

Evaluating Digital TV as a Publishing Channel for Newspapers

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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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LITERATURE CITED

- Flynn, B.
2000 "Digital TV, Internet & Mobile Convergence – developments and projections for Europe" (Phillips Global Media Management Reports, Phillips Global Media)
- Hvitfelt, H.
1999 "Efter journalistiken? Om medier och journalistik i förändring" in U. Carlsson (ed.) "Professorer i journalistik och medie- & kommunikationsvetenskap reflekterar, Medierna i samhället. Kontinuitet och förändring" (Nordicom), p 44.
- Ifra
2002 "Video in Print, A Survey of Newspapers and Multimedia Newshandling" (Ifra Special Report 2.34, Darmstadt)
- Jonsson, A.
2001 "Enhancing on-line information sharing systems" (NADA/Media technology & Graphic Arts, The Royal Institute of Technology, KTH, Stockholm)
- Lindskog, T.
1998 "INTERNET som den FÖRLÄNGDA TIDNINGEN" (Tidningsutgivarna, Sverige)
2003 "Turun Sanomat – Med redaktionell integrering som ledstjärna" (TDM-Rapport nr 4-2003, Teknik och Digitala Medier, Tidningsutgivarna, Sverige)
- Magnusson, P.
2003 "Publikundersökningar över digital TV" (Royal Institute of Technology, Stockholm)
- Sabelström Möller, K.
2001 "Information categories and editorial processes in multiple channel publishing" (NADA/Media technology & Graphic Arts, The Royal Institute of Technology, KTH, Stockholm)
- SVT
2001 "Årsredovisning 2001" (Sveriges Television, Stockholm, Sweden)

- Södergård, C. (ed.)
 2001 “Integrated news publishing – Technology and user experiences”
 (Report of the IMU2 project, VTT Information Technology, Espoo,
 Finland)
- Van Dusseldorp and Partners
 2002 “SMS-TV – interactive TV Reinvented”, (Van Dusseldorp &
 Partners, Amsterdam, Netherlands)
- Quinn, S.
 2002 Knowledge Management in the Digital Newsroom”
 (Focal Press, Oxford)

Newsletters and articles:

- The Economist
 2002 “Power in your hand – a survey of television” April 13th 2003,
 The Economist.
- Pay TV & Satellite News
 2002 “Sky Reaches Profitability, Growth in Subscribers and take up of
 new services”, www.broadbandbananas.com, 2002-11-14

Web sites:

- DVB
 2003 Digital Video Broadcasting Home,
www.dvb.org, 2003-03-26
- MHP
 2003 DVB – MHP Home,
www.mhp.org, 2003-03-26
- NewsPlex
 2003 Welcome to NewsPlex,
www.newsplex.org, 2003-03-26