper content services included in the devices (Ifra, 2002). Moreover, cross promotion cooperation with other media companies contributes to income, mainly through revenue sharing (Ifra, 2002).

Retailers of information, such as content aggregators repackaging the content for their own products, usually do not pay for the content. Nevertheless, they use it and profit from it. Google News ([news.google.com](http://news.google.com)) relies on editorial judgement of online news organizations. Furthermore, RSS-feed based news services such as Swedish Nyhetsportalen ([www.nyhetsportalen.se](http://www.nyhetsportalen.se)) are also collecting news from the newspapers' on-line editions without paying for the content.

Innovations in information and communication technology (ICT) continue, leading to new services in areas such as broadband networks, third generation mobile systems, peer-to-peer communications, digital compression technologies and content management systems. These innovations all have an impact on shaping the media sector. (Blackman, 2004) Thus, the challenges for today's newspaper organisation are many. Note, however, that they are referred to as "challenges", not problems. Jonasson (2005:12) takes it one step further, describing these challenges as opportunities, not threats.

It has become important on the media market for newspaper companies to attract readers and advertisers by, for example, profiling themselves as leading edge or far

ahead of others in new technology. Moreover, during the years of the Internet-boom, buzzwords were used extensively and not only to promote new technologies and start-up companies (Uppgård et al, 2003). In this context, it became, and still is, almost obligatory to illustrate new ventures with the aid of the concept and, according to Uppgård (2003), the buzzword convergence. Hence, convergence in media is a highly adopted concept in the future strategies of newspaper companies. The concept often appears in literature in same context as other so-called buzzword concepts. Some examples of such buzzwords are cross-media publishing, fusion, mediamorphosis, and most recently, the Triple Play concept, which refers to the involvement of telephony, Internet and television (Zhao, 2003) or, in other words, voice and video mixed with data (Jorgenson, 2005). Other related concepts often discussed in the context of convergence are confluence, cooptation, integration, diffusion and mergers, to name but a few. Furthermore, metaphors have been used to often denote convergence processes along the themes of highways and marriage, such as travelling together on the same information super-highway (Briggs and Burke, 2002), or a marriage of technology and content delivery (Lawson-Borders, 2003).

The term convergence has been used when introducing new features such as elements of interactivity, niche content and personalization in digital editions, particularly on the on-line editions of the newspaper companies. Hedman (1999) claims that newspaper companies have initially failed to develop a comprehensive strategy for their ventures into new services in the electronic market. He suggests that newspapers have entered the electronic market for the same reasons that they entered the television and radio markets: to defend themselves against possible advertising competition.

According to a survey among newspaper companies in Sweden in 1997, the main reasons for newspapers to enter digital publishing were to reach a potential future market, increase the number of readers and reach young readers. In 1999, several of these newspaper companies had, according to Hedman, adopted strategies for their on-line publishing, such as:

- developing niche-content areas
- integrating the printed edition with the electronic edition
- cooperating with several newspaper companies publishing on one common website
- re-using already published material in several media channels
- creating digital marketplaces or portals for the local market

Since consumers can access news faster with the aid of Internet than journalists can publish the content, Quinn (2002) discusses how information overload can encourage newspaper specialization. He claims that consumers are demanding more relevance and that advertisers are targeting better. Furthermore, media companies have previously believed that editorial content was their crown jewel, however according to Quinn (2002), they have now found that editorial content is not enough. Services, features and e-commerce elements have been added to the editorial content, making the media companies function more as guides than gatekeepers.

As newspapers under the threat of growing competition are trying to see their problems as challenges, drive towards specialization and add new features to their existing products, it is probable that the newspaper companies will have to revise or develop their strategies to maintain their market positions.

## 4 Summary of the Included Papers

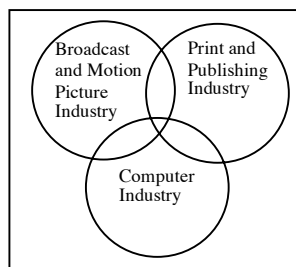
The three included papers are summarized in this chapter, starting with the first paper, which gives a view on how the concept of media convergence has been used in the literature and applied to processes in newspaper production. The second paper discusses digital- and web TV from the perspective of the newspaper companies and the third paper maps the field of electronic paper for future newspaper publishing.

### 4.1 Paper I: Convergence and Divergence in Media – Different Perspectives

The aim of the paper is to find what general definitions there are on the concept of convergence in media and the paper serves as a review of the existing models for media convergence from the early 1970's to 2004. No standard definition of the concept existed at the time this paper was written, however, numerous attempts at a single definition were found.

The concept of convergence is used in a number of academic fields with the meaning varying between the disciplines. One example of a definition of convergence from a discipline other than media is the biological definition. For a biologist, convergence signifies how similar biological structures have been developing from separate sources of origin. These convergence processes are never completed; the organism's original heritage is always preserved in some form.

In media research, MIT researcher, Nicholas Negroponte was one of the early introducers of the concept of convergence.

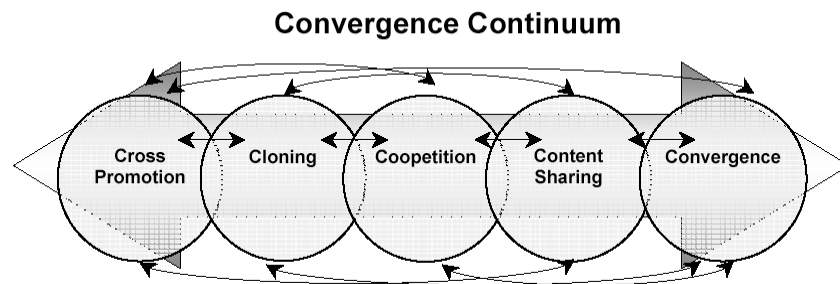


*Figure 7: Negroponte's circles describing the MIT Media Lab's construct of convergence (Fidler, 1997).*

He presented a convergence model based on three intersecting circles representing three media industries coming together (Figure 7).

Convergence was considered the driving force behind developments in telecommunications, media and information technologies in the 1990s. The European Union presented their view on convergence in 1997, and in 2001, the Swedish Government Commission suggested that convergence consisted of four areas: services, electronic appliances, networks and market convergence (SOU 1999:55, 1999).

Newsroom convergence is yet another convergence area. The convergence in the newsroom deals with media content production and has been explored at the Newsplex facilities in the USA (Quinn, 2002). Convergence in content production involves processes taking place within editorial departments, in editorial system technologies and for the professional role of the reporters. One example of a model of newsroom convergence can be seen in Figure 8 and was published in the summer of 2003.



*Figure 8: The convergence continuum (Dailey et al, 2003).*

The paper refers to the confusion in defining convergence since the concept is applied to several different contexts. In addition to the academic models, several non-academic convergence models flourish, usually defining convergence of devices.

Alongside convergence are the processes of divergence. The concept can be seen as contradictory to convergence, but can also appear simultaneously depending on the reference frame. The paper describes how Enlund and Lindskog (2000) explain how the widening range of information created by services containing interactive elements or services focusing on niche publishing from a consumer perspective encourages divergence. However, from a technology perspective that does not include the content, the technology, services and production workflow behind the content are converging.

Technology developers can influence whether a device, service or usage trend will be influenced by processes of convergence or by divergence. The paper suggests that the electronic newspaper can be one of the devices possible to influence.

Media convergence during the 1990s mainly concerned networks and services in data, broadcasting and telecom industries. At the beginning of the 21<sup>st</sup> century, convergence was mainly described as several more or less interacting processes occurring in different fields. Recently, convergence has mainly been regarded as a niche concept to describe developments of new technology with different connotations and meanings depending on which niche it is describing.

The paper concludes that media convergence is an ongoing process often appearing together with its opposite, divergence. Furthermore, divergence can appear as a result of convergence. The effects of convergence are visible, measurable and possible to detect, while the actual process might not be. The paper suggests that it might be more interesting to study the effects of convergence rather than the process itself. The results of the processes of convergence shape the media companies, change their products and thus affect our society and us.

#### **4.2 Paper II: Evaluating Digital TV as a Publishing Channel for Newspapers**

Web TV and Digital TV (DTV) are presented in the second paper as two examples of convergence of technology, services and content based on a study carried out during 2002. The aim of the paper is to give a wide perspective of the DTV and web TV markets focusing on the advantages moving images could offer to a newspaper company.

The paper suggests that the competition for the newspaper companies has become tougher not only as newspapers, but now also as other types of media channels compete in the same field. For the morning newspapers that compete primarily with the evening newspapers, venturing into a service broadcast over the DTV net or over the Internet could offer new possibilities. The morning newspapers could combine text with moving images, audio and live broadcasts, reach an audience larger than their current subscribers and offer the same entertainment value as that published in the evening newspapers. Furthermore, DTV and web TV could enable interactive possibilities by making two-way communication with the audience possible.

The two main moving image types discussed in the paper are broadcast television and web TV. The three major forms of broadcast TV in Sweden discussed in the paper are Digital Terrestrial Television, Digital Cable Television and Digital Satellite Television. As seen from the consumers' point of view, the choice of broadcasting form is not only a technical issue but also one concerning residential areas and availability of TV channels.

In the paper, three TV companies were studied and their strategies regarding DTV are discussed as follows:

Strategies involve strengthening brands through cross-promotion and cooperation with technology providers, which lowers the costs for ventures into new services. Additionally, three newspaper companies experienced in working with moving images were interviewed. The newspaper companies' main aim with the moving image ventures was to retain their news publishing position in the future with the aid of this type of multiple channel publishing. The moving image services offered by the newspapers are often regarded as test-projects and it has therefore been necessary to keep expenses low.

The return channel for DTV is not always provided through the broadcasting net and some of the interviewed TV companies or newspapers have tried to encourage the audience to interact with the services via SMS. Different devices were then used in combination to create interactivity. Some of the interviewed TV companies and newspapers have successfully tried to cooperate with other partners regarding niche services such as business news or home furnishing.

A number of operators of digital TV broadcasting nets were also interviewed in the study. Their main reason to convert to DTV was to cut distribution costs when broadcasting digitally. Many of the operators control the value chain from distribution to the customer, thus maintaining contact with the customers.

Since there is no distribution net currently available in Sweden that covers the entire country, TV companies are forced to broadcast over several distribution nets. Furthermore, the telecommunication and broadcasting companies have developed proprietary platforms for interactive services making it necessary for the companies to program their interactive DTV services in several formats depending on the distributor. The interactive services can be divided into local and central interactivity. Local interactivity implies that the entire service is downloaded into the viewer's set-top box and no data is returned after the downloading process is completed. Central interactivity means that the operator of the distribution net receives information back from the viewer. A central interactive service is True Video On Demand. This expensive form of interactivity means a unique two-way communication between the operator and the viewer and is commonly substituted for Near Video On Demand. However, Near Video On Demand implies that programs and services are broadcast to all the viewers even though only those who are supposed to get the information can decrypt the broadcast data in their set-top-boxes.

This paper concludes that the text format in the TV medium is ideal for newspapers. The paper suggests that newspapers could either work with web TV or text-based TV services. One way to start is to adapt the existing content to the TV medium and establish a relationship with existing TV companies to acquire further knowledge. A newspaper company could for example cooperate directly with the operators, creating text-based services such as an EPG (Electronic Program Guide) or other portal services. Other suggestions are made, however, they are more costly for a newspaper company. It could therefore be preferable to cooperate with existing actors on the

market when entering the area of moving images in order to gain knowledge for future ventures.

### **4.3 Paper III: E-paper Production Workflow – Adapting Production Workflow Processes for Digital Newsprint**

The third paper describes electronic paper (e-paper) as one example of a publishing channel in the paper denoted as digital newsprint. The paper is based on case studies of three mid-sized regional Swedish newspapers with previous experience working with PDF editions and focuses on e-paper services as extensions of printed editions. Based on the case studies, three production workflow scenarios for working with electronic paper at newspaper companies were suggested.

The definitions of e-paper and its services introduced in the paper are defined from the perspective of the newspaper companies. Digital newsprint is defined as a form of digital distribution of content originally based on the content for the printed edition. There are e-paper devices or terminals and there are e-paper services. When the term e-paper is used without a qualifier, it is defined as the entire field of e-paper, including both devices and services. The services for e-paper can be seen as a crossbreed between the traditional paper edition and the on-line edition.

E-paper is intended for reading in a similar manner as reading on traditional paper, but with the possibility for updates and interactivity. The terminals are designed to be portable and to consume a minimum of electrical power. The display of the terminals generally consists of a screen with electronic ink wrapped in a covering shell. The electronic ink in an e-paper device consists of a grid with tiny cells, forming pixels on a display. These cells contain charged particles that are affected by the electric field caused by printed plastic electronic circuits in the backplane of the e-paper terminal. Depending on the manufacturer or solution, the cells can contain charged coloured particles or oil and water in combination with a coloured backplane or filters.

The first prototypes of e-paper devices were small, no larger than an A5 page and with few or non-existent interactive possibilities. According to market research made by e-paper manufacturer Philips and Swedish morning newspaper *Sydsvenska Dagbladet* in 2003, users regarded such e-paper terminals as another gadget with nothing new to offer. Since the technologies for e-paper were under development, technological solutions such as what distribution forms to use were still possible to influence. A combination of distribution forms were suggested for updating the terminal, such as IP (Internet Protocol), 3G (Third Generation mobile telephone technology), DAB (Digital Audio Broadcasting) or DVB (Digital Video Broadcasting). (Liljestrand, 2003)

According to the case studies, newspaper companies working with multiple channel publishing aim to produce content for the different publishing channels as automated as possible. This is important to cut costs and the three studied newspapers have

presented somewhat different strategies concerning how they will work with the e-paper product. These strategies involve creating an e-paper product identical to the printed edition, tailoring the material specifically for the product or using it as an extension of the on-line edition.

The three scenarios presented in the paper are based on state-of-the-art editorial technology and organizational structure at the newspaper companies. The organizational production workflows at the studied companies are somewhere between a separated and an integrated workflow, since the electronic edition is partly separated from the primary product, the printed edition of the newspaper.

Aspects to consider when modelling an e-paper workflow is that there are two main content-producing departments at the newspaper company: the editorial department and the advertisement department. Many pages contain elements produced by both departments. In general, the layout is decided by the advertisement department, stored as one unit and assembled by the editorial department as if the advertisements were images.

Since an e-paper edition will require resources from the newspaper company, keeping expenses low is first priority; therefore, the first scenario suggests a fully automated workflow with no need of editors working specifically with the edition. If the existing production workflow at a newspaper company cannot be easily adapted to an automated process, the second scenario of depending on dedicated resources working full-time with the e-paper edition could be preferable. The third scenario suggests that the e-paper edition is created on the fly whenever a user requests the latest available news or e-paper edition. This scenario requires a large degree of automation and that the material can be stored in standard formats.

The paper concludes that the e-paper edition could be regarded as a crossbreed between the online and the printed edition, with the advantages of an electronic edition and a workflow similar to traditional newsprint. A future e-paper product could, with the right technology, offer such advantages to the newspaper companies as new business models, enhanced advertisements formats, moving images, personalization and interactive services.

One crucial factor when introducing e-paper on the market is the intended target groups. In the first phase of introduction of e-paper, the suggested target groups are:

- emigrants
- people living in sparsely populated areas
- roaming readers
- people preferring to read an on-line edition of a newspaper rather than the printed edition.

The main challenges to overcome when starting to work with e-paper editions at newspaper companies are: selection of material suitable for the product, automated

scaling of editorial and advertisement material, handling of high resolution graphics, pagination, copyright issues, editioned pages, layout aspects, human resources, distribution and promotion of the e-paper edition.

The findings of the paper are presented as a most likely scenario based on the three scenarios presented earlier in the paper. The paper suggests that the most challenging problem of those listed above is to solve the conversion and scaling of advertisements regardless of their initial format. Furthermore, the paper discusses that the near future e-paper product could be a complement to traditional paper rather than a threat to the printed edition.

## **5 Discussion and Conclusions**

Currently, strategies for newspaper companies to publish in several media channels involve processes of convergence. Convergence implies that previously unlike areas come together, approaching a common goal. Media convergence is a concept that has become common when denoting a range of processes within the production of media content, its distribution and consumption. The concept of media convergence has achieved buzzword status in many contexts due to its widespread use.

The view on and strategies for publishing in multiple media have changed. Parallel publishing was first introduced at newspaper companies when the on-line editions were started, but multiple channel publishing has replaced it as other publishing channels have been developed, used and accepted by the companies. There are indications that convergence processes have steered the development towards multiple channel publishing. Examples of the effects of convergence involve the use of a central news desk and the introduction of new digital publishing channels and payment methods, as well as changed consumption of the media content and channels. How the newspaper industry is coping with the effects of convergence is discussed in all of the included papers.

It is the author's opinion that newspaper companies distinguish themselves from other media companies by their ongoing willingness to test new technology and services at an early stage in their development cycle. This, alongside with convergence processes, contributes to the use of multiple publishing.

The publishing industry has always been a technology-driven industry (Enlund, 1996:2). However, the strategy of newspaper companies when venturing into new technologies seems to be somewhat vague as they tend to adopt new trends and acknowledge hypes rather than strategically planning for the future. Block and Nilsson (1971) claim that every new technology can be said to open a door, but this does not necessarily mean that we should enter. And even if the newspaper companies choose to enter, do the consumers really want to follow?

The multiple channel editions produced by the newspapers constitute one effect of convergence. Because many newspaper companies are today producing content for multiple channels, they are handling these effects of convergence by adapting their production workflows from producing content primarily for the printed edition to including the other editions. Convergence of technology has made it possible to store, edit and publish material over many different networks using the same tools and the same database system. If the content is stored in a neutral format, it can be packaged and used in many different types of publishing channels.

The production workflows at newspaper companies are designed in a certain manner due to tradition, organisational issues, technological constraints and economical factors. The production workflow of a newspaper involves four main stages: creation, packaging, distribution and consumption of content. Editorial and advertisement systems manage much of the preparation of the material for the different publishing channels and several editorial, advertisement systems and software programs are often combined in the workflow of the newspaper companies, making it difficult to adjust depending on the system supplier. At present, the studied newspapers largely separate the printed content production workflow from the on-line production workflow. Furthermore, the advertisement system is separated from the editorial system. Thus, the newspaper companies and the manufacturers of editorial and advertisement content production systems have to consider these traditional structures when designing the new production systems for the workflow of the different editions.

The production and distribution of digital services at newspaper companies can be largely automated. However, according to the studied newspapers, a fully automated workflow for all publishing channels is undesirable and impossible to achieve with the existing technology, standards and organisational structures. It is the author's opinion that storing the material in a neutral format, such as XML or dialects of XML, in a central database system for easy access within the company is the key to efficient publishing solutions. A solution is not easy to find regarding distribution of the content. This is due to a number of outside factors that can be difficult to control, such as network connections of the consumers, payment systems of the products, copyright laws and network capacity.

Just as there are convergence strategies for the production workflow inside the newspaper companies, there are also convergence strategies between newspapers and other media companies. Such strategies are briefly discussed in Paper II, where one example is cross-promotion between newspapers and television companies. Technology development and company mergers have contributed to convergence. Alternative publishing channels as well as established new services first brought about as test-projects involving processes of convergence have become threatening to the traditional publishing channels (newspapers). They compete for their consumers' time and might lead to decreased advertisement income since advertisers tend to go where the audience is.

New publishing channels compete with the printed edition in terms of advertisements. In Sweden however, the inclination to advertise in printed newspapers is high and local newspapers often control the advertising market in their specific region. Moreover, newspapers have strong relationships with the readers of their printed edition, a well-defined target group.

New publishing channels can make use of the workflow of the printed edition. To maintain high quality as one of the newspaper company's many editions, content for a new publishing channel can be produced with minor additional investments. The development is currently heading towards multiple channel publishing, but whether it is desirable to use the same production workflow for all publishing channels needs to be taken under careful consideration. Just because it might be possible to use a general publishing workflow does not automatically make it the best decision from, for example, a journalistic, economic or ethical perspective.

As developments in technology have made it possible for the introduction of new publishing channels in media publishing companies, questions about the future of the printed edition have been raised. Will printed newspapers eventually be replaced by digital ones? Is it only a question of *when* the printed edition will be abandoned by the public and thus cease to exist, or is this just an unfounded fear from the newspaper companies?

This year, 2005, is the 400<sup>th</sup> anniversary of the first printed newspaper. According to the World Association of Newspapers, the first published newspaper in print, *Relation*, was printed in Strasbourg in the summer of 1605 (WAN, 2005). The printed newspaper has survived for 400 hundred years, but is it now challenged by digital newspapers? The question of what will happen with the printed edition as the range of publishing channels increases and the technology behind the different channels converges is a complex one, depending not only on the possibilities of the new technology, but also on several other factors, such as the pattern of behaviour among the readers, trends, time and culture. This thesis does not aim to answer the question about the survival of the printed edition, but to acknowledge the strive to find an answer to the question as a driving force for research in future newspaper production, education in journalism and media technology, development of technology and content services and planning of strategies and future investments at newspaper companies.

Assume that printed editions will be replaced by digital and converged editions. The possibility exists. However, a replacement of printed editions does not solely depend on what is technologically possible, but what strategies the newspaper companies choose and to the greatest extent, by what the readers such as the man portrayed in the introductory scenario of this thesis will adopt, consume and pay for.

## **6 Author's Contribution to the Papers**

The order of writing the papers was as follows, Paper II, Paper III and Paper I. The papers are not ordered chronologically in the thesis. The author has contributed to the papers in the following manner:

### **Paper I**

The paper was entirely written by the author.

### **Paper II**

The case studies in Paper II were initiated by the Swedish Publishers' Association and were carried out together with Katarina Båth. The studies resulted in three reports (Appelgren and Båth, 2002a, b, c) in Swedish written by the author and Katarina Båth. The three reports and literature studies were the source of material for Paper I. The author is the main contributor and writer of Paper II.

### **Paper III**

The case studies, interviews and literature studies in Paper III were carried out by the author. Initial ideas for the paper were discussed and decided on by all authors of the paper before the study was initiated. The author is the main contributor and the sole writer of the entire paper.

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## **8 Included papers**



## Paper I



# CONVERGENCE AND DIVERGENCE IN MEDIA

## – DIFFERENT PERSPECTIVES

ESTER APPELGREN

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A current issue in the media industry is coping with the effects of convergence. The concept of convergence is frequently used both in the academic field and within the media industry to denote the ongoing restructuring of media companies as well as to describe the latest developments in media forms, distribution, and consumption. However, there is currently no generally accepted definition of the concept. Depending on the context, the meaning and connotations vary. Some researchers suggest that convergence is a result of a change toward a more modern media society while others treat the concept as denoting the actual process toward a more efficient management of the media value chain. This paper discusses various definitions of convergence, both in a historical perspective and as it is used and understood in contemporary media and communications research, one aim being the evaluation of how the meaning of the concept has evolved during the past decade. The study is based on literature research and one conclusion is that convergence is a process dependent on current circumstances within society. The use of the concept has therefore developed from being mainly connected with digitalization in media technology to also include elements of integration, combination, competition and divergence. This paper suggests that convergence should be seen as an ongoing process of media and media industry development that is dependent on and in continuous interplay with a contrasting and complementary process, that of media divergence.

**Keywords:** Convergence; divergence; multiple media publishing.

### INTRODUCTION

In the field of media technology, the concept of convergence has for decades frequently been used to describe concentrating courses of events in terms of processes becoming more alike or as a common denotation for a change toward a certain goal. Several research groups have suggested models for media convergence such as the

intersecting circles presented by Negroponte in the late seventies (Figure 1) [1], the European Union's definition of convergence areas [2] and, more recently, through forums such as the Newsplex project in the US [3], to mention a few. Despite the fact that the convergence phenomenon has given rise to several research projects and developments in the media industry all over the world, there is currently no standard definition of the concept. In the literature, convergence is discussed mainly from two points of view. The first suggests convergence to be a result of a change in the media society whereas the second treats the concept as a way of denoting the actual process toward a more efficient management of the media value chain. This paper, based primarily on literature studies, will present a review of some of the existing models for media convergence.

## **GENERAL DEFINITIONS OF CONVERGENCE AND DIVERGENCE**

The concept of convergence is used in a number of academic fields. In the context of media technology, it has almost become compulsory when presenting new technology or services. From literature studies it has become clear that divergence is defined as the opposite of convergence; however, both concepts can sometimes be used to describe the same phenomenon. The models presented in this paper have their origin in previously published media research. Since many definitions share similarities, each studied definition has not been included in this paper.

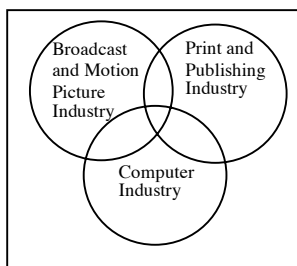
The definitions of convergence in other fields than media are somewhat similar to each other. In the Swedish National Encyclopaedia, NE [4], there are several definitions of convergence. According to NE, within the field of mathematics, convergence denotes a move toward a certain value in series of values. In oceanography, convergence deals with a horizontal inflow of water into an area. In medicine, convergence denotes the pointing inwards of the eyes, which occurs when viewing an object at close range. The biological definition of convergence describes how similar biological structures have been developing from separate sources of origin. Examples of biological convergence are the flying vertebrates such as flying lizards, birds, and bats. However, the convergence process in the biological sense is never completed. The organism's original heritage is always preserved in some form [4].

Divergence, being essentially the opposite of convergence, is commonly defined as a drawing apart, as of lines extending from a common centre, the acquisition of dissimilar characteristics by related organisms in unlike environments and a deviation from a course or a standard [5]. Similarly to the concept of convergence, divergence is frequently used within several academic fields such as mathematics, optics, and biology.

Several other terms are frequently mentioned in the studied literature in the same context as convergence, such as alliance, partnership, sponsorship and collaboration [6].

## THE CONVERGENCE CONCEPT IN MEDIA RESEARCH

The Latin word for two entities coming together is "convergere" [5], and might first have been described in the literature by a theologian named William Derham [7]. However, the first media researcher to describe convergence was according to Murali [8], Ithiel de Sola Pool in his book "Technologies of Freedom" discussing the interdependence of various media. The first introduction of the concept media convergence into media research might have occurred even earlier, in 1979, when Nicholas Negroponte presented a convergence model based on three intersecting circles (Figure 1).



**FIGURE 1: NEGROPONTE’S CIRCLES DESCRIBING THE MIT MEDIA LAB’S CONSTRUCT OF CONVERGENCE [1].**

The circles illustrate how three media industries come together as a single entity [1]. From the presentation of those circles, the media convergence debate has continued. Over the years, convergence as an effect rather than as a process has been used to denote everything from organizational structures, new high-technological inventions to mergers between media companies.

Trying to explain the phenomenon of convergence, Golding and Murdock [9] describe convergence in the following manner: "For the first time, all forms of communication – text, statistical data, images both moving and fixed, music and speech, can now be encoded, stored and forwarded with the same fundamental digital vector of zeros and ones, the language of the computers. The result is that the boundaries for what up until today have been separate areas of communications are now dissolving. We are now entering the era of convergence. The potential is impressive and new combinations are becoming possible" [9]. This definition of convergence is essentially a description of digitalization, which along with Negroponte’s circles are a common ground and starting point for defining convergence.

In Europe, during the 1990’s, convergence was considered to be the driving force behind developments in telecommunications, media and information technologies. In 1997, the European Union [2] presented a definition of convergence suggesting two possible uses of the concept, the first one being the possibility for many types of networks to distribute principally similar services and the second being the merging together of different electronic appliances such as telephones, television sets and computers.

The Swedish Government Commission on convergence [10] presented a similar description dividing the concept into four parts: net, service, electronic

appliances and market convergence. The Swedish Agency for Innovation Systems (Vinnova), presented a similar model in 2001 [11], pointing out four areas of convergence: services, electronic appliances, networks and market convergence. According to Vinnova, convergence of services occurs when information traditionally connected with a certain media channel is provided through alternative media channels. An example of this is when TV channels broadcast programmes usually broadcast in the national TV broadcasting nets, on their websites as web TV. Convergence of electronic appliances happens when different types of electronic gadgets are combined. The combination gives rise to new functionality than that afforded by the original uncombined electronic appliances. An example of this type of convergence is 3G telephones, combining telephone services with services originally used in handheld computers. The third area of convergence, according to Vinnova, is network convergence, which involves the integration of separate infrastructures and the distribution of services from other areas than the services traditionally distributed over a certain network. Internet is the superior example of network convergence, since it simultaneously functions as a publishing tool displaying content and as a means of two-way communication. Market convergence, as described by Vinnova and The Swedish Convergence Commission, is convergence involving the market forces. This convergence type appears as a result of the three types of convergence mentioned earlier. It occurs when actors in the market move into adjacent areas, which had not previously been their primary areas of interest.

The second and fourth types of convergence, as described by Vinnova, are also described by Flynn [12]. He identifies three areas of convergence in the digital world: devices, networks and content. The convergence of devices is, according to Flynn, when two devices are merged together. The challenge is whether the consumers will use these merged devices or not. Flynn claims, that if there is no consumer adaptation of the resulting hybrid, convergence will not take place. Convergence of networks originates from the discussion and development of the once popular concept “electronic information superhighway” denoting a broadband-switched network infrastructure. The content convergence, in Flynn’s opinion, is limited since he believes that technological barriers still make it impossible to use the same kind of content in all the different publishing channels. Flynn argues that the conventional view on convergence over-emphasises the benefits to be derived from the potential advent of “write-once-run-anywhere” content and instead suggests a fourth type of convergence, that of the consumers. Flynn seems to have adopted an almost philosophical view of convergence of devices, claiming that it does not exist if the consumers are not willing to use the new devices. However, if the devices exist, the convergence of devices must have taken place in the production of the new device, regardless of the consumers’ willingness to use it.

Media content production is an area where the concept of convergence carries yet another meaning. There are several current definitions of what could best be denoted as newsroom convergence. This type of convergence involves sharing of resources within and between media organizations [13]. At the Newsplex facilities at the University of South Carolina, USA [14], research is focused on convergence processes taking place within the editorial departments at media companies. The researchers at University of South Carolina have, in cooperation with the international

newspaper technology organization IFRA and a number of other partners, built a media content production facility called Newsplex where the editorial department of the future is developed and tested [3]. In the media content production companies of the future, reporters work on written content as well as with audio and images for multiple publishing in all conceivable publishing channels. Convergence in content production also involves editorial system technologies and the professional role of the reporters.

Convergence in media content production is also discussed by Enlund and Lindskog [15]. They describe editorial convergence but also convergence of devices used for displaying content. According to them, many devices are incarnations of the same basic technical solution and they believe that these devices can converge toward a generic media machine. Enlund and Lindskog exemplify convergence in content production as integrated computer systems supporting news production for a number of publishing channels. These definitions use convergence as a way of denoting ongoing developments within media. Enlund and Lindskog argue that the devices are converging even though the content published in these devices at the same time may be diverging. The number of media channels increases with the new possibilities in the content production technology. At the same time Enlund and Lindskog might be right in denoting it as convergence since the same content can be published in all the different media publishing channels. A TV can in this manner be used for surfing on the Internet and a computer for watching TV programmes.

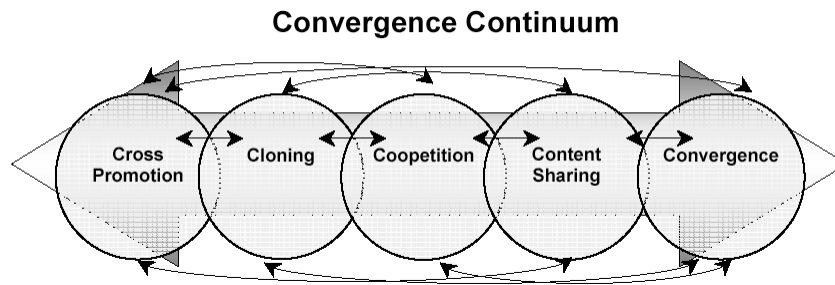
It is the author's opinion, that the combinations of components into a future generic media machine is convergence of purposes for using the device, but not convergence of technology, since in some cases only the components are combined into a new device. The device itself has been subjected to a process of combination rather than a process of convergence. The content, however, is in this manner converging.

Instead of concentrating on content and technology, Gordon [16] identifies five types of convergence: ownership, tactical, structural, information-gathering and storytelling convergence. Ownership convergence could be compared to merging of companies. Tactical convergence is a form of cross promotion, structural convergence is a process taking place within the editorial departments, influencing the editors to become more of multimedia editors. The information-gathering convergence, as described by Gordon, could best be summarized as a form of backpacking journalism where the reporters carry all their equipment with them, producing content for all imaginable publishing channels. Storytelling convergence is, according to Gordon, about new ways to present information in the different publishing channels.

## **RECENT MODELS OF CONVERGENCE**

Dailey, Demo and Spillman [13] have presented a model of convergence called "The Convergence Continuum". The model has been created because of the authors' belief that there is a lack of a common, behaviour-based definition of convergence and a lack of a common instrument for measuring convergence effects. They therefore suggest a model for convergence in newsroom content sharing with the

purpose of making it easier for researchers all over the world to compare results. The model consists of five partly overlapping areas (Figure 2):



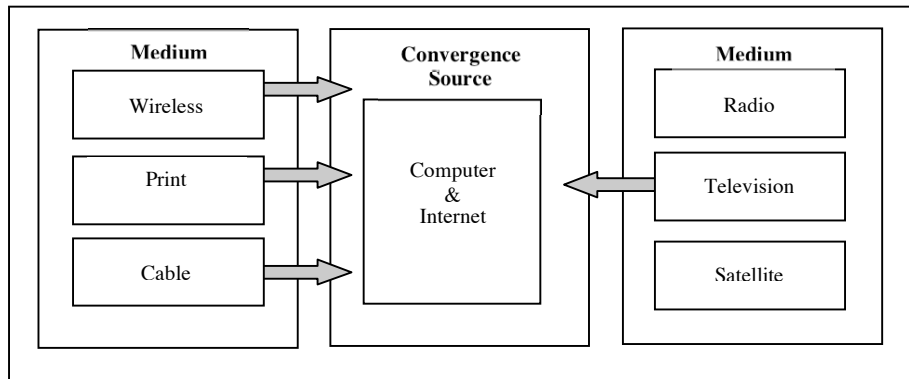
**FIGURE 2: THE CONVERGENCE CONTINUUM [13]**

According to Dailey et al., cross promotion is defined as when partners cooperate and promote each other through their media publishing channels. Cloning is the stage where material is re-published in several publishing channels with minor adjustments or re-editing. Coopetition is when material is shared among several of the competing but cooperating partners involved. Content sharing is where the partners involved exchange material and publish it in their respective publishing channels, after repackaging the content to suit each specific publishing channel. Full convergence exists, according to the authors, at the level where the cooperating partners share a central news desk. The work is performed in groups with representatives from several publishing channels, and the group members cooperate in both gathering and disseminating the news. In this manner it is possible to use the strengths of the different media publishing channels and emphasize aspects in the specific news content in different ways depending on the chosen publishing channel. For true convergence to happen, the designers of the Convergence Continuum model believe that the partners involved need to agree on news values.

Dailey et al describe this model in detail. The graphical representation of the model, however, is hardly intuitive as the areas toward convergence are placed on a straight line, with arrows pointing between all areas. It would seem simpler to place the circles on a circle with all areas intersecting, much resembling the model presented by Negroponte in 1979. To use the model to measure the effects of convergence in a uniform way in order to compare results seems like a difficult task since convergence not is measurable unless target variables are introduced. Some measure of time, money or other resources is required to enable such comparisons to be made. Furthermore, this model is applied to convergence in newsroom content sharing, and is of little relevance to other types of convergence processes.

Lawson-Borders [17] suggests another model of convergence, where the starting point is that convergence is a “concept as well as a process”. She does not discuss creation of content to the same extent as is discussed in the Convergence Continuum, but has more of a technological approach. She claims that convergence could be described as a wedding of technology and content delivery by means of

computer technology (Figure 3). She describes convergence as “distribution of content through the blending of traditional and new media which leads to doors opening to new opportunities in the media industry”. The consequence of this convergence process is that the traditional one-way communication model is modified to include two-way communication.



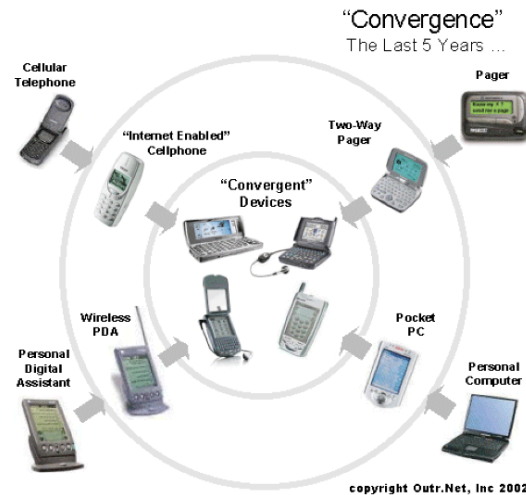
**FIGURE 3: LAWSON-BORDERS’ MODEL OF CONVERGENCE [17].**

Lawson-Borders has identified seven “observations” of convergence all beginning with the letter c: Communication, commitment, cooperation, compensation, culture, competition, and customer. These seven areas are partly overlapping and can serve as a guideline for best practises to expound on convergence both as a concept and a process [17]. The difficulty of using Lawson-Borders’ image of convergence as presented in figure 3, is that the consumer and the market are left out of the discussion. If the model is two-way oriented, the consumers should be included. The suggested seven areas of convergence are however important in the ongoing debate. The two areas compensation and culture are often left out of the discussion even though they are of great importance for both those working in media and for the audience. For journalists working with multiple media, compensation is of interest, since many models for compensating journalists still are based on the belief that journalists work with one single medium only. As content is published globally, cultural differences might influence the popularity of the content as well as the way it is presented to suit its audience.

Contradictory to Lawson-Borders, Jenkins [18] does not try to combine many types of convergence into one model. He explains the confusion when attempting to define convergence to originate from the fact that people talk about convergence in several contexts. He divides convergence into five areas, technological, economic, social or organic, cultural and global convergence. Technological convergence is the digitalization of all media content, economic convergence deals with the integration of the entertainment industry and the social or organic version of the process handles the consumers’ multitasking strategies for navigating the new information environment. According to Jenkins, cultural convergence is the explosion of new forms of creativity

at the intersections of various media technologies, industries and consumers. Finally, global convergence is the cultural hybridity that results from the international circulation of media content. This definition is in line with the author's belief that convergence is a process rather than an effect and that it is important to distinguish what area of media convergence that is discussed.

In the non-academic context, several models of convergence flourish. The most common way of visualising convergence in both the non-academic and the academic world is perhaps by giving examples of convergence of devices as in figure 4.



**FIGURE 4: "CONVERGENCE" THE LAST 5 YEARS... [19].**

Convergence of devices is often described as integration or a combination of several products into one super-device. Dekerf et al. [20] believe that one device will enable access to all media content. They claim that this device will know us better than we know ourselves. With the launch of this device, printing plants will become museums but media companies do not necessarily have to go the same way. Dekerf et al. claim that the core of convergence is having one distribution channel for everything, no middlemen and no more possibilities for the media publishing companies to control the supply chain. They suggest that media companies, such as newspapers, in a near future will be subjected to "napsterization" of their companies, where the player who controls the super-device is "king". With this line of reasoning, they argue that newspapers should learn to sell content, not print. When news is seen as the core product of the newspaper companies, the distribution process becomes less important.

Furthermore, Dekerf et al. claim that discussions about convergence are quite industry-centred. In the end, however, the consumer (buyer, reader, viewer, listener) is in control. He or she decides on what to read, buy and see [20]. With this way of reasoning, "napsterization" of news is not difficult to imagine and has indeed already

happened with services such as Google News [21] and companies specializing in sending out e-mails with customized collections of news from the news bureaux all over the world.

## **DIVERGENCE IN MEDIA**

One recent trend regarding information has been about “more”. If something is unclear, it is blamed on the lack of information, and the solution has so far been to add more. But when it comes to documents, the opposite occurs – a strive toward less information and at the same time more content and context than before [22]. In Fidler’s book “Mediamorphosis” [1], convergence is said not to lead to fewer forms of communication nor to established traditional media becoming extinct.

A recent media publishing trend is the creation of niche publishing channels focusing on a certain topic or a specific target group. Enlund and Lindskog [15] describe how the range of information from a consumer perspective has widened, as content now is available in many more publishing channels than before. In this manner, interactivity and niche publishing encourages divergence, but at the same time the technology behind the services and the production workflow, prior to publishing in the different channels, are converging. When the areas involved in a process are either converging or diverging at the same time, describing the process as one event can be somewhat confusing.

Interactive services enable divergence in media as the range of publishing channels increases with the consumers’ own will to contribute to the information flow. One example of the consumers’ wills to contribute is the growing blogging culture on the Internet. The word blog is derived from weblog [23] and the blog format is becoming a popular way for people all over the world to communicate. The original weblogs were link-driven sites with commentary and personal thoughts [24]. As the “blogosphere” has grown, many blogs are now more similar to diaries where the editors post their personal thoughts and other bloggers comment on them. Several media companies have adopted the blogging trend. Blogs connected to on-line editions of large newspapers have become common and news might be subjected to discussion in the blogging community for a long time after they have happened.

Whether something is diverging or converging, however, depends on the observer’s frame of reference. Seen from a newspaper company’s point of view, digitalization as the core reason for convergence might lead to divergence as the range of content becomes fragmentized. As seen from the consumer’s point of view as an individual, a wider range of information channels indicates divergence.

The strategies of media companies and players involved in, for example, the manufacturing of new technology, can shape whether a device, a usage trend or certain content might be subjected to a process of convergence contra divergence. One example of strategies shaping the process of convergence or divergence is the development of electronic paper. Some of the e-paper terminals currently under development are made for interactive use while others only will support one-way-communication, functioning as pure reading tools [25]. If e-paper is going to be developed as a one-way communication tool, it will become yet another gadget, adding to the range of different media gadgets available on the market; a process of divergence. If the e-paper terminal instead is developed to be compatible with many

formats and to be an interactive tool with more to offer than just displaying written text and images, it will, on the contrary, be part in several types of convergence processes. At the present time, it is still unclear what functionality e-paper terminals will have. So far, only prototypes from research labs have been shown to the public.

## DISCUSSION

Convergence in media as it was defined at the end of the 1990s mainly concerned the data, broadcasting and telecom industries, focusing on convergence of networks and services. The Internet and multimedia in general were regarded as new media where the difference between new and old, with the exceptions of radio and TV, mainly was that traditional media forms had been static while the newer media forms were dynamic and constantly subject to development and improvements. During the first years of the 21<sup>st</sup> century, researchers began to describe convergence as not one process but as several more or less interacting processes occurring in different fields. Several models of convergence were presented, often involving other similar concepts such as cooperation, cross-promotion, content sharing, integration or combination. In the year 2004, convergence has become more of a niche concept, used for almost any field to describe developments of new technology, but having different connotations and meaning depending on which niche it is describing.

Media convergence is an ongoing process, occurring at various intersections between media technologies, industries, content and audiences; it is not an end state [18]. The driving forces behind convergence are often discussed and the theories vary. Berger [26] believes that the force behind convergence is competition, and that people, not technology make convergence happen.

The definitions of convergence and the connotations associated with the concept have been subject to change over time. Even though the definition of convergence is the opposite of divergence, in media, the two concepts appear together, hand in hand. The publishing channels are said to converge, at the same time new interactive publishing channels are being created.

Hujanen and Ferrell Lowe [27] claim that if convergence is the prerequisite and digitalization is the platform, then the prerequisite is a utopia. Since convergence in this paper is regarded as an ongoing process, it has no ending. If the process ends, another process starts. To see convergence as an end-state or effect is then a utopia. The effects of convergence are sometimes, in my opinion incorrectly, denoted in the literature as convergence. The correct way of describing the effects of convergence is by using other related concepts, such as integration, combination, merging, cooperation or cross promotion, to name a few.

It is the authors belief that for companies such as the newspaper publishers, manufacturers of technological devices and the people working in journalism and communication industries, the effects of convergence are more interesting to observe than the process of convergence, since it is the outcome of the processes that affects us, not the process itself. If convergence is to be seen as a well-defined generalized concept that is applicable in the same manner to all aspects of media, defining it is then certainly a utopia. However, if convergence is used to describe separate processes and not end-states within the media industry, media content production or the distribution of media content, it is possible to define and use the concept for many

different situations. Furthermore, it is important to keep in mind that convergence in one area within processes related to the media market might be of a totally different nature than convergence in another area. And as convergence is taking place in one part of a process, divergence in another related area might appear as a result of this process of convergence. Convergence and divergence are conceptually two opposites, but in reality they often appear side by side or as a consequence of each other.

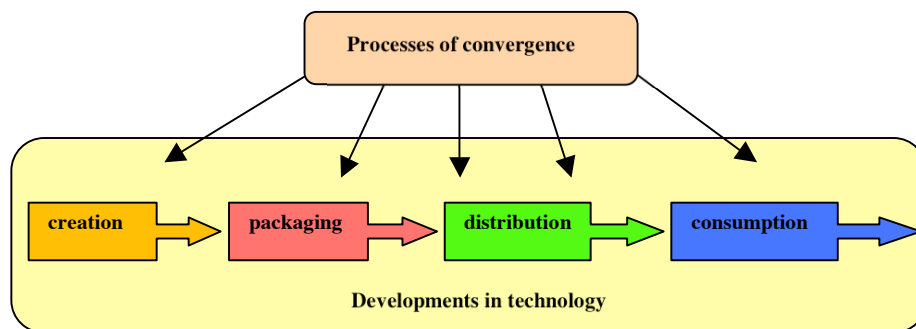
As convergence and divergence are used to denote changes, the concepts themselves are also subject to change. Over time, the concepts have been applied to new areas, making the connotations of the concepts change slightly, depending on the area in which they are discussed. The definitions of convergence and divergence will therefore most certainly continue to evolve in the future, alongside with changes in our society.

## CONCLUSIONS

The concept of convergence has become a buzzword, popular to use when describing several different processes and effects in media technology, the media market, consumption of media, and creation of content. Jenkins [18] discusses the confusion in the definition of convergence originating from that people try to use the concept in the same manner for several separate contexts.

There are many factors to consider when discussing and using the concept of media convergence. Convergence is to be seen as a process, and not as an effect. The effects of the process of convergence are visible, measurable and possible to detect, while the actual process might not be. The process of convergence can be strategically planned and is influenced by market forces, trends in society, and technological developments. Divergence is another process, also creating effects. These effects can sometimes be similar to the effects of convergence. As one process ends, another starts and convergence and divergence can therefore follow after the other as well as running in parallel.

Developments in technology have made many types of convergence processes possible, such as the digitalization of content, the integration of components and the combination of different devices into new multi-tasking devices.



**FIGURE 5: THE VALUE CHAIN FROM CREATION TO CONSUMPTION OF CONTENT IN MEDIA PRODUCTION.**

If technology development is regarded as a process taking place in the background and enabling developments in the media production and distribution industry, the process of content creation, packaging, distribution and consumption in media can be visualized as in figure 5.

Convergence processes can be present in all stages of the value chain in figure 5. To show where the models presented in this paper could be applied, I will here give some examples: The model by Daliey et al. [13] and the definition by the researchers at Newsplex could for example be applied to the creation and packaging stages.

Lawson-Borders' model is mainly applicable to the consumption stage but also in some respects to the creation stage. Flynn is mainly interested in the last two stages concerning distribution and consumption. Not all of the presented definitions are directly applicable to this value chain, mainly because some models are based on the view of convergence as an end-effect. Furthermore, many models include other areas of convergence equally important, however not in my opinion as interesting when describing the creation and distribution of media content as seen in figure 5.

In literature there seem to be as many definitions of convergence as there are authors discussing the topic. The irony in this jumble of convergence definitions is that as the term "convergent thinking" describes thinking focused on finding one predetermined correct solution to a problem [4], the attempts to define convergence so far are so many that the range of definitions tends to diverge. My opinion is, that defining convergence is subordinate to the study of the effects of the processes since what is being created in the processes of convergence is what affects us, thus shaping our society and the media publishing companies.

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## Paper II



# **Evaluating Digital TV as a Publishing Channel for Newspapers**

Ester Appelgren\*, and Stig Nordqvist\*\*

Keywords: Digital TV, newspapers, standards, cross media publishing

**Abstract:** Can there be synergies between newspapers and digital TV? What business synergies exist and are the technical formats reliable and flexible enough for cross media publishing?

At the end of the 1990's, several Swedish newspapers applied for a license to broadcast digital TV. The major trend among newspapers during this time was to develop websites as a secondary publishing channel, and many companies withdrew their applications. Today, digital TV is again raising expectations. When digital TV broadcasting technology replaces analogue broadcasting, the media landscape will change. The conversion will offer new publishing and business opportunities for newspaper companies.

We have studied three Swedish newspaper companies actively working with TV production, three major Nordic television companies, and five television broadcasting operators in Sweden.

The objective is to give a wider perspective on the digital TV publishing market today, focusing on technical as well as on economical aspects. In addition, we have evaluated the next steps for newspaper companies interested in establishing themselves in the digital TV medium.

The study indicates that among the viable strategies for small and medium sized newspapers are entering the digital TV business through text based services and using cross promotion in order to strengthen the brand.

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# INTRODUCTION

## Background

The competition between different media publishing channels has changed. TV now competes with newspapers, and especially evening newspapers. Despite the fact that this paper focuses on the strategies of Swedish publishing companies, the competition between different media publishing channels is comparable with other European countries. The situation is somewhat different in the US and we have therefore limited the goals of the paper only to include strategies for Europe and particularly the Nordic countries.

The circulation decrease the newspaper industry in Sweden recently experienced could, to some extent, be caused by the increased range of TV channels. The situation is similar in other Nordic countries. TV now offers most of what the evening newspapers provide, as well as moving pictures, voices and live broadcasts. The real crisis will become more apparent when classified advertisements move from newspapers to other formats such as digital TV and computerised communication systems [Hvitfelt, 1999].

The transition from analogue to digital TV technology has so far given broadcasting companies the possibility to cut distribution costs. For this reason, operators have encouraged the development of digital TV. DTV technology offers new features such as advanced text based services and interactive TV applications. The frequency range can be used more efficiently, making room for more TV channels. This makes it possible for parties not traditionally involved with broadcasting to work with TV. It is therefore important for newspaper companies who wish to work with TV, to have good relations with established broadcasting companies.

## Objective

In 1998, the Swedish Newspaper Publishers Association performed a study on digital TV for newspaper companies. At the end of the 90's there were high expectations on digital TV. Several newspaper companies applied for broadcasting licenses for TV, but due to financial reasons they withdrew their applications. At that point in time, the trend turned towards investing in the development of newspaper websites [Lindskog et al, 1998] and in the core product – the printed edition of the newspaper.

Four years later, digital TV is yet again raising expectations. Investments in digital TV are now a central part in many decision makers' agendas. Newspaper companies are trying to establish themselves in other publishing channels than on printed paper. This trend is also noticeable in other countries, not just in Sweden. In the neighbouring country Finland, one of the largest daily newspapers Turun Sanomat is successfully working with TV services and integrated editorial workflows [Lindskog, 2003]. The most well known multiple publishing project is NewsPlex, in Columbia, USA, where IFRA and USC have designed and built a publishing house especially suited for multiple channel publishing [Quinn, 2002].

The objective of this paper is to give a wider perspective on the digital TV publishing market today and to evaluate digital TV as a publishing channel for newspaper companies. We have therefore focused on technical as well as on economical aspects with digital TV and evaluated the next steps for newspaper companies wanting to establish themselves in the TV medium.

### **Method**

This paper is based on a study done by the authors for the Swedish Newspaper Publishers' Association during 2002.

Extensive interviews have been done with three Swedish newspaper companies to see which synergies exist between TV and newspapers, regarding approach and size. The case studies have been made on an evening newspaper, a daily business newspaper and a regional morning paper.

In order to discover the problems with digital TV and interactive TV services, interviews have been carried out with three of the leading TV stations in Scandinavia and with the major Digital TV operators in Sweden.

Other sources of information have been literature, conferences and hearings. The interviewees have been contacted to validate their statements and a reference group within the Swedish Newspapers Publishers' Association have been used to get feedback on relevant issues for the study.

## **CONCEPTS AND TERMINOLOGY**

### **Convergence in content and technology**

Economic forces and the new digital technological capabilities available have at the end of the 20th century brought some of what were once competing organisations in under the same roof [Ifra, 2002].

There are several definitions of convergence, and we will here mention two definitions:

- Convergence in content
- Convergence in technology

The convergence in technology and content has changed the traditional value chains in media publishing. This means that various functions of the value chain converge over the media barriers – the same content is produced for several media [Södergård, 2001]. The convergence in technology has made it possible to publish the same content on many types of platforms thus opening up for cooperation between media companies with different primary publishing channels.

### **Broadcast TV, moving images on the web and interactivity**

We will discuss moving images in two areas: broadcast television and web TV. In order to watch digital TV broadcasts the consumers currently need a set top box (STB) that can decode the signals and feed them to the television set.

Digital TV offers interactive services to the customers in addition to the broadcast television shows. Interactivity can be divided into three primary modes of interactivity – local, one-way and two-way [Flynn, 2000].

### **Multiple channel publishing**

Sabelström Möller [2001], suggests two types of multiple channel publishing. In the first type content is produced for several output channels at the same time without a primary edition in mind, the second type is when a company focus on one primary edition and produce content for other publishing channels by the use of re-editing.

## **THE SWEDISH DIGITAL TV MARKET**

The Swedish broadcasting market has changed radically since the middle of the 80's. Before 1987, the Swedish state television had a monopoly. Digital cable started broadcasting in 1997, digital satellite started broadcasting in 1998 and in 1999 digital terrestrial broadcasting was introduced in Sweden.

There are three major forms of broadcast DTV in Sweden today.

- Digital Terrestrial Television
- Digital Cable Television
- Digital Satellite Television

From the customer's point of view, which broadcasting form to choose is not a technical issue, but instead an issue concerning residential area and the desired type of TV channels.

Digital TV (DTV) is still in its infancy and we might see successful interactive TV services in the future.

A prognosis made by the magazine the Economist (2002), says that in 2005, Germany will have reached 55% of all households, in France 45%, Britain 70% and in the U.S. 65%. Britain is a clear leader in respect to their business development and the amount of households that they reach.

According to Magnusson [2002], Sweden is right now in the state where only the early adopters use DTV. The situation is different in the UK where the market is huge in comparison with the Swedish DTV market. With more than 6 million DTV viewers

[Pay TV & Satellite News, 2002] it is easier to test new interactive services. The British viewers have, unlike the Swedish viewers, had access to technical support when plugging in the modem return channel.

The market is not yet mature and the operators are currently testing new business models hoping to make money in the long run. At the same time they are trying to bind the viewers to themselves by sponsoring set top boxes and developing proprietary formats.

### **THREE CASE STUDIES - TV COMPANIES**

#### **SVT – the public service company wanting DTV to be a right of common access**

SVT, Swedish public service is the largest TV company in Sweden. They broadcast on all the three platforms, terrestrial, satellite and cable.

During the spring of 2002, SVT launched the idea of a set top box called “folkboxen” (the people’s box). It was intended to be an inexpensive set top box, with only basic functions. All those paying their TV-licenses would receive an offer to buy an optional set top box. Through this proposal, SVT hoped that the Swedish people would switch to the new technology and that it, in the long run, would strengthen the development of DTV.

The basic boxes would only function as a receiver of digital signals and probably not contain a conditional access system, which would make it possible to receive encrypted signals. It would be possible to receive text TV services, but not services that require click-through. Each TV in the household would necessitate a box of its own unless everybody in the household wants to watch the same channel at the same time.

The production flow at SVT has recently become completely digital. The conversion has brought positive effects to many areas within the company. Apart from the obvious benefit of not having to convert analogue material to digital and vice versa in the TV production flow, there have also been positive convergence effects between the different publishing platforms. For example, material from broadcasted TV shows, because of the digital production flow, can easily be published on SVT’s website. This development could be categorized as a convergence of content, where the same content is used in several publishing channels.

#### **TV4 – to find the balance between commercial interests and high technological goof-projects**

The largest Swedish commercial TV channel, TV4, broadcasts analogue and digital programs over all the three broadcasting platforms. TV4 holds a strong position in local TV in Sweden and has actively established relations with newspapers.

TV4's strategy bases itself on the concepts and brands of their TV shows, and translates them into web services, such as games. The target audience is not the same for the web based services as for the TV shows, and TV4's website is therefore quite detached from the other activities of TV4.

One example is the show "Äntligen hemma" (Finally at home) which is a show about home decorating. It has separate editorial staffs for the web service and the TV show. The editorial staff of the web edition cooperates with the newspaper company LRF Media. They create a printed magazine in addition to the web service.

Financial news is another area of cooperation between TV4 and a newspaper. The financial news on television is broadcasted from the office of Dagens Industri, the largest Swedish business newspaper. Dagens Industri has a strong brand and gives credibility to TV4's news program. We will discuss this further in the newspaper case about Dagens Industri. When it comes to the cooperation between TV4 and LRF Media the flow goes backwards: the TV show strengthens the content in the magazine. The second situation is more common, since TV is a strong medium that can help increase interest towards related magazines and newspapers.

During spring 2002, TV4 started a new channel called Mediteve. It is a channel that bases itself on regular TV4 broadcasts, but with a supplementary chat service. The viewers send in contributions to the ongoing discussion on TV screen via SMS, and these contribute to the discussion, which are then broadcasted on the Mediteve channel.

TV4's strategy to cross promote popular brands from TV shows in several publishing channels, treats convergence mainly from a technological perspective. Content from a concept such as a particular TV show can be published on different devices and the users can interact through some of the devices.

## **TV2 – Accustom the users to new media channels in a playful environment**

The strategy of the Norwegian TV channel, TV2 is to strengthen the brand by using it in new media publishing channels. TV2 has tried to introduce their viewers to other channels than their primary channel by letting them play and learn how to use the new channels. To some extent, TV2 also works with personalisation.

One example of this is their Drop service, where already broadcasted material from the morning show is re-edited and then used for a PDA (Portable Digital Assistant) service. The users download the re-edited clips that consist of news, sports and entertainment. The idea for the Drop service was born when the staff of TV2 discovered the possibilities of moving pictures in hand held computers. Hewlett Packard, one of the manufacturers of PDAs, were willing to finance the cooperation as long as it would encourage usage of the PDAs, for something more than electronic calendars. Through this cooperation, TV2 has learned much about the technology and the narrative techniques of this mobile format.

The main purpose of this service was to draw viewers to the evening shows on the regular TV channel. The convergence of technology has made it possible to use PDA's for other purposes than just plain calendars. With the possibilities of downloading moving images to a PDA, the vision of convergence of content between different media channels takes another step forward.

### **THREE CASE STUDIES - NEWSPAPER COMPANIES**

Newspaper publishing companies have a long tradition and much experience regarding the collection, filtering and presentation of information [Jonsson, 2001].

Newspaper companies wish to retain their strong news publishing position in the future. The three Swedish newspapers in the study are all examples of companies working with moving images to secure their positions in new digital publishing channels.

#### **Norrköpings Tidningar – a traditional regional newspaper on its way to become a multi channel publishing house**

Norrköpings Tidningar, NT was founded in 1758 and is the oldest published newspaper in Sweden, which is still in business. The NT group owns several other regional Swedish newspapers and has also chosen to work with moving images, distributed over the web. To acquire the needed competence into their organisation, NT bought a video production company and built a TV studio of their own. Here, interviews with local celebrities were recorded and broadcasted on the website of NT. If broadband becomes more widespread, it could be another distribution form for TV. This is the main belief at NT, and they have therefore chosen the web TV format for working with moving images.

The decision to produce web TV at NT was one step in the NT group's comprehensive strategy to become a local media publishing house. The vision is that NT will keep their strong local position with the aid of synergies from multi channel publishing, despite the growing competition from other media players in the area.

There is a possibility that traditional publishing companies will lose market shares to new competitors in other media publishing channels, for example the TV medium. For many traditional publishing companies, ventures into digital publishing are means of securing all bases [Jonsson, 2001]. This is also the strategy at NT.

The TV studio and the TV activities at NT are financed by commercials recorded in the studio for external customers.

Today, when the staff has acquired experience in producing moving images for the web, it does not take much time to record, produce and launch them on the web site. The editorial content to be published on web TV is decided at the editorial morning meeting. It is mainly a matter of time, which channel the content will be published in,

not the type of content. When a story is produced for web TV, the story is promoted both on the web and in the printed edition of the newspaper.

Working with moving images requires staff that is not afraid of challenges. A newspaper company such as NT, wanting to become a media publishing house and be able to take benefit from the effects from convergence, need to have dedicated and open minded staff.

### **Aftonbladet - The Swedish multi channel pioneer**

The evening paper Aftonbladet has, during the past years, attracted attention because of their move from their second place, to the leading evening newspaper in Sweden. Among the reasons for this was the success of Aftonbladet's website, and also the company's ambition to become a media publishing house, always trying to be first in the new publishing channels.

Through cooperation with the Swedish commercial television channel 5, Aftonbladet is responsible for the production of the text TV pages of the TV channel. Another example of TV related cooperation is between Aftonbladet and Svenska Spel, the Swedish betting and gambling monopoly. Aftonbladet broadcasts a show three times a day consisting of short news intended for the small tobacco and newspaper shops in Sweden that are agents for Svenska Spel.

Aftonbladet also provides some of the Swedish television operators with short news for their Electronic Program Guide services. When Aftonbladet evaluated what they could accomplish with DTV, they decided that portal services were the best option. The portal service can be described as a mixture of text TV and web.

With a starting point in the material on the web, Aftonbladet shortens the articles and adapts them to the portal service, adding pictures, graphics and possibilities to browse the service using the remote control of the TV set.

Except for the established text TV cooperation with channel 5, all of the other TV ventures of Aftonbladet are to be regarded as test projects at this time.

For these kinds of test projects it is important to keep expenses low and to establish revenue sharing with the television operators to finance them. In this manner the expenses are reduced, the newspaper gather knowledge and the operator can offer a new service to their customers.

In line with the changing habits of media consumption, and the decrease in newspaper reading, Aftonbladet wants to establish themselves in new media channels. The belief at Aftonbladet is that they have a strength in established reader communication, through for example poll services on the web. This is something they also want to bring to the TV format. Many of the TV companies work with voting and betting

services using return channels through SMS or the web. This is another example of how different devices can be used in combination to find the most efficient way of interactivity between users and TV companies. The different devices can be used as a complement to each other while waiting for a converged and technically complete solution.

### **Dagens Industri - TV as a complementary service and enhanced information source for the printed edition**

Three years ago, the daily Swedish business newspaper Dagens Industri (DI), started working with TV. In the beginning, only web TV clips were produced, but today Dagens Industri cooperates with TV4 and produces economy news broadcast every day on the TV channel.

The web TV is part of the on-line edition of DI, but is not closed for non-subscribers like the rest of the on-line edition. The web TV content consists mainly of interviews with people of current interest in the Swedish business world. DI produces approximately three interviews a week and some of this material is also broadcast on the TV4 economy news.

The idea of cooperation between TV4 and DI came when TV4 wanted to compete with the financial news of SVT. Due to the regulations for TV and radio broadcasting in Sweden, it is not allowed for a media publisher to promote brands from other media players. The news from DI broadcast on TV4 has to be adapted and the reporters working with TV have to be partly separated from the rest of DI's editorial organisation.

So far, the financing of DI's web TV project has been difficult. The reach is limited and it is therefore difficult to find advertisers. This is a common problem on the small Swedish market and implies that the newspaper company needs strong resources. Some argue that cooperation is not convergence [Ifra, 2002], but cooperation could lead to converging effects within the organisations. One example is the cooperation between DI and TV4 that made it possible for DI to build a TV studio within the premises, and they are, according to the agreement with TV4, free to use it as they like. They can then use material recorded in the studio in other publishing channels to reach their target audience on other publishing platforms than the printed edition.

## **SYNERGIES BETWEEN DIGITAL TV AND NEWSPAPERS**

The three studied newspapers work with TV from two main perspectives:

- Web TV
- Text based TV services

As Sabelström Möller [2001] argues, web TV can be regarded as reference information. This type of information corresponds to people's need to acquire information. Sabelström Möller categorises the habits and behaviour of the viewers of web TV as pull oriented since the viewers actively look for reference information. This makes it a medium well suited for niche content, such as business content in the case of DI.

Text-TV services are text based and since newspapers primarily work with the text format it is a suitable service for newspaper companies. In an age of information overflow, the proven quality of information produced by a newspaper company has a high market value [Jonsson, 2001]. One way to start working with TV is to start with the existing content and adapt it to the TV medium. A first step could be to establish a relation with existing TV companies and in this way acquire more knowledge.

At the moment TV is not a profitable business for the newspaper companies, although as long as there are economic recourses a TV project could bring other positive effects to the company. Presence in a multitude of media channels is also likely to strengthen the brand name of the newspaper publisher [Sabelström Möller, 2001].

## **TECHNOLOGY - PRESENT AND FUTURE**

### **Broadcasting techniques**

For the viewer, the arguments for buying a DTV set top box can be somewhat unclear. The main reason for the operators to convert to DTV is that they can cut distribution costs when broadcasting digitally.

DTV signals originate from the format MPEG-2 and are based on a standard from DVB (Digital Video Broadcast) [DVB, 2003].

DTV signals, just as analogue ones can be subject to disturbance, but they are less sensitive because of the possibility to rebuild missing parts of the signals in the set top boxes. In case of serious disturbance the image disappears completely. Since the DTV signals are less sensitive to disturbance, they can be transmitted with low power. This aspect in combination with the possibility to broadcast a wider range of program services per frequency channel, makes broadcasting DTV signals less expensive than analogue broadcasting.

### **Regional broadcasting**

For all of the three broadcasting forms it is technically viable to broadcast over a specified area, but the interactive possibilities and economical aspects vary depending on the broadcasting form. Regional broadcasting requires, in most cases, that the

signals are encrypted. The decryption in the set top boxes can only be performed if the box has a conditional access function and a smart card.

The main aspect of concern is not one of technology but one of limited reach. Most regional program companies are thus forced to broadcast over several different platforms.

### **Proprietary formats**

The operators in the Swedish DTV arena have invested huge amounts of money in new technology. They use proprietary platforms that have made it possible for the operators to keep hold of the customers and tie them to a certain operator and set top box. In this manner, they have secured their subscription revenues and covered their expenses by creating switching costs.

The use of a uniform standard would make it easier for the content providers to find profitable business models. Multimedia Home Platform (MHP) [MHP, 2003], is a relatively new standard that could replace the currently existing proprietary formats in Sweden, Open TV, Media Highway and Liberate. In Finland, this standard was accepted as the only standard in the Finnish terrestrial DTV broadcasting net [SVT, 2001].

The players in the Swedish DTV market encourage the development of MHP but at the same time the development of television sets with a built in hard drive could be a better solution. An advantage with a hard drive in the TV is the possibility to avoid broadcast specific problems with interactivity, like time delay.

## **INTERACTIVITY**

Interactive TV services allow viewers to interact with what they are watching by ordering or downloading specific information and, in some cases, sending information back through a return channel.

Interactive DTV services can be divided into local or central interactivity. Local interactivity means that the whole service is downloaded to the viewer's set top box and no data are returned after the downloading process. Central interactivity means that the operator also receives information back from the viewer.

If the interactive DTV service is personal and unique from the operator to the viewer, the service is called True Video On Demand. This is an expensive form of interactivity and the operators often instead offer their customers Near Video On Demand. The programs are then broadcasted to all the viewers and decrypted only for those viewers that have paid for the service.

The following list is based on interviews with some of the Swedish DTV operators carried out in spring 2002. The interviewed companies all offered interactive services but at a limited extent. The most common services where:

- Enhanced TV, which makes it possible for the viewers to enter deeply into what they are watching at the moment. The services could be compared to enhanced DVD-productions.
- Super-text-TV, which is a text TV service, complemented with advanced graphics and images.
- Multi camera productions, where the viewer can choose the angle of the camera for example in football games and other sport events.
- EPG, Electronic Program Guide, the most common interactive service offered by the DTV operators. Through the EPG the viewer can get information about upcoming programmes, short news, weather services, games or write e-mail.

The broadcasting process of interactive services is similar to the process of broadcasting analogue text TV. The services are broadcasted at intervals like a merry-go-round and the system in the set top box waits for a specific ID before the downloading process can take place.

It is sometimes impossible, due to the size of the applications, to download entire applications at the same broadcast cycle. Thus the box has to wait until next time the application ID comes up.

The build-up process in the box also contributes to the sometimes irritatingly slow process the user experiences while using digital interactive services or changing channels. The problem could be temporarily solved by placing the service in a separate channel and letting the viewer decide if to download a DTV service connected to a TV show or channel.

A return channel via modem from the set top boxes cut off the analogue viewers from interacting in TV shows, hence until the conversion to DTV is complete, SMS and the web remain the most effective return channels for interactive DTV services [Van Dusseldorp, 2002].

## **DISCUSSION**

The digital broadcasting technology offers a wider range of TV channels than analogue broadcasting technology does, and there are claims that DTV also provides an improved image and sound quality. In addition, DTV offers interactive TV services giving the viewers the opportunity to influence the line of the events of what they are watching. Despite the new possibilities that DTV offers, it has received negative publicity in the media. Much of the negative publicity could be explained by how the viewers' needs and wants have been neglected in the discussion. The operators

introduced DTV to the customers at a much too advanced technical level since the focus was on the DTV technology and not on the needs from the target audience. The step from analogue TV to DTV is not, in it self, revolutionary but even though the conversion could be regarded as a digital revolution changing workflows and rules for the media companies, the technology behind DTV has so far received too much of the attention. The conversion affects in the long run the viewers TV habits and the way they watch TV. When the viewers are able to decide when to watch, when to make a coffee break or download services, the consumers will relate to TV in a new way and thus the revenue models for advertisements will have to change.

Many of the operators own the value chain and control the payment from the customers. In this way they maintain contact with the customers. Controlling the entire value chain could be profitable, but from the interviews with the Swedish television companies and broadcasting operators it is clear that they in the long run believe it to be more important to have an extensive reach than vertical integration.

A theoretical example of cooperation between a newspaper and a TV player could be cooperation between a TV channel and specialized newspaper, e.g. a fishing magazine. The channel could in cooperation with the fishing magazine create a fishing show and both companies could in this manner cross promote each other's brands. However, at the moment the Swedish law does not allow this type of cooperation. It is not legal to expose established brands not belonging to the same organisation.

In Sweden, text TV has not been much exploited but is nevertheless a successful business. With text TV, the viewers get a feeling of topicality. They know the content is constantly updated and this makes text TV a popular service. The impact is great in comparison with the actual effort needed to produce the service. The position of text TV could be even stronger with the DTV technology offering possibilities to use archive functions and high resolution images.

For reporting of regional news, the web TV format is a good choice. For a regional newspaper one suggestion is to find cooperation opportunities with other regional players interested in covering an event with TV broadcasts. For example could the municipality be interested in paying for broadcasts from the municipal council. One idea is that a few regional newspapers jointly cooperate, offering a web site service where they also show web TV. To buy already produced material is also an option.

## **CONCLUSIONS**

The competition in news publishing and in advertising becomes tougher with the increasing range of new distribution forms. TV companies start publishing newspapers, steal advertisers and compete with the newspapers for consumers' time and attention.

It is the authors' opinion that there is a considerable difference between the US and the European TV market. The conclusions in this thesis are based on North European markets with respect to the size of the market, level of available technology, consumption and user behaviour. Within Europe there is a range of technical standards. The approaches to DTV are many and often vary from the rest of the world. One example is the chosen DVB standard for the terrestrial DTV broadcasting net in Europe, which have been chosen in favour of HDTV, a standard currently used in many other countries around the world. Another example is the lack of a uniform standard for the interactive services, which currently means that the most effective return channel for interactive services are SMS and the web.

In Sweden, few regional newspapers have started working with TV. Producing and broadcasting regionally requires economic resources, as well as interested and enthusiastic reporters who believe in regional TV and thus can function as driving forces within the organisation. We will here suggest some ideas on how a newspaper could work with TV:

Cooperation directly with the operators to create text based services such as an EPG service, or other portal services.

Pay-TV services, where the viewers pay to watch the channel or to receive content.

Cross promotion cooperation, where a TV program or a TV channel together with a newspaper promote each other starting from their common content.

Experiment and learn by using organisations and facilities such as Newsplex, a training centre for the development of future journalism and multiple media publishing [Newsplex, 2003].

The text format is ideal for newspapers and is an area that the newspapers control. It would be costly for a newspaper to start a TV channel of their own and it is therefore preferable to cooperate with existing TV players.

For the media publishing companies it is preferable to obtain as much of the customers' time as possible. In an increasingly competitive market, the struggle for customer attention is therefore high.

In time, DTV technology will replace analogue broadcasting. The range of TV channels and services will change and this will mean new possibilities for newspaper companies.

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## Paper III



# **E-PAPER PRODUCTION WORKFLOW – ADAPTING PRODUCTION WORKFLOW PROCESSES FOR DIGITAL NEWSPRINT**

Ester Appelgren\*, Kristina Sabelström Möller\*\*and Stig Nordqvist\*\*\*

Keywords: E-paper, Digital Newsprint, Newspaper Production Workflow, Multiple Channel Publishing

Abstract: This study focuses on production flow for publishing in generic digital newsprint editions, such as e-paper, PDAs or on-line editions, by analyzing and mapping existing production workflow at three Swedish newspaper publishing companies covering the most common organizational types in the newspaper publishing industry today.

Most newspaper publishing companies produce a range of electronic editions, all part of the digital newsprint family. In general, there exists two types of organizational production workflows – the integrated multiple channel workflow, and the separated, where the printed and the electronic workflows are detached, sometimes in totally separate organizations.

Using scenarios, the aim is to propose a model for the production workflow of the electronic paper editions in newspaper publishing. The results indicate several possibilities for automation in the workflow. Furthermore, the study points out stages as challenges in the workflow where changes have to be done in order to introduce e-paper as a publishing channel for news publishing. We will as an introduction, along with the workflow scenarios in this paper, also present a brief overview of the existing techniques for displaying content on electronic paper terminals.

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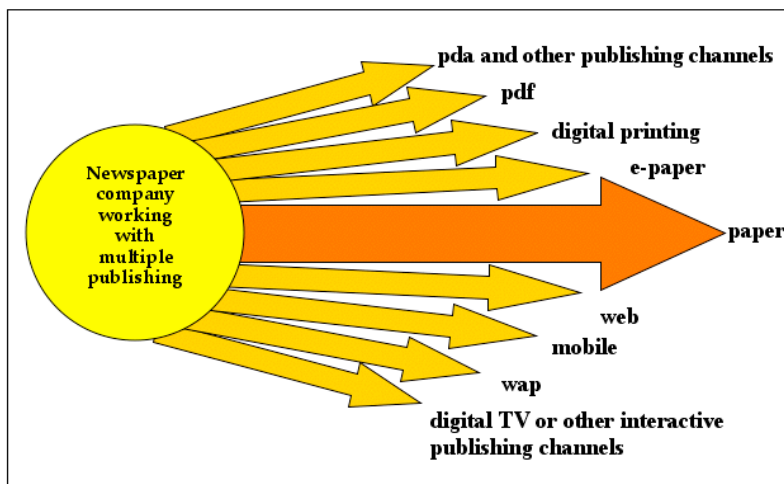
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# INTRODUCTION

## Background

Many newspaper companies produce, in addition to the printed edition, a number of different types of electronic editions, in this paper denoted as digital newsprint. The past few years, many newspaper companies have successfully introduced multiple channel publishing, integrated or separated from the publishing workflow for the printed edition of the newspaper (Sabelström Möller, 2001). As developments in technology are introducing new publishing channels, new business models can be established at the newspaper companies.

In the middle of the 1990:ies, many newspapers ventured into parallel publishing (Sabelström Möller, 2001). Web editions of the newspapers were created and published in parallel with the primary product, the printed edition. As the years have passed, a wide range of different editions from the newspaper companies are now reaching the readers (Figure 1).



*Figure 1: Some examples of the many publishing channels in a multiple channel publishing newspaper company in the year 2004.*

To cut costs, it is preferable that the publishing workflow for the new publishing channels are as automated as possible. This paper aims to find efficient solutions for future newspaper production focusing on digital newsprint, such as an electronic paper edition.

To illustrate possible ways for newspaper companies to produce an edition displayed in an electronic paper terminal we will in this paper present three future scenarios, combined with examples from case studies carried out at three Swedish newspapers.

## **Definitions of terminology**

### *Digital Newsprint*

Digital newsprint is in this paper regarded as a form of digital content distribution of content originally suited for the printed edition. The concept digital newsprint is frequently used by the international newspaper organization, Ifra. The information can be presented using terminals such as PDAs (Portable Document Assistant), e-papers, or most commonly, for digital print with the computer to plate technology (Ifra Special Report 3.36).

The dominating file format on the market for ready-to-print pages sent to the printing plant, today is PDF (Portable Document Format). Since its introduction several years ago, PDF has become the foundation format for digital production workflow management and is increasingly relevant for content management (Löffler, 2003). However, it is not necessary to use this particular format for digital newsprint.

### *E-paper – an extension of traditional paper*

The purpose of electronic paper is to achieve the same characteristics as paper, such as high flexibility, contrast and reflectivity and with the possibility to update the presented content (Ritter, 2003).

Electronic paper, as seen from a newspaper company's point of view, is conceptually a crossbreed between the traditional paper edition and the online edition. It will visually be a paper with the online qualities hidden under the surface. Some prefer to call some of the technologies rewritable paper (Kipphan, 2001) rather than electronic paper, since the content in this type of paper is not consistent over time.

E-paper can be regarded as one kind of digital newsprint, due to the way the content is produced and displayed on the e-paper terminal. The file that has been sent from the newspaper company to the printing plant for print, can be displayed on an e-paper terminal without any changes to the file, provided that the terminals are built in a sufficient size equivalent to the printed edition. The printed version of the newspaper then comes in a digital newsprint format when presented on an e-paper terminal.

There are currently a few different types of e-paper terminals under development in the world. The terminals are portable and designed to consume a minimum amount of electrical power. Some are foldable, while others are in a rigid format, much resembling a cover for a compact disc. In the beginning the e-paper terminals were not designed to display color. Today the most recent terminals support colour as well as moving images. There is a range of different technologies behind the terminals and these technologies will be further discussed in the section called E-paper today.

The services suitable for an e-paper terminal is in this paper referred to as e-paper services or e-paper editions. We will in this paper focus on e-paper services as extensions of printed newspaper editions. However, there is a range of other services suitable to be displayed on an e-paper terminal, such as content from the newspaper's on-line editions, moving images, e-books, calendar-functions, abilities to take notes and store material, possibilities to play sound-files as text-to-speech, to name a few.

As some of the e-paper-terminals support the same kind of services as a PDA, it would technically be possible to display the same kind of functions as of a PDA on an e-paper terminal. Some of the services today presented in mobile phones could also be possible to display on an e-paper terminal.

The users for an e-paper terminal are from the newspaper publisher's point of view the same as the readers of their printed newspaper. The target group for e-paper services will be further discussed in the section called Target groups for e-paper editions.

### *Production workflow*

A production workflow at a newspaper company is in this paper a term for the tasks involved in producing the editions and products in a newspaper company. The production workflow, as described in this paper, starts with the planning of the product and ends with the distribution to the readers.

Recently, when electronic as well as printed editions in some cases have been extended with interactive services, the production workflow can be regarded rather as a loop than a linear flow. However, in this paper, the workflow will not handle interactive aspects and can therefore be regarded as a linear flow, starting in the advertising department and ending in the distribution process.

The production workflows at newspaper companies in the Scandinavian countries are today in most cases fully digital. Leckner (2004), discusses the importance of knowing the limitations of digital technology and its possibilities, in order to grasp the production workflow efficiently. In her opinion, the increasing digitalization creates a demand for knowledge among the employees working in the production workflow in order to produce qualitative output. This is important to consider when expanding the existing workflow at a newspaper company, with yet another digital publishing channel, such as an e-paper edition.

In this paper, the e-paper edition is regarded as one kind of digital newsprint. In the concept of digital newsprint lies that the content is based on the printed edition or uses content from the printed edition as a starting point. The newspaper companies interviewed in this paper demand that the workflow for an e-paper edition should be as automated as possible and be based on the printed edition. The production of an e-paper edition is similar to any digital publishing channel at the newspaper companies,

with the distinction that this edition is going to be based on the printed edition to a greater extent than the other digital editions.

A specific e-paper production workflow would then be specific in the sense that it is not identical to any of the production workflows of the other publishing channels, and in the fully automated case, there is no content exclusively made for this publishing channel.

### *PDF retailers*

There are a number of companies all around the world providing PDF editions of newspapers on websites or in special automates, functioning as automated vending units for newspapers printed on-the-fly. These companies can be described as retailers functioning as a middleman between the newspaper company and the customers specializing in selling copies of newspapers at airports, hotels or on the internet at special newsstand sites. The target group for the newspaper editions provided by the retailers consists mainly of business travellers and people living abroad.

The retailers providing newspaper to be printed out in automates, have several demands toward the newspaper companies, such as size of the PDF-file, number of pages and delivery time from the newspaper. If the PDF file is too large, the retailers cannot offer their customers a short printing time.

For the newspaper companies sending their files to the printing plant in the PDF format, the PDF file to the retailers is often generated automatically as the PDF file for the printed edition is created and transmitted to the printing plant.

## **Methods**

To establish a historical view on e-paper and investigate the meaning of the concept, literature studies have been carried out.

Newspapers are important players in the converging media industry. In this study, we have therefore to a great extent focused on the newspaper industry. To single out synergetic effects between printed newspapers and other publishing channels in the publishing workflow, interviews based on case study models (Yin, 1994) have been carried out at three newspaper companies. The three newspaper companies selected in the study were regional mid-sized newspapers with previous experience from working with PDF editions.

With the aid of scenarios three proposed models for future e-paper content production have been created, based on results from the workflow mappings carried out in the case studies of the production workflow at the newspaper companies. Based on these

three scenarios, a "most likely-scenario" is presented for a future e-paper production workflow.

## **E-PAPER - A MARKET VIEW**

### **E-paper technologies today**

Many of the e-paper terminal solutions of today consists of a screen with electronic ink wrapped in a covering shell. The covers on the prototypes of today can be either bendable or rigid. Furthermore the terminals will contain some sort of computer, memory, batteries and one or several receivers for updating the terminal with content.

There are several solutions for e-paper terminals on the market. However, some of these solutions are based on somewhat the same technologies and originates from three main solutions. All the solutions consist of some sort of grid with tiny cells, forming pixels on a display. The cells are based on different designs depending on the solution and manufacturer.

#### *The solution with tiny capsules containing charged particles*

The first solution consists of a flexible, plastic electronic display entirely made with a process similar to traditional ink-on-paper printing technology. The two american companies behind the solution, Lucent's Bell Labs and E-Ink, claim that their solution uses technology combining the flexibility and portability of paper with the changing display capabilities of a computer screen. This solution's prototypes of e-paper terminals consists of electronic ink and printed plastic circuits. The transistors in these circuits are mechanically flexible, rugged and light weight compared to traditional silicon thin film transistors, and allows updating via computer link.

The electronic ink contains tiny capsules reacting to electrical signals by showing either dark or light pigment. The ink is printed onto a sheet of plastic film, laminated to a layer of circuitry (E-ink, 2002). The grid of plastic transistors forms a pattern of pixels and creates electronic fields causing the electronic ink to change colour and thereby create images (Lucent Technologies, 2000). As seen in figure 2, each microcapsule contains fluid with positively charged white particles and negatively charged black particles. The top of the capsules are visible to the person looking at the display. The image is created when the terminal is charged, then the white particles move to the top and the black particles move to the bottom of the capsule where the electric field is negative. Where the positive field is applied the opposite reaction occurs.

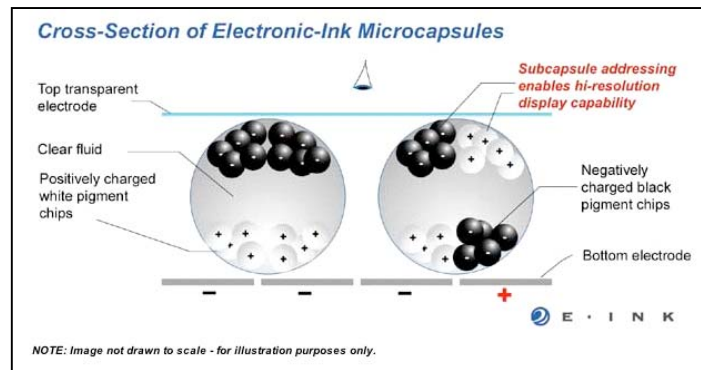


Figure 2: Description of E-Ink's Electronic-Ink Microcapsules, Copyright E-Ink (2002).

The electronic ink enables brightness, viewing from all angles, low power consumption and plastic film constructions. The contrast ratio between white and black of the prototypes are according to a press release from Lucent Technologies (2000) approximately 10 to 1, compared to that of traditional newspaper with to 8 to 1. This solution only needs power during each switching cycle as a new image is displayed, and Lucent Technologies claim that the first presented prototype draws one-tenth to one thousandth of the power of an LCD of equivalent size.

Another solution involving E Ink is a joint solution between Philips, Sony, Toppan Printing and E Ink (Figure 3) and is by E Ink described as the world's first electronic paper display in Sony's e-Book reader. It will be launched in Japan in April 2004, and is said to offer a reading experience with contrast that is the same as newsprint (E Ink, 2004). The device has a resolution of approximately 170 pixels per inch, which according to E Ink is the same resolution as for a traditional newspaper. Similar to the Lucent/E Ink product discussed previously in this chapter.



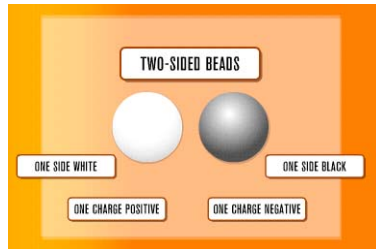
Figure 3: Sony LIBRIé e-Book Reader.

E Ink supplies electronic ink for this product. Toppan Printing process the ink into a thin optical film and Philips adds the driving electronics component. The solution has then been adopted in the Sony e-Book reader "LIBRIé". This reader device has the same size and design as a paperback book and displays four shades of grey (E Ink, 2004). The solution is however rigid and therefore not paper-like, due to the glass backings and cannot therefore be bent (Walker, 2004).

### *The two-colored beads solution*

The second solution to be discussed in this paper has been invented by the american company Gyricon and is called SmartPaper. The solution consists of two sheets of thin plastic where tiny bichromal beads are embedded in between (Gyricon, 2004).

According to Gyri-con, one side of each bead is negatively charged while the other is positively charged. The positive side have a different color than the negative side and under the influence of voltage applied to the surface, they rotate depending on the charge of the electric field, thus presenting an image to the viewer (Figure 4). When a positive charge is applied, the bead turns to display the black half. The white side comes up when a negative charge is applied (Sidener, 2004).

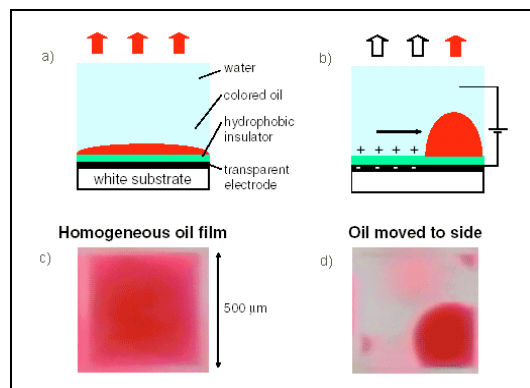


*Figure 4: Gyricon's two sided beads (Gyricon, 2004)*

Similar to the earlier presented solutions, this image remains until a new voltage is applied. The terminal can be updated via wireless radio signals or from a computer (Walker, 2004).

### *The oil and water solution*

The third solution is based on the electro-wetting technology. The technology uses oil and water in tiny cells, forming a surface.



*Figure 5: Electrowetting display principle, Philips (2004).*

When an electric charge is applied, the oil is temporarily pushed away by the water and the background colour is thus displayed. As seen in figure 5, when no charge is applied across an hydrophobic insulator, oil covers the surface and nothing is displayed of the white substrate. The lowest energy in the system is achieved when water is in contact with the insulator. As a charge is applied, the surface becomes temporarily possible to wet, and the water therefore pushes the oil to the side (Philips, 2004).

The electro-wetting technology enables use of color when combined with two independently controllable colored oil films and a color filter. The colors used are cyan, magenta and yellow (The Hindu, 2003). However, this solution is still in an early laboratory stage.

#### *Other solutions*

There are other solutions for electronic paper terminals as well, for example from IBM and Acreo. These two solutions are bendable with color displays and will not be discussed here in detail.

The Swedish based company Acreo has developed an e-paper solution called Paella. It consists of color-changeable inks included in thin or thick film, combined with electronic devices on paper (Acreo, 2004). The electronic ink produced by Acreo needs according to the company, less power than the competing solutions by E Ink (Larsson, 2000). The solution by IBM is a bendable computer display resembling traditional paper. Rival technologies by SiPix, Fujitsu, Siemens and Ntera are under development. All these solutions are based on the concept of fluid crystals (Perkin, 2004).

#### **Updating e-paper terminals**

Since the technologies for e-paper are under development there are currently several solutions for updating the terminal. The terminals could be updated via various IP services, via 3G, DVB (Digital Video Broadcasting) or as suggested in the DigiNews project (Bouffieux, 2003), via DAB (Digital Audio Broadcasting) or W-LAN hotspots.

IP services, W-LAN hotspots and in some cases DVB as well as the 3G technology make interactive services possible in the e-paper terminals. DAB broadcast channels are mainly used for broadcasting radio signals for digital radio receivers, and have additional frequency space for data, such as a future transmission of e-paper editions.

DAB is not an interactive distribution form, but covers large regions and can reach a large number of users with low transmission costs. W-LAN hotspots can offer additional interactive services. The DigiNews project suggest combined use of different technologies for e-newspaper distribution.

An e-paper terminal could be compared to other mobile digital terminals be similar to a PDA in terms of mobility. In the beginning the terminals will be small, not larger than a A5 page (148x210 mm). The first prototypes was made in the european ISO standard A5 format and smaller, but the size is promised by the manufacturers to increase with the development of the terminals.

### **User reactions to e-paper terminals**

How the general public will react to an e-paper edition and the terminal is hard to predict. According to market research conducted by the e-paper terminal manufacturer Philips, and the Swedish newspaper *Sydsvenska Dagbladet*, carried out during November 2003, the general opinion was positive.

The results however indicate that the users regard an e-paper terminal with possibilities to read the newspaper as yet another gadget with not much new to offer. On the bright side, the Swedish users considered the low power usage in e-paper terminal to be almost too good to be true, and wish that the reader would have a large storage capacity so that it will be possible to download several different newspapers throughout the day. They also found it useful when travelling abroad. The downloading process was something the Swedish users was concerned about.

Compared to traditional newspapers, the users thought that an e-paper edition would imply new ways of reading the newspaper. Compared to a laptop, the e-paper terminal would be more portable, and compared to a PDA, the reading experience would be better on an e-paper terminal. (Liljestrand, 2003)

## **E-PAPER AS A NEW PUBLISHING CHANNEL**

### **Scenarios**

We will in this paper present three possible ways for newspaper companies to work with an e-paper edition. These suggested solutions are presented in the form of scenarios and are followed by examples from the case studies carried out at three Swedish newspaper companies in the autumn of 2003. They could also be valid for other types of digital publishing channels.

The first scenario illustrates a fully automated workflow. Secondly, we will give the other extreme with editors working full time with an e-paper edition and creating a new edition from scratch, every day. In the third scenario, the e-paper edition is created on the fly, whenever the reader sends a request for it.

The scenarios are created with respect to existing technology and editorial systems at the newspaper companies. In the best of worlds the entire collection, storage, and refinement of the editorial and advertising material would be stored in standard

formats and tagged with metadata. Thus, the editorial as well as advertising material, would be compatible and possible to publish in all digital publishing channels at the newspaper companies. Unfortunately, as of today this is not entirely the case.

### **Case studies**

The studied newspaper companies were Göteborgs-Posten (GP), Östgöta Correspondenten (Corren) and Nerikes Allehanda (NA).

Göteborgs-Posten (GP) is the second largest morning newspaper in Sweden (TS, 2004). The strategy at this western Swedish newspaper is to use the web as a complimentary publishing channel supporting the printed edition. The aim is to make GP the natural information channel for the people living in the western part of Sweden, regardless of the desired publishing channel. The strategy for a future e-paper edition is to use this publishing channel for subscribers living in sparsely populated areas or abroad. A future e-paper edition at GP would be identical to the printed edition regarding published material.

Östgöta Correspondenten (Corren) is the largest newspaper in the area of Östergötland and the fourth largest regional daily newspaper in Sweden (TS, 2004). The strategy of Corren, is freely translated: "to collect, refine and distribute media content with the aim to influence, make life easier and add brilliance to the people living and working in Östergötland and to assure the advertisers that they can reach their market and make a result" (Annual Report Corren, 2002). Corren is working closely with the University of Linköping and has initiated several research projects where the newspaper company functions as a test bed for the projects. The strategy for a future e-paper edition could be to especially include material suitable for the format, such as pictures of new born babies and interactive advertisements.

The third company, the regional daily newspaper Nerikes Allehanda (NA) is the third largest regional daily newspaper in Sweden (TS, 2004). However, it reaches 82 percent of the population living in the county of Örebro in the middle of southern Sweden (Annual Report NA, 2002). The strategy for a future e-paper edition is that it should be an extension of the on-line edition.

### **The production workflow at the studied newspapers**

The two extremes of organizational production workflows are the integrated multiple channel workflow, and the separated, where the printed and the electronic editions are produced in totally separate organizations. At the studied newspapers the organizational production workflows are somewhere in between the two extremes as the electronic editions are partly separated from the workflow of the primary product, the printed edition. At these newspaper companies, content from the printed edition is

often published on the web after it has been published in print, while content made for the on-line edition is not as often published in the printed edition.

The selection of material for the desired publishing channel is made manually and the belief is that this step should always be manual.

The editorial department is responsible for "pressing the button" to send the page to the printing plant, as soon as a page is ready for print. The pages are stored in a database and in the archive of the newspaper. As the pages pass the OPI (Open Prepress Interface), the postscript conversion to the PDF files and the RIP (Raster Image Processor) the responsibility belongs to the IT department. The pages ready for print are then sent to the printing plant as compressed files.

The advertising department uses a planning tool, often not compatible with the production system of the editorial department. In order to determine the number of pages of the printed edition, there is an ongoing dialogue between the advertising and the editorial department. For the electronic editions such as the online edition, the advertisement spaces are fixed and the number of advertisements usually does not vary.

A page shared between both departments is in general first layouted by the advertising department, stored as one unit and later assembled by the editorial department as if the advertisements were images. The department responsible for advertisements is also usually responsible for the transmission of full page advertisements to the printing plants. This transmission takes place during the day while the editorial pages of the newspaper are transmitted by the technical editors during the evening.

Many newspaper companies send the pages to the printing plants in the PDF format. Copies of these PDF pages are also stored and downscaled for later publication in a PDF-edition on the website of the newspaper or in other forms.

### **Scenario 1 – The automated production workflow for future e-paper editions**

An e-paper edition is yet another edition to produce, requiring resources such as money and time for the newspaper companies. It is therefore preferable if the production workflow of the e-paper edition could be as automated as possible. In the automated scenario (Figure 6), after initial work to set up the workflow, no further manual editing will be needed. A prerequisite for this scenario is that the layout issues and valuation of news can be solved automatically.

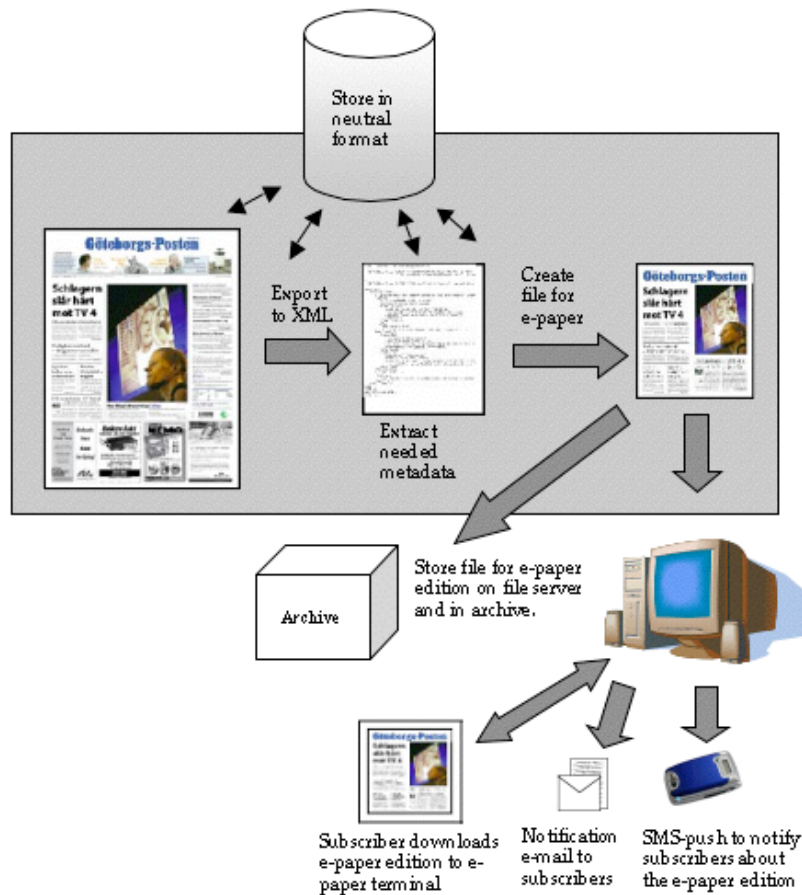


Figure 6: The automated e-paper production workflow.

The starting point for this scenario, as seen in figure 6, is the printed edition. The stored composite file is exported to XML format (eXtensive Markup Language). From the tagged data it is possible to extract information such as where the different elements are placed on the page, and the type and level of the material.

This information is used to categorize the material and convert it through an automated scaling and re-editing process into material suited for the e-paper edition. The material is placed according to a template created for the e-paper edition and then saved as a file in a suitable format, such as PDF or JPEG (Joint Photographic Experts Group). The file is then stored on a file server and in the archive of the newspaper company.

The small arrows in figure 6, from the database to the different stages in the process, indicates that the material is referred to as links in the files. When the composite file is ready for publication, the links are replaced with the actual text, images and graphics. The file can then be stored on the file server for distribution to the readers.

When the file is ready for downloading, the readers are notified either via a text message to the reader's mobile phone or by e-mail. The readers can then start the downloading process of the e-paper edition to their e-paper terminals.

The two-way arrow between the file server and the e-paper terminal indicates that with a distribution form such as broadcast via DAB, the arrow is toward the terminal from the file server. If the edition is downloaded through IP services, the arrow needs to be two-way, since some sort of communication from the reader to the newspaper is needed in order to initiate the downloading process.

An e-paper edition could be compared to the PDF-editions available for download at the newspapers websites today. At Nerikes Allehanda, (NA) a PDF-edition of the morning newspaper is each day available at the website of NA. With the existing PDF-production workflow, it is possible to scale down the text, but not the images. This is a minor problem compared to scaling of advertisements that might be non scalable.

NA is not cooperating with any PDF-edition retailers. They do not believe in a retailer on the net functioning as a middleman, since they want to be the strongest channel of communication in their region.

### **Scenario 2 – The e-paper product as a new re-edited edition**

The newspaper company has in this scenario chosen to dedicate resources to the e-paper edition and treat it as a stand-alone product, using re-edited material from the existing content newsflow at the newspaper company (Figure 7). The reason for choosing this scenario could be that the existing production workflow cannot easily be adapted to an automated process or as a strategic move for the future, if the e-paper edition is to become a successful edition.

In this scenario, an editor selects and re-edits material from the already printed edition. To save time and make the editing time more efficient, the editor uses a template especially made for the e-paper edition and creates a composite file, later converted to the chosen e-paper terminal format. The converted and ready to distribute file is then stored on a file server for downloading by the readers. A copy of the edition is also stored in the newspaper company's archive. Similar to the first scenario, the readers are notified by e-mail or SMS (Short Message Service on mobile telephones) when the e-paper edition is ready for downloading.

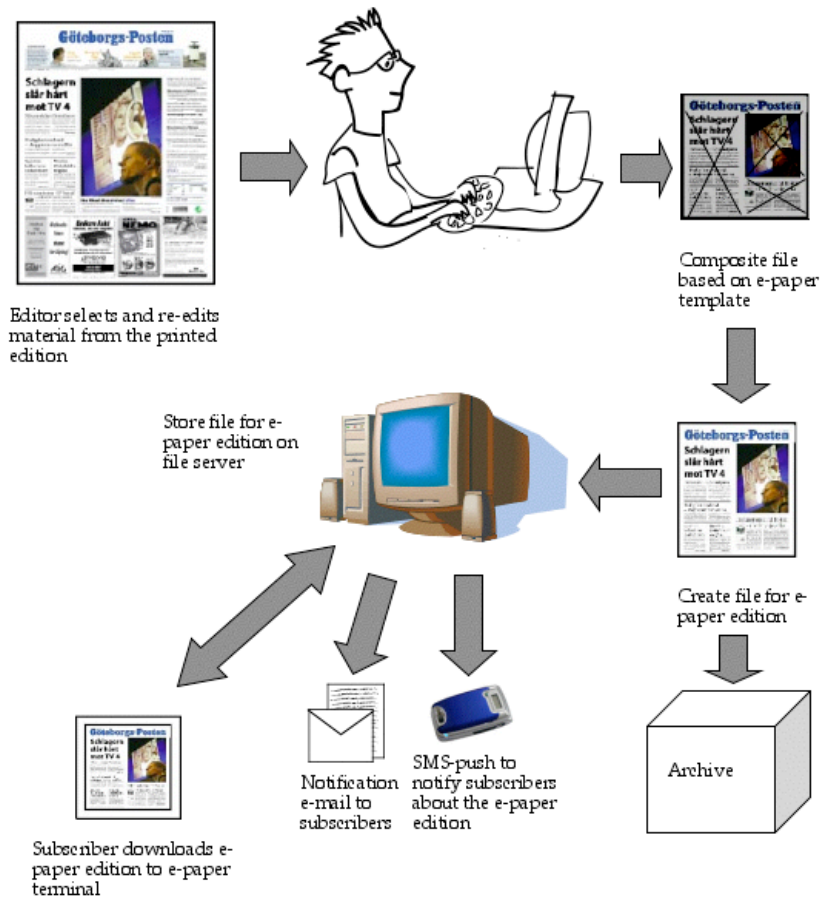


Figure 7: The e-paper product as a new re-edited edition.

This scenario was tested at Göteborgs-Posten (GP) in the autumn of 2001. A two weeks experiment was performed, called mini-GP. The mini-GP was a re-edited edition of the printed edition in form of a PDF-file in A4 format with a 10 mm bounding border. It was tested on a group of 100 test users consisting of Swedes living abroad. In order to produce the mini-GP, two people were working full-time, re-editing the articles to fit the mini-GP layout. A full automation of the mini-GP would have been a difficult task to perform, mainly due to the existing editorial production system.

The mini-GP edition consisted of what was regarded to be the most important articles, mainly domestic news from the printed edition and news from the Swedish news agency, called TT news. Regional news and economy news were also included and there was a permanent space for the stock market and exchange rates. The last page

had a weather section and selected news from the sports and culture sections of the printed edition.

All the pages were template-based, the images had to be in TIFF format (Tagged Image File Format) and graphics could not be larger than 2MB. The pages were made in Quark Xpress and converted into PDF pages with Acrobat Distiller 3.0. To reach the subscribers living abroad with the mini-GP, a personalized e-mail was sent out, with a link to the website where the mini-GP could be downloaded from.

A survey was carried out among the hundred test users of the mini-GP. Many of the answers were positive, especially regarding the possibility of subscribing to the mini version of GP without subscribing to the printed edition. There were only a few minor problems in the production workflow for the mini-GP, such as resolution problems with the weather map.

The re-editing process requiring editors to work full-time was not economically viable for GP, due to the small market regarding target group and production costs for this kind of product.

### Scenario 3 – The dynamically updated e-paper edition

In the third scenario, the e-paper edition is created on the fly, on request from the reader (Figure 8).

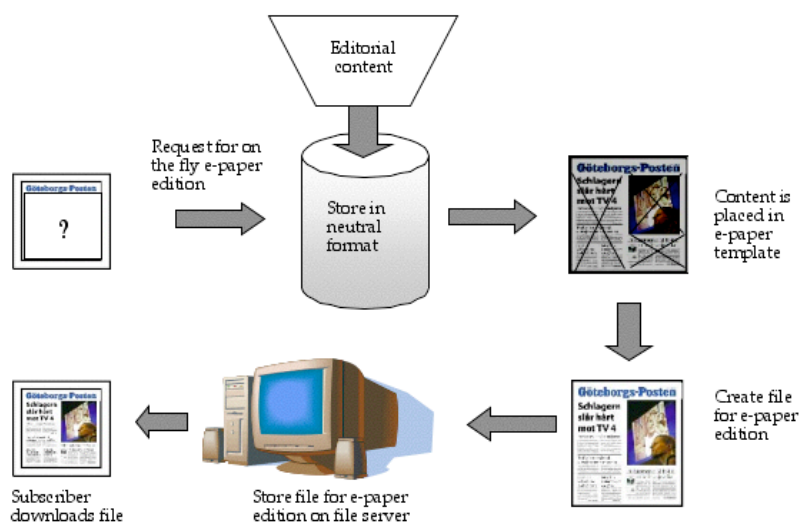


Figure 8: The dynamically updated e-paper edition

When the reader wishes to download the e-paper edition, a request is sent to the newspaper. The available content suitable for the e-paper edition is then selected through an automated process and the content is placed in an e-paper template. Unlike scenario one, the content is not bound to be taken from the already-printed edition. The composite file based on the template is converted into the e-paper format and saved on a file server before being distributed to the reader's e-paper terminal.

This scenario requires a large degree of automation. Furthermore, the material has to be stored in standard formats. The images, graphics and other elements associated with the different articles, need to be linked to the article either through common document names or using metadata tags.

This scenario is somewhat more similar to publishing of an on-line edition of a newspaper than to publishing of the printed edition, since the e-paper edition in this case is updated continuously throughout the day. This is in line with how NA sees a future e-paper product. According to NA, the e-paper edition should not be regarded as an extension of the printed edition, but as an extension of the on-line edition.

## **DISCUSSION**

### **Advantages of an e-paper product**

The significant difference between traditional paper and electronic paper is the electronic version's ability to be updated. Depending on the available distribution net, the electronic paper terminal could be updated whenever there is an important event in the news world, either automatically via the DAB (Digital Audio Broadcasting) net or on demand using IP (Internet Protocol) services, mobile telephone nets or digital TV.

For newspaper and magazine publishers, the transformation from mechanical printing presses and pulp paper to digital print media offers numerous opportunities to create and profit from a wealth of new product and services [Fidler, 1997]. A future e-paper terminal and service could, if the proper technology is built into the product, offer possibilities of interactive advertisements. The readers of the e-paper edition will most likely be registered users in the subscription database of the newspaper, and therefore known to the newspaper company. Thus, through the identification and downloading process, registrations and filling in forms with contact data in e-paper advertisements will already have been taken care of. This would make it easier to implement e-commerce applications and should be interesting for the advertisers.

With an e-paper edition for a newspaper company, zoning could be possible as digital technology can achieve closer alignment of advertisements to reader profiles. Digital newsprint enhances the possibilities of advertising for remote applications, but such models are not yet developed (Löffler, 2003). Examples of how this could be achieved could be personalized advertisements in an e-paper edition, based on geographical

location or dependent on the registered user's personal profile. Personalization of content could also be accomplished through active choices from the readers.

Parts of the newspaper content can in an e-paper edition consist of moving images. This gives the e-paper edition an enhanced way of presenting the news compared to the printed edition.

Newspaper companies have, with their printed edition, created a close relationship with their readers. In the online world, the readers are not as loyal to their newspaper. Through their online editions, the newspaper companies no longer have the privileged relationship with readers, and thus with advertisers, that was the foundation of their success in the offline world [Sparks, 2000]. An e-paper edition could, however, be regarded as a crossbreed between an online edition and a printed edition, with the advantages of an electronic edition, the workflow much similar to the digital newsprint workflow, and at the same time with an exclusive relationship between reader and newspaper publisher.

### **Target groups for e-paper editions**

An important aspect when sketching the outlines for a future e-paper edition is the target group for the product. From the interviews with newspaper companies carried out in the autumn of 2003, we can draw the conclusions that the target group for a Swedish e-paper edition might consist of several subgroups. They could be described as follows:

- Persons living abroad.
- People living in sparsely populated areas, difficult to reach with the existing distribution system for the printed edition of the newspaper.
- Roaming readers, such as businessmen and other people who travel extensively.
- People preferring to read an on-line edition of the newspaper, rather than the printed edition.

Swedes living abroad are frequent visitors to websites of their native hometown newspapers. This target group cannot be reached through the ordinary subscription system and a special service such as an e-paper edition could be a way to charge these readers for the content they are interested in. If offered a special version of the printed edition, tailored especially for them, the loyalty towards the newspaper among these readers might be increased.

Distribution of the printed edition to sparsely populated areas, such as woodland or archipelago areas are costly for the newspaper companies. According to Rehn (2001) the distribution process of the printed edition is a major expense for the newspaper companies. In some cases, it would be economically preferable to offer readers living in sparsely populated areas a subscription to a competing newspaper than to provide distribution covering these rural areas. An e-paper edition could offer an alternative for these customers; assuming that they are living in an area covered by the Internet

broadband net or other digital distribution nets, it would be possible to distribute the newspaper electronically. Unfortunately, rural areas in Sweden are often not reached by broadband today.

PDF-retailers around the world in combination with the newspaper's online editions reach a part of the roaming readers. An e-paper edition could compared to the on-line edition be a way for the newspaper companies to maintain control of the entire value chain, and in this manner, remain in contact with their readers by skipping the middleman or the anonymity of the readers for the online edition.

As discussed in Wesslau et al. (2002) readers may prefer to read news from the online edition of a newspaper rather than the printed edition. For certain target groups, the brand of the printed edition can for example be associated with political values, while the on-line edition is not. An e-paper edition might not be affected by these subjective values and could reach other target groups than that of the printed edition.

### **Challenges for e-paper content production**

From discussions with the studied newspaper companies it has become clear that there are several functions in the current production workflows in need of adjustments before an e-paper edition could be introduced in the production workflow. The most important questions are:

- Selection of material suitable for the product
- Automated scaling of editorial and advertisement material
- Handling of high resolution graphics, such as advertisements or weather maps
- Pagination
- Copyright issues
- Editioned pages
- Layout aspects
- Human resources
- Distribution
- Promotion of the e-paper edition

#### *Selection of material suitable for the product*

The interviewed newspaper companies does not want to create unique content for an e-paper edition. At an early stage they prefer to use material from the already printed edition in combination with material from the online edition. The challenge is to automate the selection to a great extent.

### *Automated scaling of editorial and advertisement material*

In order to handle scaling of images, text and advertisements it is important to store the material in a neutral file format with the aid of uniform metadata standards. A common standard for metadata tagging is XML. It is by Quinn (2002) described as the building blocks which makes convergence journalism possible. Convergence journalism would in this context mean that editorial material is collected and stored for later use in any of the publishing channels of the newspaper. The metadata should be applied to the material automatically in the collection and storing process in order to more easily keep track of different versions edited for the various editions within the newspaper company (Sabelström Möller, 2003).

### *Handling of high resolution graphics, such as advertisements or weather maps*

Advertisements and high-resolution graphics such as weather maps may not be easy to adapt automatically to an e-paper edition. Further research in advertisement file format and planning is needed in order to determine how the handling of advertisements and graphics should be performed.

### *Pagination and copyright*

Pagination could be a problem in a future e-paper edition. An example can be found in the case of the PDF edition at GP, which contains less pages than the printed edition, due to copyright regulations concerning certain parts of the newspaper, such as comics. The copyright issues have so far in the case of GP and their PDF-editions, been avoided by excluding the pages that might cause problems.

### *Editioned pages*

If the newspaper company produces several geographically tailored editions, the most suitable edition for each target group needs to be selected for the e-paper edition. As of today this has to be done due to logistical and economical reasons. In PDF editions, the problem with different geographical editions is often avoided by excluding editioned pages.

### *Layout aspects*

It might not be necessary to include the entire printed edition in an e-paper edition. What is included depends on the target group for the service. The placements of advertisements and editorial material could be pre-booked in the layout for the e-paper product. If the included material in the pre-booked story does not fit in the assigned area, a notice could be sent to the editor working on the e-paper edition, who then has to make changes such as shortening the story.

Many of the articles are connected to specific advertisements when it comes to layout and structure. If these connections are dissolved, the value of the advertisement could be lost.

#### *Human resources*

For the editorial staff, reorganizations take time to be accepted. Changes have to be introduced gradually to avoid turbulent reactions from the staff. Technology has to have a subordinate position in these changes and the editorial staff should not have to worry about the technical production workflow (Sabelström Möller, 2001).

#### *Distribution*

One problem is that a target groups such as people living in sparsely populated areas or Swedes living abroad might not be among the early adopters of technology and might not be reached by the broadband net.

If these problems were to be solved by for example the development of 3G (third generation wireless mobile technology) mobile or digital TV broadcasting nets, further research should investigate the readers willingness to read their morning newspaper in the suggested small sized e-paper terminal format.

#### *Promotion of the e-paper edition*

The advertising department at the newspaper company should not neglect a future e-paper edition. In the case of PDF editions, they are often hard to find on the website of the newspaper and few advertisements have been sold exclusively for the PDF-edition.

#### *Business models and the future audience*

E-paper editions could give rise to new business models and advertisement formats. They could, for example, include interactive advertisements. Registration issues in the advertisements could easily be solved since the newspaper already knows the user through the downloading process.

#### **Most likely scenario**

To conclude, the findings in this paper is here presented as a "most likely" scenario (Figure 9), based on the above presented scenarios. A future e-paper edition of a newspaper, could be placed somewhere in between services made for mobile phones by the newspaper companies and the printed edition. In the beginning, a new

publishing channel will be expensive, especially in relation to the size of its audience. To cut costs it is preferable to use the same material in several publishing channels. Therefore the most preferable scenario would be the first presented scenario in this paper.

However, to automate the entire production workflow is a difficult task. The problem to automate the workflow is avoided in the second scenario, where an editor works fulltime with the e-paper edition. This scenario could be costly for the newspaper companies. The "most likely" scenario consists of a little of both, a certain amount of editing as well as automation.

Since the e-paper edition in this paper is regarded as a digital newsprint publishing channel with many similarities to a PDF-edition, the starting point for this scenario is the printed edition. As in the case of the first scenario, as much data as possible is extracted from the existing printed edition composite file and imported into a composite file based on an e-paper edition template.

Very few are the editors willing to allow an e-paper edition to be produced in a completely automated manner without any proof reading. In the "most-likely"-scenario, an editor works on the e-paper edition composite file, makes corrections, re-edits and updates the edition with the most recent news. The editor can also update the e-paper edition with news presented in the online edition.

The workflow is in this scenario automated to a great extent, but the final product is finalized by an editor. The editor creates new editions a few times during the day. The editions are stored on a file server and in the archive, and the readers are notified whenever a new edition is available for downloading. This scenario is also possible to extend with some of the qualities of the third scenario presented in this paper, such as on demand possibilities to download the e-paper edition whenever a reader wishes to read the latest edited version in his or her e-paper terminal.

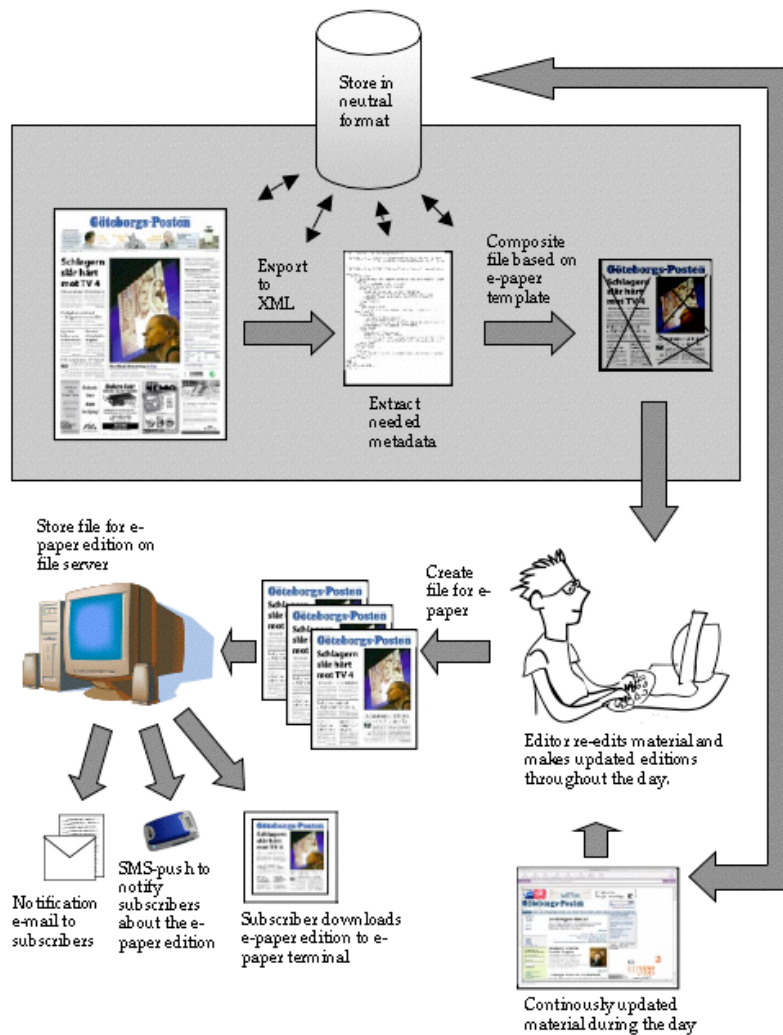


Figure 9: A "most-likely-scenario", both editing and automation

### Will the e-paper edition replace the printed edition?

When the online edition was introduced as a new publishing channel at the newspaper companies, it was initially regarded as a threat to the printed edition. Maybe one of the biggest threats the newspaper companies ever have had to face (Fischerström, 2002).

New digital publishing channels as shown in figure 1, have successfully been introduced at the newspaper companies. The competition in news publishing and in advertising becomes tougher with the increasing range of new distribution forms

(Appelgren, 2003). Many of these new channels have initially been discussed as possible threats to the primary printed newspaper edition. When electronic editions were first introduced at newspaper companies, they were more often regarded as technological experiments than as new publishing channels and revenue sources (Sabelström Möller, 2003). Depending on the strategy, the different electronic editions have been presented as complements to the printed edition and thereby not been regarded as threatening.

According to Svensson (1998) in a larger perspective, people will however, abandon the printed edition. If a medium is faster, costs less to buy, and is possible to personalize it will win over other less developed media publishing channels.

We have in this paper presented some of the existing techniques for e-paper terminals today. Traditional paper might not have all the characteristics of an electronic edition such as an e-paper edition or news presented on a PDA, but it has many characteristics that will be difficult for the creators of electronic paper or other electronic publishing channel terminals to achieve. E.g., paper does not need power, it is inexpensive and it is extremely portable. The e-paper terminal prototypes of today are still expensive and the power supply is a difficult issue. The portability can to some extent resemble that of traditional paper, but if the product is expensive, people will not use it in the same way as a paper product. According to market research carried out in Sweden in 2003, readers of traditional newspapers did not think that an e-paper edition could replace the printed newspaper. They considered it impossible to replace the feeling of reading from a traditional newspaper and found an e-paper edition impractical for a family, since it is not possible to share in the same way as a newspaper printed on paper (Liljestrand, 2003).

The scenarios presented in this paper are based on technology and organizational structures of today. This structure is here reflected in the "most likely" scenario as a production workflow possible to implement in a Swedish newspaper organization, it might not however be the most efficient solution for production of an e-paper edition if the edition is made for a larger target group than that of citizens living abroad and readers living in sparsely populated areas. The third scenario, presented in this paper lies somewhat in the future and can be seen as the following step after an e-paper edition workflow has been successfully implemented and tested at a newspaper company.

Some of the challenges to overcome when introducing an e-paper edition have been presented in this paper. We have found that depending on the desired level of automation in the e-paper edition production workflow, the most difficult challenge is to solve the conversion and scaling of advertisements, regardless of their initial format. In order to produce an e-paper edition the challenges presented in this paper needs to be solved either in-house at the newspaper companies or by investing in one of the editorial systems supporting the production of e-paper editions.

Perkin (2004) suggests that e-paper will imply that publishers need to consider how e-paper, like all electronically transmitted media, opens up their market to competition, lowering the barriers to entry. For the media publishing companies it is preferable to obtain as much of the customers' time as possible. In an increasingly competitive market, the struggle for customer attention is therefore high (Appelgren, 2003). If a large number of readers adopted e-paper, news publishers would be even more reliant on their editorial quality, brand and reader loyalty than they are now. Furthermore, there will be huge ramifications for how newspaper production is organized especially considering the potential that e-paper in a longer time perspective could replace print (Perkin, 2004).

It is likely that the e-paper editions will start off in the same way as the other electronic editions in the digital newsprint family. However, the e-paper products could in a near future, if not a threat to the printed edition, be a complement to traditional paper, displaying the content of the newspaper with the qualities of the printed edition together with the on-line specialties and functionalities.

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