DIGITAL INNOVATION IN THE VALUE NETWORKS OF NEWSPAPERS

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DOCTORAL DISSERTATION
ABSTRACT

After decades of digital developments, we are now entering a truly digital era. Digital information and communication technology has become a naturally embedded part of the designed environment we live in. Most parts of life are today pervaded by digital products and services. Evidence of such immersion can be noted in, for instance, media consumption. This development is gradually shaping and cultivating a media environment that is ubiquitous. Such ubiquity is manifested in media’s constant presence and the changes in media consumption in the purview of digital innovation. Indeed, digital innovation is not only a shift in technology. It alters existing value networks and calls for rethinking existing value perceptions. While this disruptive change driven by digitization can be found in many industries, this thesis focuses on its impact on value networks in the newspaper industry.

The digitization of newspapers started with the introduction of the internet in the 90’s and soon emerged into new media innovations. While these new media innovations have not replaced existing media, they have been disruptive to newspaper value networks. Recently, the emergence of yet another digital innovation is specifically interesting when studying changes to value networks of the newspaper industry: the e-paper. This innovation (a screen technology very close to print on paper) exhibits inherent values that make future replacement of print on paper a possibility. It is therefore regarded as a very promising technology in the newspaper industry.

This thesis can be positioned at the intersection of the friction between forces to embark on a new media trajectory and forces to hang on to the established structures and control. The research question addressed in this thesis is: How are value networks of newspapers influenced by digital innovation? Addressing the research question, a multi method approach was adopted to gain a broad understanding of how digital innovation influences value networks of newspapers. Drawing on digital innovation literature, the thesis presents a theoretical perspective with which to understand how digital innovation influences value networks. This perspective is instantiated as a model of value network configuration. The model emphasizes the multi-layered, dynamic, dialectic, and diametrical character of value networks in digital innovation. The model is offered as a basis and analytical tool to further explore value networks in digital innovation. This tool is useful for newspaper stakeholders when entering the digital era.

Keywords: digital innovation, value network, value network configuration, ubiquitous media environment, e-paper, e-newspaper, newspaper industry
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1. INTRODUCTION

Perhaps it is a truism to say that information and communication technology (ICT) has become a powerful driving force for innovation. Digital innovation has transformed the structure, processes, and boundaries of the business landscape. The escalating development of ICT has enabled the creation of radically new digital innovations (Yoo et al., 2009). We are now experiencing how most parts of life are pervaded by digitized products and services (Zammuto et al., 2007). This development is gradually shaping and cultivating an information environment that is ubiquitous. Indeed, digital products and services are naturally embedded in the interactions with our environments (Lyytinen and Yoo, 2002a). Evidence of such immersion can be noted in, for instance, education, public services, commerce, and media consumption.

Digital innovation is driven by digital convergence. Digital convergence allows for nearly anything to be digitized and absorbed into our information environments, powered by computing devices, communication networks, and user-generated content. This has led to disruptive effects in many spheres of human life. Not least, the media industry, which is the empirical context of this thesis, is undergoing a disruptive transformation. Digital innovations such as the iPod, Flickr, and YouTube are challenging traditional ways of producing, storing and distributing media content (Yoo et al., 2009). As a result, the media landscape is changing into ubiquitous media environments (UME) where media is constantly present and changes the way media is consumed along the path of digital innovation.

Innovation is a term that widely refers to an outcome perceived as new, weather it is an idea, object, or process, as well as to the process of creating this newness (Slappendel, 1996). The newness may be a recombination of old ideas challenging the present order in such a way that it is new to the people involved (Van de Ven, 1986). Consequently a new idea needs to be translated into a product, service or process and taken into practice to be an innovation. Innovations are adopted when users integrate them in meaningful ways into existing social practices (Tuomi, 2006). Digital innovation refers to innovations enabled by ICT (Yoo et al., 2009). Digital innovation is not merely a shift in technology. It also alters existing relationships within industries and with markets. It demands rethinking existing perceptions of customer value and reinvent existing concepts as a response to these alterations. This development forces organizations to seek new digital innovation opportunities to keep up with competition. The competitive implication of an innovation depends on how it adds value and how it challenges existing market know-how (Abernathy and Clark, 1985).

The value of an innovation is decided within a value network and realized through a business model (Christensen and Rosenbloom, 1995). Value networks extend organizational boundaries to profitably access resources in order to form a business model that creates and captures value in the innovation environment. Open innovation is a paradigm recognizing business models as the source of value creation and value capture (Chesborough, 2003;
According to the open innovation paradigm, organizations draw on external interactions and distributed knowledge in innovation processes, in contrast to traditional organizing of innovation as an internal activity (Vanhaverbeke, 2006). The network of relationships has been recognized as having a key role in the innovation process making organizations highly dependent on other organizations supply of for example new technology or knowledge (Van de Ven et al., 2008). The network of stakeholders outside organizational and industry boundaries has also been acknowledged as important sources of innovation (Chesbrough and Rosenbloom, 2002; von Hippel, 2005).

Past Information Systems (IS) research has generally concerned ICT innovation applications, such as computing capability, system development processes, and services (Lyytinen and Rose, 2003). The main interest has been directed towards how organizations successfully adopt new ICT-based products and processes and how innovation itself can be a driver of organizational and business development (see e.g. Swanson, 1994; Lyytinen and Rose, 2003; Fichman, 2004). This line of research has sought to explain how ICT innovation can be managed and utilized to improve organizational performance. With the introduction of new computing devices and services aimed at consumer markets, another line of research interest has emerged. This research is directed towards understanding the development, diffusion, and adoption of digital innovations on consumer markets, for example new mobile services or new digital products (see e.g. Pedersen, 2005; Constantiou et al., 2007; Mallat et al., 2009). This line of research provides an understanding of how and why new digital products and services are accepted and adopted or not, commonly focusing on how a new product or service, that has already been developed and offered to a market, is received.

Lately an increased interest has been directed towards an understanding of the structures and dynamics of networks of organizations and other actors in the innovation space (see e.g. Lyytinen and Damsgaard, 2001; West, 2003; Van de Ven, 2005; Tuomi, 2006; Boland et al., 2007; Andersson et al., 2008; Yoo et al., 2008). This line of research suggests that innovation is a collective achievement by many actors participating from their own technological frames and business interests, often with different meanings and conflicting interests (Van de Ven, 2005; Yoo et al., 2005). This view of innovation as a distributed process characterized by uncertainty and ambiguity, has gained increased interest as a result of the escalating digitization. Attributable to digital innovations, digital innovation processes are becoming increasingly knowledge intensive and networked (Tuomi, 2006). Networks of organizations are dependent on other networks (Tuomi, 2006) and individual organizations are highly dependent on other organizations competences, resources and knowledge (Vanhaverbeke and Cloodt, 2006). The transformative power of digitization is challenging the frames of networks in digital innovation to move towards distributed and heterogeneous structures spanning organizational and industry boundaries in line with the open innovation paradigm (Yoo et al., 2008).

1.1 Research Question and Objective
The innovation process spans from the practice of inventing to the process of realizing value, and the adoption by a community (Van de Ven et al., 2008). The value of an innovation
is determined and created within interorganizational value networks. In innovation literature, value network is described as “the context within which a firm identifies and responds to customers’ needs, solves problems, procures input, reacts to competitors, and strives for profit” (Christensen, 1997, p. 36). This context may include relationships and exchanges with suppliers, customers, and strategic business partners. Digital innovation leads to transformation of existing value networks (Jonsson, et al., 2008), or even to disruption of value networks and business models (Christensen, 1997; Vanhaverbeke and Cloodt, 2006), and tends to create a need for new and wider relationships and knowledge exchanges (Simard and West, 2006; Yoo et al., 2008).

This thesis approaches digital innovation in the value networks of newspapers. Newspapers are engaged in networks of relationships with, among others, newspapers, publication system providers, advertising agencies, advertisers, and consumers. Digital innovation has transformed and widened the relationships of newspapers. Newspapers have not been engaged with for example telecom providers until the opportunity of offering mobile news services on mobile platforms emerged. New digital services such as mobile internet, social media and so forth are changing newspaper relations to consumers, and thereby the value networks (Ziv, 2005). Value networks have been recognized as very important to realize the potential values of digital innovation (Vanhaverbeke and Cloodt, 2006). Even so, relatively little attention has been paid to how digital innovation influences value networks (West et al., 2006). This thesis attempts to meet this call for research by addressing the research question:

*How are value networks of newspapers influenced by digital innovation?*

The newspaper industry is indeed experiencing the challenges triggered by digital innovation. Constant introduction of new digital technology, increased mobility, changing media consumption and advertising patterns, as well as digital convergence are radically changing the newspaper industry. Undeniably, the digitalization of newspaper publishing has not been trouble-free. It has been very difficult to innovate value, business models and value networks that enable profitable business in digital media. There exists significant uncertainty related to the value networks of newspapers in digital environments (Ziv, 2002; Picard, 2003). This uncertainty has started a debate about the survival of traditional newspapers [1; 2; 3]. Even so, it can be noted that no new media has up till now replaced another in the newspaper industry. That is, digital innovations adopted by newspaper organizations have not been disruptive in the meaning that they have replaced existing technology but rather disruptive to their value networks as acknowledged by Christensen and Davis [2]. Each new digital innovation has led to changed or new value networks, meaning that the socio-technical frames for decisions and value creation have been disrupted.

Now, yet another digital innovation is affecting the value networks in the newspaper industry: the e-paper. The characteristics of this innovation, (a screen technology very close to print on paper) exhibit inherent values that make future replacement of print on paper possible. It is therefore regarded as a very promising technology in the newspaper industry.
However, this prospect is highly challenging to existing industry structures. The traditional business models of newspapers are built on control over production and distribution of content. This thesis is grounded at the intersection of the friction between forces to embark on a new media trajectory and forces to hang on to the established structures and control.

1.2 Approaching Digital Innovation in Value Networks
The research reported in this thesis was conducted within the European project DigiNews. This project investigated how e-paper can enable a new media service innovation, the e-newspaper. To study this setting, the thesis draws on two main areas of research: ubiquitous computing and open and digital innovation. First, the thesis draws on ubiquitous computing as it is represented in IS literature (see e.g. Lyytinen and Yoo, 2002b; Sörensen and Yoo, 2005; Lindgren et al., 2008). Inspired by visions of ubiquitous computing as expressed by Weiser and colleagues in the 90’s, this literature conceptualizes seamless availability of services independently of time and place, ingrained in social and professional life. Second, the thesis draws on open and digital innovation as it is described in organization and IS literature (see e.g Chesbrough et al., 2006; Van de Ven et al., 2008; Yoo et al., 2009). This literature conceptualizes innovation as a networked process spanning organizational boundaries. The key concepts from digital and open innovation to inform this thesis are innovation networks and value networks.

Addressing the research question, I adopted a multi method approach (Mingers, 2001) to gain a broad understanding of how digital innovation influences value networks of newspapers. By combining several data collection methods, a broader understanding of the research phenomenon can be gained (Mingers, 2001; Walsham, 2006). The aim is to contribute with a theoretical perspective on how digital innovation influence value networks to guide future studies as well as practice.

This thesis consists of a cover paper and a collection of six individual papers. The cover paper is structured as follows. Following this introduction, I will in section 2 present the empirical context of the thesis, the newspaper industry. The theoretical underpinning is presented in section 3 followed by the research method in section 4. Section 5 outlines the contributions from the individual papers and presents a model of value network configuration in digital innovation. Furthermore, implications for theory and practice as well as directions for future research are discussed. Section 6 provides concluding remarks of the thesis. After the cover paper follows the collection of six papers. These papers are listed hereafter in the order that they will be referred to in the cover paper.

PAPER 1  

PAPER 2  
COVER PAPER


2. Research Context – The Newspaper Industry

Newspaper industry is at this writing moment under pressure. The Economist titled an edition in August 2006 “Who killed the newspaper?” [3]. The point made was that printed newspapers are under a death role as a consequence of the digitization of media. Newspapers all over the world are suffering from falling circulation and declining advertising revenues as readers and advertisers are turning to digital media. Even though newspaper services have been present on the Internet since the mid 90’s and in mobile phone platforms since the end of the 90’s newspapers have not been capable of building a strong digital business. The traditional business models of newspapers have not worked very well in digital media and the competition has been difficult to meet. Today, we are witnessing how newspaper companies are shutting down. This is a revolutionary development in the newspaper industry.

This situation has provoked a great need for innovation in the newspaper industry (Küng, 2008). However, the inertia in newspaper industry, especially in management and ownership mindsets, has lead to a culture where the printed newspaper is regarded as the “perfect” news service and that change is something negative. The attitude has been that digital media are cannibalizing on print media and that the effort must be directed towards saving the printed newspaper from the digital threats rather than exploring and innovate news services in digital media [4]. The consequence of this mindset has been that newspapers have been moderate on their digital innovation journey so far.

2.1 Early Media Innovations

Historically, there are media innovations to account for in the newspaper industry. The first and most essential innovation was the movable type printing press invented by Gutenberg in mid 1400’s. This was the beginning of mass-production and distribution of printed news. Newspaper industry has a long history and newspapers as we know them today have been printed on paper since the beginning of the 17th century. The oldest newspaper still publishing in print is the Dutch newspaper Opregte Haarlemsche Courant from Haarlem, first published in 1656. The first successful newspaper in America was the Boston News-Letter in 1704 [5].

The second innovation influencing the newspaper industry was the telegraph, invented in 1844. The telegraph radically changed the way newspapers gathered material and how they could spread breaking news. Newspapers role in satisfying the information needs in society became very important. Advertising also became a very important means of market communication. In mid 1800’s, newspapers were the most important source of information for people and businesses in the industrialized world [5].

In the first half of the 20th century, the radio and television entered the media market. These media innovations diffused very quickly and became an alternative information source
to newspapers. To protect themselves against this threat, newspapers were forced to
develop their printed newspapers to be more attractive to media consumers. However,
these media innovations never really challenged newspaper industry economy. Newspaper
industry has been very profitable over time compared to other industries (Picard, 2003).
Since the Second World War the print newspaper market has been mature and apart from
evening press very few new newspapers have started or shut down since then. In other
words, newspaper industry has up until recently led a quiet and undisturbed life.

2.2 Digital Media Innovations
The pressing situation experienced in the newspaper industry today started with the
Internet challenging the traditional business model (Picard, 2003). In 1994 the Swedish
evening newspaper Aftonbladet started to publish on the Internet. This was the starting
point of newspapers digital journey. The internet offered a new publishing channel with the
emergence of new news genres such as the online newspaper, pdf newspapers, and mail
news services. Most newspapers worldwide have an online edition today. However, it has
been troublesome for newspaper companies to profit from online newspaper services. Only
recently has advertizing revenues started to increase and it has been, and still is, very
difficult to charge for content online. The same difficulty is now experienced when offering
mobile services. Indeed, mobile devices and wireless access to content do not only offer
new opportunities but is also challenging to the core business of newspapers.

The situation has been met with cutting costs and making production more efficient (Picard,
2006). In spite of the opportunities afforded by digital technology, little efforts have been
made to innovate customer value propositions, whether media consumer or advertiser
customer value. Newspaper industry has been “stuck” in historical success and very
reluctant to change (see e.g. Boczkowski, 2004; Picard, 2006). Little action has been taken
to expand markets, reach new audiences, or provide new services and products as a
response to this changing media landscape (Picard, 2006). As media economist Robert G.
Picard argues: “To create lasting value, the business fundamentals of who they are, what
they are, and how they serve readers and advertisers need to be examined by newspapers”
(Picard, 2006, p.11). This will require innovation capability and entrepreneurship infrequently
found in newspapers in recent years (Picard, 2006). The print model has become a strait
jacket holding back innovative efforts in digital media.

However, newspaper industry has been more innovative when it comes to technology for
production such as publishing systems, content management systems, and advertisement
systems. In newspaper industry, innovation has most often been a closed activity within an
organization or within industry. There has been little interaction and networking outside
organizational and industry boundaries. Technology has been developed in-house or bought
into the organization and innovation control and management has been centralized (Picard,
2006).

Today, many newspaper organizations are putting more effort into digital media to find new
business opportunities. Some refer to themselves as media houses publishing in multiple
channels offering services anytime and anywhere. Innovation efforts are put into new
services like the e-newspapers discussed in this thesis. However, the digitization of newspaper media drives newspaper organizations to engage with new actors. In the case described in this thesis, newspaper organizations and device producers engage in forming a value network around a new digital innovation, the e-paper.

2.3 The E-paper Innovation

E-paper is a common term for digital displays that imitate print on paper. One of the most common e-paper technologies is Electronic-Ink (E ink). E ink is a technology using tiny microcapsules to appear as black and white spots on a sheet of paper. These microcapsules contain negatively charged black particles and positively charged white particles enclosed in a clear liquid. By applying positive and negative electric fields the particles move from the top and bottom of the micro capsule and thereby a white or black dot appears on the display surface [6]. Figure 1 illustrates an example of E ink printed on e-paper.

![Figure 1. The principle of e-paper displays](Grafik: Martin Gradén, © Sundsvalls Tidning)

In Figure 1 a printed page appears as a newspaper page (1) on an e-reader device. The page contains the printed letter e (2). The letter e is created by black and white spots (3), in turn accomplished by applying negative versus positive charge to the black and white particles contained in the microcapsules (4).

E-paper technology does in other words not use any backlight to illuminate pixels. The E ink spots are reflected like ordinary print on paper which allows a wider viewing angle compared to other digital display technologies. The more light the better reading conditions, like with print on paper. E-paper enables high resolution and high contrast displays. The resolution is about 160-167 dpi which is the same as printed newspapers, and 16 levels of grayscale which enables a reading experience close to print on paper (see Figure 2).
Figure 2. The New York Times on an Amazon Kindle device with e-paper display [7]

As can be seen in Figure 2 the E ink print on e-paper clearly mimics traditional print on paper. Another advantage with e-paper is the very low power consumption. A printed text or image does not require any power to be maintained. It is only the printing that requires power. Further, e-paper is thin, light weighted, and durable. It is also possible to mark, draw and take notes on e-paper just like on ordinary paper as shown in Figure 3.

Figure 3. Handwriting on an iRex iLiad device with e-paper display [8]

These characteristics enable utilizing e-paper to design light weighted devices with high readability displays and very low power consumption. On the other hand, there are some disadvantages compared to competing display technologies. One disadvantage is the difficulties with color on e-paper displays. Color filters have been used but these techniques compromise the resolution and brightness of the display [9]. In particular, this is a disadvantage for newspaper publishing and advertising. Another disadvantage is the low refresh rate making for example animations unacceptably slow. E-paper is still under development, a lot of R&D efforts are put into developing e-paper technology further. For example color and bendable displays are under development. Philips research has announced a new approach to color e-paper that may offer bright and clear color displays [8; 9]. Thin and flexible e-paper is announced by for example Fujitsu, Plastic logic, and Readius displayed in Figures 4, 5 and 6 [10].
There are several e-reader devices on the market. E-readers are devices dedicated for reading using e-paper technology. However currently there are only monochrome displays implemented in these devices. Examples of e-reader devices are the Amazon Kindle, Sony Reader, Bookeen Cybook, STAReBOOK and iRex iLiad [10]. The iRex iLiad was the device used in the DigiNews project which this thesis is based on. There are many newspapers that are available in e-reader devices. For example the New York Times, Wall Street Journal, Le Monde and Shanghai Daily publish on the Amazon Kindle. Examples of newspapers available in the iRex iLiad are the The Washington Post, The Guardian, The Times, The Daily Telegraph, Daily Mail, The Age, Le Figaro, and The Irish Times.

The most common model behind these publishing platforms is that the newspaper consumer buys the newspaper from a service provider. In the Amazon case newspapers are available through the Amazon Kindle Store [11]. The newspapers on the iRex iLiad are available through Newspaper Direct [12]. There are also newspapers that offer newspaper services directly to their customers such as the French financial newspaper Les Echos that offer subscriptions to the iRex iLiad through their own website [13]. The Hearst Corporation has recently announced that they will launch their own e-reader device designed specifically for newspaper publishing with larger size allowing more complex layouts and advertising [14].

Like many other media sectors, newspapers are turning to digital technologies with hope of finding a silver bullet to overcome the severe economic situation. There are hopes of the e-paper innovation becoming a piece of a puzzle that will save newspapers from their pressing situation. However, there are many pieces that need to fall into place for this to happen. Even if there are several advantages with e-paper devices for newspaper publishing there are also challenges. Some are related to the e-paper technology (monochrome and slow refresh rate), and to the design of devices (most are more suited for book reading than newspaper reading) [10]. Others are related to media consumers and advertisers adopting e-newspapers in the numbers and pace required to make business lift. However, as this thesis will demonstrate, there is no silver bullet in the digital technology as such. The most challenging for newspaper industry is to act concertedly in the process of forming the value networks and business models that will support the e-newspaper business.
3. Theoretical Background

This thesis draws on two main research areas in IS: ubiquitous computing and digital and open innovation. The ubiquitous computing literature intends to serve as a background to situate and describe the digital innovation space within which this research has been conducted. The concepts from ubiquitous computing provide a language to describe the innovation space and the ongoing digitization in the newspaper industry. In this thesis, I refer to this innovation space as ubiquitous media environments (UME). Concepts from digital and open innovation function as an analytical framework to interpret how value networks are influenced by digital innovation.

3.1 Ubiquitous Information Environments

Ubiquitous computing was introduced by Mark Weiser (1991), at the Computer Science Lab at Xerox PARC, to describe a computing environment where information technology is naturally embedded in physical and social interactions with our environment. About ten years later, ubiquitous computing started to attract attention from IS researchers presenting ideas and results in dedicated IS journals and conferences (Lyytinen and Yoo, 2002b; Sørensen and Yoo, 2005; Topi, 2005; Yoo and Lyytinen, 2005). In this research, ubiquitous information environments have been described as the next wave of computing environments following the era of personal and stationary computing. Different themes have been addressed, often characterized by visionary and experimental approaches. Examples are organizational and social implications (Lyytinen and Yoo 2002a; Yoo and Lyytinen, 2005), design issues (Henfridsson and Lindgren, 2005) innovation (Andersson et al., 2008), e-business (Roussos, 2006), and value creation (Jonsson et al., 2008).

Given the development of mobile and interactive technologies as well as new media applications and converging network technologies, IT penetration of everyday life has increased dramatically (Zammuto et al., 2007). Ubiquitous information environments are becoming as important part of private life as it is of working life. Therefore, it is of equal importance to understand ubiquitous information environments in every-day life, beyond organizational and work settings (Sørensen and Yoo, 2005). Digital information and communication technology has become a naturally embedded part of the designed environment we live in.

One vision of ubiquitous information environments that has inspired many IS researchers, was a research commentary presented by Lyytinen and Yoo (2002b) in the journal Information Systems Research. Lyytinen and Yoo (2002b) portrayed ubiquitous information environments to be characterized by a heterogeneous assemblage of integrated socio-technical elements. In this thesis, this framework has functioned to situate and describe the digital innovation space in the newspaper industry. As pictured in Figure 7, ubiquitous information environments have a layer of information infrastructure and a layer of digital services.
Figure 7. Ubiquitous information environments (Lyytinen and Yoo, 2002b, p. 378)

The infrastructure layer enables seamless distribution of services, anytime and anywhere adapted to users’ context. Depending on the resources at hand, and the contextual circumstances, users interact with a multitude of interconnected devices in a given situation. The infrastructure is heterogeneous, geographically dispersed, and institutionally complex without any centralized coordination mechanisms. The development of ubiquitous information environments is influenced and enabled by three interdependent key drivers: mobility, digital convergence and mass scale (Lyytinen and Yoo, 2002b). Mobility refers to physical as well as social movements of users, objects, and services that move across and between devices. Digital convergence refers to integration of infrastructures for processing and distributing services to a multitude of devices, mobile as well as stationary. Mass scale concerns the availability of infrastructure and services at a global level as well as mass scale volume and diversity of services. Ubiquitous information environments surround all levels from individual, to working group, organizational to the interorganizational level.

Drawing on this framework of ubiquitous information environments, the term ubiquitous media environments (UME) is used in this thesis to represent a vision of future media environments enabling device independent distribution of media services in integrated infrastructures, and in mass-scale. Relating to the newspaper industry this is a scaled up vision compared to today’s media landscape. Still, geographical and language zones are barriers in the media landscape. In this vision, media would target any-one who can benefit from the media content and adapt that content to users’ situation.

Such media environments would enable distribution of media services including advertising content to any media consumer, anywhere, at anytime, and to any device. Therefore, a very central aspect of UME, as in any ubiquitous computing environment, is the context of use (Abowd and Mynatt, 2000). This means that information about the background and specific circumstances surrounding the use situation is deployed in adapting services. Context information is any information that can be used to characterize a situation such as location, identity, state of people, groups, and computing resources (Dey, 2001). In this view, context is regarded as information related to the situation in which interaction occurs. Context can also be regarded as a relational property between objects and activities (Dourish, 2004). This means that context is dynamically shaped in action rather that pre-defined and stabile.
The innovation journey leading to UME has started but I believe there is a long way ahead before we would see UME as a taken for granted media landscape. For the newspaper industry, this development has disruptive consequences. As described in the previous section, traditional newspaper industry largely rests on a solid socio-technical base, centrally owned and controlled within the industry. The development towards UME is leading this industry into a mass-scale socio-technical environment out of any single organization’s or industry’s control. Ubiquitous information environments have been described as consisting of a web of equipment, techniques, applications, and people that creates a social context including the infrastructure that supports its development and use and the social relationships and processes of its use (Boland et al., 2007). This means that these environments are not designed in a system design process in a classical meaning; there is no clearly defined system owner or centralized control. Rather it resembles an ecological environment that media exists in and has to adapt to and live in together with others.

As recognized in the previous section there is a pressing need for innovation in the newspaper industry. Given that media is being increasingly digitized, the industry is more and more engaging in digital innovation to identify new business opportunities. However, to identify and exploit business opportunities and create value in ubiquitous environments is very challenging (Fleisch and Tellkamp, 2006). This is the challenge for and within the value networks of newspapers in UME innovation spaces.

3.2 VALUE NETWORKS IN DIGITAL AND OPEN INNOVATION

Networks of relationships have been recognized as having a key role in the innovation process. The innovation process spans from the practice of inventing to the process of realizing value, and the adoption by a community. Typically, an innovation process is a non-linear cyclic process divided in three periods: an initiation, a developmental, and an implementation period. The innovation process is terminated when an innovation is adopted or abandoned (Van de Ven et al., 2008). Targeting at a desired outcome, the innovation process can be described as the development and implementation of new ideas by people engaged in relationships. The relationships often extend organizational boundaries since a single organization rarely has the resources, competencies, and legitimacy needed alone. These networks of relationships span several levels, from personal relationships, to formal relationships between organizations to relationships within an industry infrastructure (Van de Ven et al., 2008).

There are two main categories of networks in innovation literature: innovation networks and value networks. The innovation network is more related to research and development of innovation while the value network is related to realizing and commercializing the inherent value of an innovation (Vanhaverbeke and Cloodt, 2006). The innovation network is formed when an innovation process is initiated to supply the knowledge, capabilities and resources required in the innovation process (Van de Ven et al., 2008). When the process has proceeded to a suggestion that can be translated into value propositions the value network is starting to take form. The process of transforming the inherent value of an invention may require networks with other participants, activities and exchanges than the network needed
in the process of inventing. These two network constellations might be very integrated and difficult to distinguish. Value networks and innovation networks can be regarded as mirroring images (Vanhaeverbeke and Cloodt, 2006). While the innovation network resolves when the innovation process is terminated, the value network continues to exist in the product or service lifecycle.

In this thesis, the focus is on value networks. Even so, the close relationship and blurred boundaries between innovation network and value network as well as the view that value network and innovation network are mirror images, makes it relevant to visit related literature on innovation networks to better understand value networks. The following subsections will present a description of the nature, dynamics, and structure of value networks.

3.2.1 The Nature of Value Networks

Value networks are of complex nature. First, the nature of value networks is closely interrelated to value and business models of an innovation. The role of value networks is to link innovation potential to value mediated through the business model. Second, value networks are multilayered and interconnected in systems of value networks, and they exist in hierarchies as well as in parallel (Christensen and Rosenbloom, 1995). Value networks include the set of actors and interactions needed to achieve the determined value of an innovation (Allee, 2008). Outside organizations’ boundaries, value networks include relationships to suppliers, technical solution providers, investors, strategic business partners, customers and so on. For example, the value network of a new mobile news service may include relationships between content providers such as newspapers, mobile phone operators, advertisers, and mobile phone users. A value network is initiated during the innovation process by a focal actor creating the relations needed to realize business opportunities of an innovation.

The inherent value of a new innovative technology is determined within the value network and realized through a value creating process (Chesbrough and Rosenbloom, 2002; Yoo and Lyytinen, 2005). The traditional view of value creation is the activities an organization performs to create a value proposal. The value chain framework presented by Porter (1985) explains value creation as a chain of activities performed by organizations that contribute to the value of a product or service offered to the market with the objective of maximizing profit at a minimum cost. This approach is challenged in the digital economy (Allee, 2000). Digital economy is dynamic and characterized by rapid development and high competitiveness (Amit and Zott, 2001). Norman and Ramirez (1993) argue to shift from a single organization’s value chain thinking to value network thinking where all stakeholder co-produce value. This includes co-creation of value with and between customers (Stabell and Fjellstad, 1998; von Hippel, 2005). Value network is a more inclusive and flexible structure than the value chain construct and therefore regarded to fit better to the networked value creation in digital innovation (Allee, 2008). A value network creates value through complex and dynamic exchanges of three types of value currencies: goods, services, and revenue; knowledge; and intangible benefits (Allee, 2000). According to Allee
knowledge and intangible values are of equal importance as revenue exchanges, not the least in the information and knowledge economy. For instance, Göteborgs-Posten may offer knowledge about and access to their newspaper consumers as a value currency in a value network.

The relations in the value network are linked by the business model defining the value creation process from which the different actors capture value (Chesborough and Rosenbloom, 2002). The business model is the architectural configuration of the components of transactions needed to realize business value and related to a focal actor who organizes and has the strongest incentive (Amit and Zott, 2001). From a focal actor's point of view, the business model describes how organizations, customers, suppliers and so forth are linked. This includes identifying customer segments and the structures for value creation and value capture (Chesborough, 2003). This means that different organizations will have different business models within the same value network. For example, Le Monde has one business model connected to the publication of an e-newspaper service on an e-reader device whereas a device producer such as iRex has another. Still they co-create the value related to the e-newspaper service within the value network. Even though a business model refers to a particular focal actor its impact spans organization boundaries (Amit and Zott, 2001). Orchestrated by organizations architecting business models, network members are aligned to realize value targeting a defined customer base (Vanhaverbeke and Cloodt, 2006). Different customer segments may have different value perceptions, in other words the same underlying digital technology may have different inherent values depending on market segment. The value network shapes the roles in the value creating process (Christensen and Rosenbloom, 1995) and thus value is dependent on how the value network is designed and vice versa (Vanhaverbeke and Cloodt, 2006).

Indeed there is a close interrelationship between the value network, value and business model around innovation as illustrated in Figure 8.

![Figure 8. Value network interrelationships](image-url)
This model can be regarded as a recursive model of value networks in the meaning that the model refers to value networks itself as a component of a system of interrelationships centered on innovation. These different components are interconnected forming different domains of innovation (Chesbrough and Rosenbloom, 2002). In Table 1, these components are summarized from literature.

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
<th>Literature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>Value of an innovation is determined within the value network and co-created through exchanges of goods, services, and revenue; knowledge; and intangible benefits.</td>
<td>Allee (2000), Chesbrough and Rosenbloom (2002), Yoo and Lyytinen (2005)</td>
</tr>
<tr>
<td>Business Model</td>
<td>The configuration of the relations and transactions needed to realize and capture value.</td>
<td>Amit and Zott (2001), Chesborough and Rosenbloom (2002)</td>
</tr>
</tbody>
</table>

Table 1. The components of the value network model

The model of value network interrelationships provides an understanding of the nature of value networks. The complexity of the nature of value networks is, in addition to the interrelated nature, associated to value networks being *multi-layered and interconnected* system of networks (Christensen and Rosenbloom, 1995) and innovation paths (Henfridsson et al., 2009). For example, Sundsvalls Tidning is part of the value network of the printed newspaper, of the online newspaper, of local mobile news services as well as local radio. The value networks surrounding these businesses are not the same since they are built on different relations, exchanges and business models. Still, they are interwoven and interconnected on different levels and thereby innovation paths within each have influence on the others.

Another aspect of the multi-layered nature of value networks is related to the levels of competition. As demonstrated in the open source software business, an open value network structure offer advantages such as preventing underinvestment in complementary assets, favoring wide-spread adoption over strong value capture leading to positive networks effects, and as a result of wide-spread adoption scale of economy effects (West, 2007). This results in a shift of competition level from between organizations to between networks of organizations. Van de Ven (2005) takes a strategic view and argues that organizations that run in packs have better conditions to succeed in innovation. Running in packs is a metaphor for innovation processes that are collective, with organizations simultaneously cooperating and competing as they develop and implement an innovation. The advantages on the co-operation side of running in packs are the possibilities of sharing resources, competences, costs and risks. The competition side is driven by each individual organization’s self-prevailing interests. The higher the number of actors in a value network the more difficult it
is to distribute value captured within the value network. The strength of the network depends on the relative advantage of being a participant in the network compared to other network constellations (Vanaverbeke and Cloodt, 2006). These tensions create dynamics in the value networks.

### 3.2.2 The Dynamics of Value Networks

Value networks are not static; they dynamically change over time (Christensen and Rosenbloom, 1995). The dynamics of value networks in digital innovation is related to several different aspects. First, as highlighted above, the co-opetition in digital innovation creates dynamic behavior. Second, constant improvements and development of digital technology change network structures or even cause emergence of new value networks. Third, the systemic character of digital innovation tends to drive organizations to multi-layered networked innovation environments. Lastly, digital innovation tends to lead to contradictory behavior.

The first aspect of the dynamics of value networks is related to the conflicting goals of co-opetition in digital innovation (Vanaverbeke, et al., 2006). To jointly create customer value competitive to alternatives on the market along with maximizing value captured for the organization itself needs to be balanced with allocating value capture among other participants in the value network to ensure relative advantage compared to competing networks (West et al., 2006). As stated by Yoo et al. (2005), successful digital innovation calls for strategies that enable organizations to organize broad socio-technical networks, accordingly widening network relations. As the innovation process proceeds, the network is transformed and reconfigured as new visions or needs develops. When new actors are enrolled, the perception of the innovation is negotiated. In these negotiations, organizations might have to compromise their own ideas in order to align conflicting interests. For instance, content providers such as newspapers, service providers, and device producers have conflicting interests on e-reader platforms. These interests are negotiated with for example device producers such as iRex and service providers like Amazon in order to identify business models that balance value captured among network participants. As long as the balance is not satisfactory to the participating network members the value network will be changing. This results in a dynamic digital innovation processes, characterized by not only technical complexity in but also complex political processes within the associated networks (Yoo et al., 2005; Van de Ven et al., 2008).

Along with the second aspect of improvements and development of digital technology, the structures of the value network changes over time. Digital technology advancements may cause migration of innovations to new networks, and new technological paradigms may cause the emergence of new value networks (Christensen and Rosenbloom, 1995). In the newspaper industry for example, new digital innovations have been adopted with the result of new emergent but still interconnected value networks that influence each other. Boland et al. (2007) demonstrated in the domain of architecture, engineering, and construction that innovations travel across innovation spaces like a wake. Out of single distinct innovations, wakes of innovations were created that overlapped and interacted with each other. These
wakes affect other innovation contexts in a recursive manner. Thus, a wake of innovation can export path-dependence within and across networks and may be part of the initial conditions of another innovation process (Van de Ven et al., 2008). The same technology can thereby play different roles in different value networks (Christensen and Rosenbloom, 1995). For example, the e-paper innovation plays very different roles in value networks related to media content compared to value networks related to public displays in for instance department stores.

The third aspect of the dynamics of value networks is related to the systemic character of digital innovation (Maula et al., 2006). Chesbrough and Teece (1996) introduced the notion of systemic innovation to represent an innovation whose value can only be realized in a system of complementing innovations. As a result, systemic innovation has influence beyond a single innovation context and requires networked coordination. The E ink innovation for instance, has created a system of interrelated innovations like e-paper, e-readers, and e-newspapers that complement each other. Changes in a products or service architecture, for example that one component of the architecture changes (such as enabling color e-paper displays), presents more subtle changes in adjusting to the new architecture but also potentially offers opportunities to improve strategic advantages (Henderson and Clark, 1990). This involves innovating business models and creating new markets. Improving the strategic advantages challenges the organizations knowledge of the market and customers (Abernathy and Clark, 1985). As a result Christensen and Rosenbloom (1995) argue that an innovation can be complex even if it is technically simple. New and radically different business models from an organizations competition may force a focal actor to set up or join networks beyond their traditional relations (Vanhaverbeke and Cloodt, 2006). The complexity is related to the degree of mobility required in and across value networks (Christensen and Rosenbloom, 1995).

Lastly, the nature of digital innovation seems to create contradictory behavior. Digital innovation drives organizations to widen their interorganizational relationships (Simard and West, 2006), span boundaries of knowledge creation and sharing (Jonsson et al., 2009), and to more distributed and heterogeneous knowledge and control structures (Yoo, et al., 2008). However, there also seems to be contradictory driving forces in play. Jonsson et al. (2009) illustrate in a study of remote diagnostic systems how organizations changed their boundary spanning behavior in contradictory ways. Organizations crossed and created new boundaries on the on hand, and reinforced existing boundaries on the other. These contradictory processes re-shaped existing boundaries and practices as well as the role of IT in boundary spanning from a mediating role to an enabling role. Similar patterns were observed by Henfridsson et al. (2009) in the auto industry. Designers enacting new innovation paths were observed to negotiate and re-negotiate dominant structures with emergent structures. This behavior created contradictions between established structures and new innovation trajectories. The resulting innovation dialectics potentially transforms established structures into new socio-technical configurations (Henfridsson et al., 2009). Van de Ven et al. (2008) explain this dialectics as a cycle of divergent and convergent behavior. Divergent behavior explores and expands new innovation directions, ideas, competences,
and relationships. Convergent behavior is an integrating and narrowing process. Divergent behavior increases complexity while convergent behavior reduces complexity. These cycles can exist at different levels and parallel in time and changes the structure of value networks. Taken together, these aspects of value network dynamics have effect on value network structure. In Table 2 the aspects of value network dynamics in digital innovation are summarized.

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Literature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improvements and development of digital technology</td>
<td>Christensen and Rosenbloom, 1995; Boland et al., 2007</td>
</tr>
<tr>
<td>Systemic character of digital innovation</td>
<td>Maula et al., 2006; Vanhaverbeke and Cloodt, 2006; Christensen and Rosenbloom, 1995</td>
</tr>
<tr>
<td>Co-opetition in digital innovation</td>
<td>Vanhaverbeke, et al., 2006; Yoo et al., 2005; West et al., 2006</td>
</tr>
<tr>
<td>Contradictory behavior in digital innovation</td>
<td>Henfridsson et al., 2009; Van de Ven et al., 2008; Jonsson et al., 2009</td>
</tr>
</tbody>
</table>

Table 2. Aspect of value network dynamics in digital innovation

3.2.3 The Structure of Value Networks
The structure of value networks differ along several dimensions. These dimensions concern among others: interorganizational relations; coordination and control; knowledge resources; market linkages; and competence.

The nature of interorganizational relations within a value network forms one structural element. Simard and West (2006) discuss how two dimensions of network ties differentiate networks. The first dimension polarizes deep ties where knowledge is homogenous from wide ties where knowledge is heterogeneous and more difficult to capture. The second dimension, formal versus informal ties, polarizes planned and contracted ties from ties characterized by personal and social contacts. These two dimensions explain how interorganizational ties influence innovation potential (see Figure 9).
Simard and West (2006) argue that wide ties have greater potential to reach radical innovation and deep ties seem to lead to incremental innovation. Radical innovations establish new core designs whereas incremental innovations are minor improvements or adjustments to products or services (Henderson and Clark, 1990). In informal networks it is more difficult to manage and control knowledge exchanges than in formal networks. This agrees with Yoo et al. (2009) who argue that the outcome of an innovation process is very influenced by the configuration of the network. Adding to this complexity, digital innovation in some cases forces actors without any previous history into new networks (Yoo et al., 2009). This can be observed in the newspaper industry that today is engaged in value networks in digital media in parallel with the traditional print media.

As a result of the massiveness of digitization digital innovation processes are becoming increasingly distributed (Yoo et al., 2009), not the least in ubiquitous environments (Jonsson et al., 2009). Distributed innovation processes change roles and relationships within networks as has been demonstrated in offshore software development (Ågerfalk and Fitzgerald, 2008; Olsson Holmström et al., 2008). Yoo et al. (2009) argue that new types of innovation networks are emerging. These new innovation network structures can be classed by two dimensions: the homogenous verses heterogeneous nature of knowledge resources and the distribution of coordination and control over actors and resources in the network (Yoo et al., 2009). These two dimensions lead to four different archetypes of innovation networks; singular, distributed, systemic, and doubly distributed networks (see Table 3).
The singular and distributed network classes require homogenous knowledge resources to be identified and assembled. The difference is that singular networks are similar to traditional closed innovation structures such as an internal R&D department managing and controlling the innovation process within an organization. The distributed network class forms a network with distributed coordination and control, like in the open source software community. These two classes mostly involve incremental digital innovations. This is in line with the observation by Simard and West (2006), that overlapping and redundant knowledge bases in interorganizational ties tend to lead to incremental innovation. The systemic and doubly distributed classes of innovation networks are heterogeneous assemblages of multi-disciplinary knowledge resources. Like the singular network, the systemic network is characterized by centralized control structure, typically within a single organization. The doubly distributed network is without hierarchical control. This is the most complex structure of the four. The systemic and the doubly distributed structures involve architectural innovations.

Adding to incremental and radical innovation Henderson and Clark (1990) describe that changes in the core design concepts leads to modular innovation and changes in the relations between these leads to architectural innovation. Architectural innovation challenges organizations knowledge bases and may have significant competitive implications. These ideas can be linked to the ideas of Abernathy and Clark (1985) who suggest a framework explaining innovations according to their effects on markets and competences. These two axis form a typology of four innovations types: regular, niche, architectural, and revolutionary (Figure 10).
The framework in Figure 10 is grounded in an innovation’s product or service lifecycle and highlights that innovations can be disruptive to market and customer linkages as well as disruptive to competence in production systems. Seemingly, the later would also apply to the value creating process. During the product or service lifecycle, innovations may shift from one type of innovation to another. The architectural innovation type involved in doubly distributed networks thus has the most disruptive effects on market linkages and competences in the value creation process. Yoo et al. (2009) argue that movement towards doubly distributed networks is required for digital innovation, and that digital information infrastructures increasingly will support this type of innovation networks.

Against this background, dimensions of structures along which value networks differ can be identified. Table 4 summarizes these dimensions.

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Interorganizational relations (Simard and West, 2006)</th>
<th>Distribution of coordination and control (Yoo, et al., 2009)</th>
<th>Knowledge resources (Yoo, et al., 2009)</th>
<th>Market linkage (Abernathy and Clark, 1985)</th>
<th>Value creation competence (Abernathy and Clark, 1985)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Formal</td>
<td>Informal</td>
<td>Centralized</td>
<td>Distributed</td>
<td>Homogenous</td>
</tr>
<tr>
<td></td>
<td>Deep</td>
<td>Wide</td>
<td>Entrenched</td>
<td>Disrupted</td>
<td>Entrenched</td>
</tr>
</tbody>
</table>

**Table 4. Structural dimensions of value networks**
This overview shows that the nature of digital innovation indeed influences value networks. It is clear that value networks in digital innovation are multi-layered and that the dynamics of network changes is highly complex. Further it is clear that knowledge, competences, relationships and control are diverse and heterogeneous. Still, innovation networks are recognized as an important research area in IS (Yoo et al., 2009) to be further examined. Even though innovation networks and value networks are closely related, value networks are a specific class of networks (Vanhaverbeke and Cloodt, 2006). Therefore, there is an interest in specifically addressing value networks concerning these aspects. Although value networks are recognized as very important in digital and open innovation literature, there is little IS work presented that highlights these aspects related to value networks. Further, it is important to emphasize that one organization can participate in multiple and parallel value networks. Different types of networks are recognized in literature (Yoo et al., 2009) but there is little discussion on what the implications are for organizations participating in more than one network. There is a need to understand this complexity from a theoretical as well as a managerial point of view (Vanhaverbeke and Cloodt, 2006). In particular, there is a need to understand how the nature, dynamics, and structure of value networks are influenced by digital innovation and in turn how that influences value network configuration (West et al., 2006; Yoo et al., 2009).

Building on this theoretical background, this thesis attempts to fill this gap in literature by seeking to develop a theoretical perspective to help explain how digital innovation influences value network configuration. The next section presents how this gap has been addressed.
4. Research Methodology

All research rests on some underlying philosophy of how to achieve an understanding of the research phenomenon, including assumptions of what makes research legitimate and how the research should be conducted to develop new knowledge that is well-grounded and relevant. I will start this section with a brief background to the philosophical underpinning of this research. Then, I describe the DigiNews project and explain the methodological details including research design, data collection, and data analysis. In addition, I outline a reflective account of my research process by self-assessing it according to an established set of criteria of interpretive research.

4.1 Philosophical Underpinnings

This thesis is based on an interpretive perspective. Such a perspective posits that our knowledge of reality is a social construction by human actors (Walsham, 1993). Meaning is created and associated when people interact with the world around them and is embedded in socially constructed representations such as language, consciousness, shared meanings and artifacts (Klein and Myers, 1999). Given this view of meaning-creation, it is necessary for the interpretivist researcher to study phenomena by seeking to understand the social construction of meaning that is associated with the research setting (Orlikowski and Baroudi, 1991).

Interpretive research in IS is typically associated with case studies, action research, and ethnographies (Walsham, 2006). Regardless of the specific methodology chosen, the fundamental base of interpretive research is the researcher’s involvement, ranging from passive observation to intentional action. In fact, the researcher’s involvement in fieldwork is the basis for collecting data that is useful for interpretive analysis.

The hermeneutic circle is described by Klein and Myers (1999) as the fundamental principle of interpretive analysis. The hermeneutic circle suggests that new understanding of the whole is constructed from an understanding of individual parts, and in turn, the individual parts are understood with reference to the whole in an iterative process. This iterative process and interrelationship between the whole and the parts forms the hermeneutic circle (Klein and Myers, 1999).

This research seeks to understand how digital innovation influences value networks. Manifested as a hermeneutic circle, my research process entailed multiple iterations between dissecting the parts of value networks and seeking to build them up as a coherent whole. For instance, iterating between value perceptions of the e-newspaper and interorganizational value networks as a whole is an example of such iteration. This iterative process is influenced by the interpretive researcher’s prior assumptions, beliefs, values, and interests (Orlikowski and Baroudi, 1991). In my case, this pre-understanding was initially strongly related to my educational and professional background in business administration and information systems. During the project time, I learned more about the newspaper
industry and about newspaper organizations, which has influenced my understanding as a result of the close relationship built up with the newspaper participants. The studies of parts of value networks have been influenced by the understanding obtained while studying another. While every attempt to rationalize this process risks over-simplification, it is fair to say that the cover paper presents my understanding of value networks as a whole while the individual papers pay attention to different parts.

My understanding of value networks builds on research conducted within the DigiNews project (ITEA 03015). DigiNews was a two-year collaborative research project, including several major newspaper companies, technology firms, and universities across Europe. This project can be described as an interpretive study in which a multiple method approach was adopted in order to get a rich understanding of the research topics.

4.2 THE DIGINEWS PROJECT

DigiNews was an ITEA project. ITEA is a cluster program within EUREKA aiming at supporting the competitiveness of European companies through international collaboration in creating links and networks of innovation. The primary outcome of ITEA programs is therefore not academic research but rather business development.

Nevertheless, ITEA projects are very suitable to study emergence of value networks. ITEA projects are oriented towards building networks in which participants share the risk and benefits of IT innovation, aiming at realizing useful and commercially relevant innovation value. The DigiNews project was initiated by Philips Applied Technology in Belgium in collaboration with the Swedish Newspaper Publishers’ Association. The Swedish part of the project was funded by VINNOVA (The Swedish Governmental Agency for Innovation Systems). The project started in mid-year 2004 and ended mid-year 2006. The Media IT¹ group, of which I am a member, was engaged in the project six months prior to the official start of the project. It also engaged in follow-up studies and evaluation that lasted six months after the official project ending. In total, I therefore worked with the project participants for three years.

The overall goal of the DigiNews project was to explore market oriented research and development issues for an electronic newspaper enabled by e-paper technology. The e-newspaper in the DigiNews solution was tested on an e-reader device under development by Philips Applied Technologies which continued to be developed and manufactured in iRex, a start-up company originating from Philips Applied Technologies. In the project the iRex device iLiad was used for demonstration. The newspaper content was produced by some of the participating newspapers in collaboration with the Media IT group from Halmstad University.

The project consortium consisted of complementing companies and research institutions from Belgium, Spain, Netherlands, France, Germany and Sweden. The Media IT group was

¹ For more information about Media IT see media-it.hh.se. Carina Ihlström Eriksson and Jesper Svensson are the colleagues from Media IT I worked with in the DigiNews project.
engaged by the Swedish Newspaper Publishers’ Association during the project application phase in addressing design and business model issues. The Media IT group was primarily working with the newspaper partners in the project. The Swedish newspaper partners were Aftonbladet, Göteborgs-Posten, Nerikes Allehanda, Norrköpings Tidningar, Sundsvalls Tidning, Sydsvenskan, and Östgöta Correspondenten. European newspapers were Concentra Media in Belgium, De Telegraaf in the Netherlands, and Le Monde in France.

The business theme of the project is the part discussed in this thesis. The newspapers were the focal actors in our studies. The value network being under formation and the relating aspects of value networks has been studied with the perspective of the newspaper organizations as the main reference point of the e-newspaper value, value network, and business model. However, these concepts have a wider scope than one organization or a group of organizations (Amit and Zott, 2001), in this case the scope is spanning industry boundaries.

4.3 RESEARCH DESIGN – A MULTI-METHOD APPROACH

Innovation research is multi-layered in that it spans across multiple levels of analysis. It ranges from the individual level to the interorganizational and regional levels (Gupta et al., 2007). Likewise, as highlighted by Amit and Zott (2001), researching business issues require multiple perspectives and theories to explain the phenomenon. In a similar vein, Vanhaverbeke and Cloodt (2006) call for multiple theoretical frameworks to explain the complex nature of value networks in digital innovation.

Given the multifaceted nature of value networks, I adopted a multi-method approach to understand the influence of digital innovation on value networks (Mingers, 2001). Multi-method approaches refer to the combination of different methods, often qualitative and quantitative methods, to generate more comprehensive explanations of complex phenomena. Mingers (2001) argues that there are several reasons for this approach. First, combining methods from different paradigms allows a richer understanding of the complexity of reality since they focus on different aspects. Second, research is typically a process with different types of activities making different methods useful at different phases of research.

On a detailed level, Petter and Gallivans (2004) suggest five motives for using mixed methods: triangulation, complementarity, development, initiation, and expansion. They recognize triangulation motives as seeking accuracy and validity to results by applying different methods, each strengthening the weaknesses of another. The complementarity motive uses mixed methods to examine different aspects of the same phenomena or to examine overlapping phenomenon. Development refers to the motive of using one method to help develop another primary method, for example using interviews to inform the design of a questionnaire or vice versa. Initiation is conducted to find contradictions in order to reframe the understanding of a phenomenon. Finally, expansion motive aims at expanding the scope and breadth of the research to generate a more comprehensive understanding than a single method can offer. This motive is also recognized by Mingers (2001) as a possibility to widen the scope of a study to take in wider aspects. The multi-method
approach in this thesis is driven by an expansion motive to generate a broad and comprehensive understanding of how digital innovation influences value networks.

In adopting only one theory, a limited view of the research phenomenon is gained (Mingers, 2001). As stated by Walsham (1993), “theory is both a way of seeing and a way of not seeing” (p. 6). Accordingly, the individual papers included in this thesis are drawn on different theoretical areas to focus on a specific part. Theories are often linked to a methodological approach for data collection and analysis. Nonetheless, different theoretical lenses and analysis techniques can be applied to the same data to expand the understanding of results (Traut and Jessup, 2000). Following this line of argument, research on complex and multi-layered phenomena such as value networks require several means of data collection and analysis.

A multi-method approach does not necessarily require interaction between the different methods (Mingers, 2001). The importance is that the different methods are applied to different aspects of the phenomenon studied in order to generate a comprehensive understanding of complex phenomena. Interviews are part of most interpretive studies. Even though interviews are a rich source for interpretations, they should be supplemented with other sources (Walsham, 2006). In this interpretive study we have used a number of different data collection methods including interviews, workshops, documents, and questionnaires. The last mentioned may require a special comment in relation to interpretive research. Quantitative data are according to Walsham (2006) perfectly valid input to an interpretative study. Quantitative results can be interpreted as a social construction (Mingers, 2001).

By using different data collection techniques and models for analysis in addressing different aspects of value networks we have expanded the scope and breadth of the research to generate a more comprehensive understanding. In doing so, we have to some extent been able to cope with the multifaceted nature of the phenomenon with the aim of expanding the theoretical understanding value networks in digital innovation.

4.4 DATA COLLECTION AND ANALYSIS

The different data collection activities in the DigiNews project and relation to papers are presented in Table 5 along the project timeline.
The individual papers of the thesis are based on the data collection activities marked with reference to the related papers (see Table 5). In the following, I will briefly present the different data collection and analysis methods used in this thesis. For more details on data collection and analysis I refer to the individual papers.

**Interviews** were used to assess interpretations from different stakeholders on different aspects and on different levels. Interviews were primarily used in newspaper organizations, where for example, respondents from management level were interviewed to get an understanding of business concerns on the organizational and industry levels. Newspaper staff from different departments such as editorial, and advertising department were also interviewed concerning their working domains. In addition, there were two interviews with advertisers and one with the project leader from the device producer. These interviews were conducted to get a deeper understanding of specific topics related to their areas.

**Workshops** were used primarily as a source to collect data about beliefs and expectations related to a future e-newspaper. Workshops were used with newspaper staff, newspaper readers, and advertisers. We chose to use workshops because of the interactive approach allowing us to not only interact with participants but also to observe and interpret how the participants acted and talked about the subject among each other. This allowed us to gain an understanding of their contextually-grounded social experience.

**Questionnaires** were used as a source to understand the perspective of a wide newspaper audience. All questionnaire data was collected among newspaper readers. The questions were operationalized from theory on different subjects. The questionnaires were tested and
revised with respondents to avoid misunderstandings and alternative interpretations of statements. The data was collected with online questionnaires at Swedish newspaper sites and stored in SPSS files.

*Project documentation* such as the project application and reports to ITEA, minutes of project meetings and steering group meetings, as well as correspondence between project partners during the project were also used for analytical purposes.

These data collection methods were used to gather rich data from the newspaper companies but also to provide an understanding form related stakeholders. The division of these data sources between different stakeholders is presented in Table 6.

<table>
<thead>
<tr>
<th>Actors</th>
<th>Data source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Publishers</td>
<td>30 interviews, 16 workshops, 8 focus group sessions, project meetings, project documentation</td>
</tr>
<tr>
<td>Readers</td>
<td>5 focus group sessions, 3 workshops, 3 user tests and interviews (19 respondents, 36 respondents and 12 respondents respectively), 5 questionnaires</td>
</tr>
<tr>
<td>Advertisers</td>
<td>3 workshops, 2 interviews</td>
</tr>
<tr>
<td>Device producer and technical solution providers</td>
<td>1 interview, project meetings, project documentation</td>
</tr>
</tbody>
</table>

*Table 6. Data sources related to stakeholders*

The collected data has been analyzed with different theoretical frames and different approaches depending on type of data. Qualitative data from for example interviews and workshops were analyzed using theory guided themes and coding to interpret meanings. Thematic coding was used with non hierarchical coding arrangements. The coding process was initiated using a priori codes based on themes informed by examining literature that also guided the data collection. Transcribed data material was marked with assigned colors for data categorization. In the coding process, new themes also emerged from the data. When new themes emerged they were coded and applied to the whole dataset re-examining previous coding. The coding was based on identifying related key-terms and on examining similarities and contrasts of wording. All coding and interpretation was done in an iterative process with at least two researchers involved in order to ensure consistency. Respondents were in hesitant cases consulted about adequacy of interpretations of data. Data from questionnaires was analyzed using statistical methods. These methods include bivariate analysis such as correlation analysis and comparing variables cross groups as well as multivariate data analysis such as factor analysis. SPSS software was used in all quantitative analysis. The conclusions from the different analysis were input to the interpretations of the value network phenomenon as a whole. These interpretations were done on the basis of concepts from literature on networks in innovation. The relationship between the papers, data collection and analysis is presented in Table 7.
<table>
<thead>
<tr>
<th>Parts</th>
<th>Paper</th>
<th>Theoretical frame</th>
<th>Data collection</th>
<th>Analytical approach</th>
<th>Contribution from parts</th>
<th>Interpretive lens for the whole</th>
<th>Contribution from the whole</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value Network</td>
<td>1</td>
<td>Genre (Yates and Orlikowski, 1992; Shepherd and Watters, 1998) and actor network theory (Callon, 1986; Latour, 1992)</td>
<td>DigiNews Case</td>
<td>Thematic coding</td>
<td>Tensions in the formation of value networks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Value Network</td>
<td>2</td>
<td>Platform logic framework (Sambamurthy and Zmud, 2000)</td>
<td>Interviews (18) and workshops (9)</td>
<td>Thematic coding</td>
<td>Challenges of aligning new value networks in UME</td>
<td>Concepts of networks in digital innovation</td>
<td></td>
</tr>
<tr>
<td>Value</td>
<td>3</td>
<td>Model of value proposition dimensions (Clarke, 2001)</td>
<td>Interviews (18) and Survey (1388)</td>
<td>Thematic coding of interview data. Descriptive statistics and factor analysis of survey data</td>
<td>User vs. provider discrepancy of mobile service value dimensions</td>
<td>Model of value network configuration</td>
<td></td>
</tr>
<tr>
<td>Business Model</td>
<td>4</td>
<td>Context adaptation interrogatives (Abowd and Mynatt, 2000)</td>
<td>Interviews (15) and workshops (9)</td>
<td>Thematic coding</td>
<td>Balancing conflicting values of advertising in UME</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business Model</td>
<td>5</td>
<td>Business model construct (Hedman and Kalling, 2003)</td>
<td>Survey (3626)</td>
<td>Factor analysis and correlation</td>
<td>Emerging ubiquitous business model for media content</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business Model</td>
<td>6</td>
<td>Adopter categories (Rogers, 1995)</td>
<td>Survey (2976)</td>
<td>Comparative analysis of cluster groups</td>
<td>Initial target groups for digital media innovations</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 7. Data collection and analysis in relation to papers

Since the motive with mixing methods was to expand the scope of research and broaden the understanding of the phenomenon the use of the contributions from the different parts were designed as a multilevel approach (Mingers, 2001). This means that they were not designed as a sequence of studies one contributing with distinct input to the other, but rather as studies complementing each other with different aspects on different levels. Thereby, the various papers represent different parts of value networks on different levels and from different perspectives. They relate to the model of value networks according to Figure 11.
A summary of each paper is presented in the next section. As these papers are co-authored with colleagues there is good reason to present my own contribution to data collection and analysis in each paper. This is summarized in Table 8.

<table>
<thead>
<tr>
<th>Papers</th>
<th>My contribution</th>
</tr>
</thead>
</table>

Table 8. Authors contributions to papers
By synthesizing the contributions from the various papers addressing different aspects and reflecting on the contributions as a whole, a deeper understanding of the influence of digital innovation on value networks emerged. The theoretical base for the interpretations on a meta-level evolved over time in response to the empirical findings, as well as studies of current literature on digital innovation. The main contribution in the cover paper presented in section 5.4 is a model of value network configuration. The model was shaped through an iterative process between theory and empirical data and between the parts and the whole, guided by the hermeneutic principle.

4.5 Reflections on Research Approach

Conducting interpretive research (Walsham, 2006), it might be useful to reflect upon the extent to which my research can be justified in view of its tenets. Such self-assessment can take different forms (Klein and Myers 1999; Golden-Biddle and Locke 1993; Walsham 2006).

I have chosen to use the principles outlined by Klein and Myers (1999) in self-assessing my research. These principles are grounded in the fundamental principle of the hermeneutic circle. Table 9 presents a summary of the principles as presented by Klein and Myers (1999).

<table>
<thead>
<tr>
<th>Principles for interpretive field research</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The fundamental principle of the hermeneutic circle</td>
</tr>
<tr>
<td>This principle suggests that all human understanding is achieved by iterating between considering interdependent meaning of parts and the whole that they form. This principle of human understanding is fundamental to all other principles.</td>
</tr>
<tr>
<td>2. The principle of contextualization</td>
</tr>
<tr>
<td>Requires critical reflection of the social and historical background of the research setting, so that the intended audience can see how the current situation under investigation emerged.</td>
</tr>
<tr>
<td>3. The principle of interaction between the researchers and the subjects</td>
</tr>
<tr>
<td>Requires critical reflection on how the research materials (or “data”) were socially constructed through the interaction between the researchers and participants.</td>
</tr>
<tr>
<td>4. The principle of abstraction and generalization</td>
</tr>
<tr>
<td>Requires relating the idiographic details revealed by the data interpretation through the application of principles one and two to theoretical, general concepts that describe the nature of human understanding and social action.</td>
</tr>
<tr>
<td>5. The principle of dialogical reasoning</td>
</tr>
<tr>
<td>Requires sensitivity to possible contradictions between the theoretical preconceptions guiding the research design and actual findings (“the story which the data tell”) with subsequent cycles of revision.</td>
</tr>
<tr>
<td>6. The principle of multiple interpretations</td>
</tr>
<tr>
<td>Requires sensitivity to possible differences among the participants as are typically expressed in multiple narratives or stories of the same sequence of events under study. Similar to multiple witness accounts even if all tell it as they saw it.</td>
</tr>
<tr>
<td>7. The principle of suspicion</td>
</tr>
<tr>
<td>Requires sensitivity to possible “biases” and systematic “distortions” in the narratives collected from the participants.</td>
</tr>
</tbody>
</table>

Table 9. Summary of principles for interpretive field research (Klein and Myers, 1999, p.72).
**Principle 1** is a meta-level principle that represents the fundament for human understanding. The fundamental principle of hermeneutics has been the basic principle that this research rests on in terms building an understanding by iterations between the parts and the whole.

The 2nd principle of contextualization is reflected upon in the section describing the newspaper industry as well as in several of the individual papers as far as the newspaper industry setting is concerned. This description aims at providing the academic audience with the background needed to understand the current situation in the newspaper industry. Further, presenting the literature on ubiquitous computing is intended to provide an understanding for the emerging digital innovation space. These two backgrounds form the starting point to understand the changes to value networks influenced by digital innovation situated in the newspaper industry. The understanding of how value networks are influenced is grounded in the history as well as in studies of the present, and interpretations of how activities produce new emergent structures.

Reflecting on **principle 3** involves reflecting on my interactions with the research subject as an IS researcher. This reflection is related to the discussion of authenticity by Golden-Biddle and Locke (1993). Authenticity refers to being genuine to the field by conveying that the researcher has “been there” and that the researcher’s understanding is genuine to the field. In the DigiNews project the Media IT group interacted very closely with the participants from newspaper companies. We have paid many visits to different newspaper sites for conducting interviews, workshops, and tests. During our visits we have also socialized with newspaper employees in their everyday work settings. Further, the project meetings have given us opportunities to socialize with participants from several different organizations and participate in their interactions about the newspaper industry. Involvement is according to Walsham (2006) a spectrum of different styles and it changes often over the time the research is conducted. In this research I have in some periods been very actively involved in representing the newspaper organizations interest in the value network. At other times the style of involvement has been more of a neutral interviewer within the newspaper organizations in the meaning of not representing any specific newspaper organization or any specific interests within the newspaper organizations. As understood from the above, we have built up very close relationships with the participating newspaper organizations in DigiNews. As a consequence, we sometimes experience the disadvantage of losing the benefit of a fresh outlook as discussed by Walsham (2006). This can be exemplified by our self reflection on our participation in the DigiNews meetings, where we afterwards realized that we sometimes interpreted discussions more from the viewpoints of the newspaper organizations interest than from our own research contribution. However, in the process of looking back at my research process in writing articles and this cover paper I have been able to hold a critical distance.

The 4th principle regards abstraction and generalization. In interpretive studies, theory is important as a “sensitizing device to view the world” (Klein and Myers, 1999, p. 75). Depending on the focus of different studies of parts, different theories and methods have informed the analysis. In each case, we have carefully related details of the studies to the general conclusions made. For example, this has been done by using quotes from interviews
and workshops mediating observations in the respondents own language to link details from the studies to the abstractions or generalizations made through theoretical lenses. In iterating between understanding the individual details and understanding the phenomena as a whole, following the hermeneutic principle, further conceptualizations have been made presented in this cover paper. The logical reasoning leading to these conceptualizations are clearly linked to each individual paper in order to present the reader with the possibility to follow the abstractions to the details.

Next, principle 5, referred to as dialogical reasoning, is related to the description of the philosophical underpinnings of this research. In clearly stating the roots and underlying interpretive perspective behind this research, the reader is presented with the fundamental stand of this research. The involvement in interpretive research is not value-less, rather the interpretations rest on researchers’ prior assumptions, beliefs, values, and interests that influence the research (Orlikowski and Baroudi, 1991). In the studies the engaged researchers have continuously discussed how data was analyzed and interpreted. In these discussions we have been alert on our own beliefs and if these beliefs are consistent and relevant to the conclusions. Further, we have not limited interpretations to theoretically informed concepts but also let new themes emerge.

Principle 6 regards multiple interpretations of data. During the three years that we were involved with the newspaper companies in these studies we have revised our preconceptions as a result of revealing conflicting interpretations. These conflicting interpretations have been revealed within single organizations, between different newspaper organizations and between different actors in the DigiNews project as a whole. In fact, one of the papers (paper 1) included in this thesis presents several conflicting interpretations. These conflicting interpretations have also been the source of some of the conceptualizations of value networks in digital innovation presented in this cover paper. One example is the conflicting interpretations between the participants in the project of the value of an e-newspaper to the media consumer customer and to the advertising customers.

Finally, in taking principle 7 into account, I will just shortly comment on the strong culture within the newspaper industry. Newspapers have a long history with relatively little change. Given this there are a number of beliefs or common “truths” that often influence discussions. Interestingly, these “truths” are internationally shared as we have experienced them within DigiNews but also in our interactions with newspaper representatives at international conferences with participants from all parts of the world. After taking some of these “truths” into account in our studies we have been able to understand that they are historically inherited rather than grounded in the present. In fact some of the slow innovation capability in the newspaper industry could have its explanation in some of these beliefs.
5. Research Contributions

This thesis builds on a collection of published journal and conference papers that have been peer-reviewed by the international community of scholars. In addition, the cover paper synthesizes these contributions into a coherent and relevant perspective on value networks in digital innovation. In particular, I present a conceptual model of value network configuration and a set of related implications.

This section first summarizes each individual paper and provides an overview of how they are linked to the overall contribution of the research. Thereafter, I also present related papers, which report results from the DigiNews project that have influenced my understanding. Following the paper presentation, I discuss the influence of digital innovation and the emerging UME on value networks in the newspaper industry. Lastly, the model of value network configuration in digital innovation and implications for research and practice are outlined.

5.1 Summary of Research Papers
The paper presentation is organized according to Figure 11 (see section 4.4) presenting the relationships between value network, value, and business model. The summaries are based on the primary focus of each paper but there are overlapping discussions between the three themes.

Value Networks

Paper 1 – Tensions in forming value networks

The first paper addresses the process of forming a new value network in digital innovation. In this paper concepts from genre theory were used as a tool to understand the characteristics of the digital innovation and a set of concepts related to actor network theory to capture the process of network formation. Based on the DigiNews project as a case, empirical data from interviews, workshops, focus groups, surveys, project meetings, project documentation, and user tests were analyzed. The aim was to understand how the negotiations between different stakeholders, e.g. newspaper publishers, device producers, readers and advertisers, unfolded in forming a value network around the e-newspaper. The insights from the DigiNews project show how the value network created around a digital innovation is dependent on the convergence of different interests. The pattern of negotiations revealed that there are opposing forces in play. On the one hand the actors are striving to mobilize for example new actors, competences and customer bases in an open network. On the other hand, strong actors are striving to become an obligatory passage point and stabilize the network by taking a focal actor position in a more closed and fixed network. In the DigiNews case these forces resulted in a dead-lock situation between the device producer and newspaper publishers as both strived after taking the focal actor position in the value network.

**Paper 2 – Challenges of aligning new value networks with existing in UME**

This paper investigates the challenges of aligning a new value network with existing value networks. Drawing on a study with newspaper publishers in Sweden, Belgium, France and the Netherlands consisting of 18 interviews and 9 workshops this paper demonstrates that content providers publish in multiple channels and thereby they also exist in a multitude of infrastructures. On the basis of the platform logic framework (Sambamurthy and Zmud, 2000) the analysis shows that each infrastructure has its value network, which in turn means that content providers exist in many parallel and interrelated value networks. The findings show that value networks in multiple channel publishing environments are closely related to infrastructure. The nature of UME will have implications on value networks openness and flexibility. Value networks will need a fluid and flexible structure to cope with changes in very short cycles. The heterogeneity and dynamics of value networks will increase in UME.


**Value**

**Paper 3 – Content provider vs. media consumer discrepancy of mobile media service value dimensions**

In this paper the content provider and consumer value perceptions of mobile media services is compared using a model of value proposition dimensions of mobile commerce (Clarke, 2001). The content provider perceptions were analyzed from an interview study with 18 newspaper publisher representatives. The media consumer perception of value was analyzed from a dataset of 1388 media consumers who regularly use mobile media services. The findings show that there are similarities as well as differences in perceptions of value held by content providers and media consumers of mobile media services. Content providers perceived media consumer value dimensions to be ubiquity, localization, personalization, convenience, and content provider/consumer relationship. The analysis of media consumer perceptions revealed that ubiquity and service provider/user relationship were perceived as general service characteristics by media consumers rather than value dimensions. The value dimensions were identified as localization, personalization, convenience and socialization. This paper demonstrates that mobility indeed is a strong value driver in media. However, it also highlights a disparity between content providers’ assumptions of customer value and customers actual value perception. For example, social values were a much stronger value dimension than publishers expected. These findings show that value is redefined and that the value drivers identified in UME leads to an increased divergence of media services.
COVER PAPER


Paper 4 – Balancing conflicting values of advertising in UME

UME offer new opportunities for content providers to innovate advertiser customer value. This paper explores the opportunities with ubiquitous advertising based on interviews and workshops with 20 advertisers and 34 content providers. There are indeed many new promising values to offer advertiser customers such as increased reachability, targeting individual customers, tailored advertising, enhanced interactivity, tracing and tracking information etc. With this prospect in view, this paper discusses how content providers relation to customers in the value network is changing. On the basis of context adaptation interrogatives (Abowd and Mynatt, 2000), the increased complexity of balancing media consumer and advertiser values is highlighted. This paper contributes with an increased understanding of the implications on value brought by the heterogeneity, diversity and, dynamics in UME.


Business Models

Paper 5- Emerging ubiquitous business models for media content

Using the e-newspaper innovation as an example, this paper shows that there indeed are new emerging structures for business models in UME. This paper presents a business model framework for future e-newspapers based on customer preferences. The findings are based on a survey among media consumers with 3626 respondents. After a presentation of the newspaper innovation the respondents were asked questions drawing on a business model construct (Hedman and Kalling, 2003). Through a factor analysis, three aspects of consumer preferences were identified: ubiquitous access, prestige of news source and local anchorage and advertising. These were thereafter correlated with media consumer behavior and e-newspaper preferences indicating three possible market segments matching these aspects. The paper suggests an integrated business model framework consisting of three models, i.e. ubiquitous, local, and prestige models, with the ubiquitous model as a new emerging model. This ubiquitous business model is more customer pull oriented and brings increased diversity due to heterogeneity of for example devices, use-situations, and customer profiles.

Paper 6 - Initial target groups for digital media innovations

The sixth and final paper explores how different groups of media consumers differ with respect to the adoption of new innovative digital media services. Data was collected from in total 2976 respondents through the web sites of three Swedish newspapers on the theme of media consumption, technology use, and preferences of media products and services. Based on a set of key questions, the dataset was split in four groups in the analysis; early adopters, active media consumers, engaged media consumers (i.e. those who were identified as both early adopters and active media consumers), and finally, those who did not fit in any of the previous categories. A comparative analysis was conducted between these four groups in order to identify and explore important media consumer groups that can be used as initial target groups for media innovations. The engaged media consumer group proved to have stronger preferences than the other three groups and emerged as a very interesting initial target group for new digital media innovations. The paper expands the existing framework of early adopters (Rogers, 1995), which is closely to the technological aspects of a product, by including users that are more interested in the social and content-related aspects of media services. This paper shows that the adoption drivers of digital media innovations do not distinctly separate technology and content. Digital media innovation adoption is influenced by several innovation layers such as service, device and distribution. This paper demonstrates that the business models strategies for market diffusion would gain from a more inclusive view of an innovation than in traditional diffusion of innovations literature in recognizing that adoption of digital media is increasingly dependent on media content.


5.2 Related Research Papers

Given the focus of this thesis, the articles included in my analysis of value networks in digital innovation represent a subset of the research conducted in the DigiNews project. There are also related papers that report from the development and design of the e-newspaper that have influenced me during the project as I have been engaged in the empirical studies as well as co-authored the papers. Thus, these papers also manifest my research process as a PhD student. I have written the following papers that were deemed to be overlapping or outside the scope of my focus in the thesis (see Table 10), and therefore not included as contributions.
<table>
<thead>
<tr>
<th>Paper</th>
<th>Year</th>
</tr>
</thead>
</table>

**Table 10. List of additional publications related to the DigiNews Project**
5.3 Influence on Value Networks

Even though the development and design of the e-newspaper is not the focus in this thesis, there is reason to comment on the e-newspaper as a digital innovation since it is around this innovation that value networks, value and, business models emerged. The e-newspaper innovation can be regarded as the result of a wake (Boland et al., 2007) of innovations starting with the enabling E ink technology, the application of E Ink technology in e-paper display technology, and the application of e-paper in reading devices (see Figure 12).

![Figure 12. Innovation wake](image)

Given this, the e-newspaper innovation is dependent on multiple layers of complementing innovations and can thus be regarded as a systemic innovation system (Maula et al., 2006). In DigiNews, the two top layers were represented: the e-newspaper and the e-reader. The e-reader was primarily represented by the device producers and the e-newspaper by newspaper organizations, both complementing each other. For example, the value of an e-reader would not be realizable without media content, and in turn, the e-newspaper concept is dependent on the architecture of the e-reader product system. In other words, the e-newspaper innovation is linked to a larger business system spanning not only organizational boundaries but also technological paradigms and industry boundaries.

The e-newspaper innovation has in this research been in focus to understand how digital innovation influence value networks. In synthesizing the results from the different papers in this section Figure 13 presents a summary of how digital innovation and the emerging UME has influenced value networks of newspapers drawn from the parts presented in the papers. The influence of digital innovation on value networks is discussed with reference to literature on networks in digital innovation and examples from the DigiNews project.
**Figure 13.** Overview of results from the individual papers

Influence on value network

Digital innovation has clearly influenced value networks in the newspaper industry. As shown in the DigiNews case (paper 2), the emerging heterogeneous technology and business environment drive value networks into new structures in line with the observations by Yoo et al. (2009). The emerging structure is characterized by heterogeneous knowledge bases and distributed control. The e-newspaper for example, is a result of bringing knowledge from the newspaper industry together with knowledge from applied digital technology. Adding to the complexity there is a strong trend and escalating digitization of media content. In the newspaper industry case, it has been observed that traditional media still exist in parallel with new media innovations, and in networks crossing organizational and industry boundaries, as well as spanning over several innovation layers. This leads to newspaper organizations existing in an environment characterized by multi-layered heterogeneity and existence in multiple parallel networks (paper 2). These networks differ in character depending on the type of and maturity of media innovation but they also differ in character depending on types of knowledge and control (Yoo et al., 2009) and types of relational ties (Simard and West, 2006). As opposed to traditional media such as the printed newspaper, new digital media are associated with networks with heterogeneous markets, distributed control over network and business model, and wide and informal ties in the network. As can be observed in the DigiNews case, long term relationships exist in parallel with temporal relationships and participation by network members is at times fluid (paper 2).
Further, the structure of value networks is not static (Christensen and Rosenbloom, 1995), in the newspaper industry it can be observed that value networks changes in shorter cycles as a consequence of digital innovation (paper 2). The DigiNews case also demonstrates that there are contradictory forces to value network changes (paper 1) in line with observations from other industries (Henfridsson et al., 2009; Jonsson et al., 2009). On the one hand there are driving forces to mobilize for example new actors, competences, markets in an open and flexible network. On the other hand, strong actors are striving to stabilize the network by establishing themselves as obligatory passage points taking control over the value network (paper 1). This is corresponds with the observation by Van de Ven et al. (2008) that there is convergent as well as divergent behavior in innovation. These contradictory forces of mobilizing and stabilizing create dynamic changes with actors continuously entering and leaving the value network, as observed by Yoo et al. (2005) in the telecom industry.

**Influence on Value**

The emergent divergence and heterogeneity brought by UME is indeed very challenging for value creation (Fleish and Tellkamp, 2006). The character of UME with converging technology leads to a great divergence in services and service distribution. This means that value cannot always be pre-defined but rather created in real-time use. Value in UME is a synthesis between the content, the device and how it is distributed in relation to the context (paper 3). Consequently, value creation is required to be dynamic and contextually adapted to the user’s situation (paper 4). In UME, value creation is increasingly distributed across diverse contexts. Thus, value creation is exceedingly context dependent (Abowd and Mynatt, 2000), likewise customer perception of value is context dependent (paper 3) thereby redefining value dimensions of ubiquitous media. The observations from DigiNews show that this applies for media consumers (paper 3) as well as advertiser customers (paper 4) in newspaper industry. The dyadic customer base of media industry also leads to very challenging balancing of conflicting values (paper 4). Still customers, whether media consumers or advertisers, are vital in co-creating value and are also potential sources of new innovations (Stabell and Fjellstad, 1998; von Hippel, 2005). Accordingly, the relationship to customers is becoming of increasingly strategic importance in the value network.

**Influence on Business Model**

Business models in UME are characterized by high complexity. Not only are the business opportunities related to UME very challenging (paper 5), but they are also forcing the system of innovation levels from a hierarchy of supplier and customer relationships to a network of co-opetition relationships (Van de Ven, 2008; West, 2007). One obvious example from the DigiNews project is the relationship between the device producers and the newspapers. Historically, these two actors have not had any relationship since content and devices have not been coupled in value propositions or in business models. In DigiNews, both had motives to connect content and device. The motive from the device producer was to enable value of an e-reader with quality media content. For the newspapers the motive was to influence the development of a digital device suited for newspaper content in order to design value propositions incorporating a newspaper dedicated device (paper 5). The
linkages and roles between different stakeholder’s value capture defined by the business model are migrating and a co-dependence of roles in the business model is emerging. In the DigiNews project this was reflected on the device producers intending to sell newspaper content through their content management system and the newspaper organizations intending to sell devices branded with the newspaper brand. Further, the convergence of technology and media leads to a pull oriented nature of a service architecture in UME (paper 5). Reaching anyone, anywhere, in any device, at anytime with any content and adapting content to the use situation leads as described earlier to redefined value drivers. Consecutively, the divergence and heterogeneity of customer needs and customer bases concerning media consumers as well as advertisers increase. In turn, this requires reassessing customer target groups and markets (paper 6). As a result, new market knowledge is required from new external resources (Vanhaverbeke and Cloodt, 2006) thus creating a need for heterogeneous knowledge resources. Heterogeneous knowledge bases drives new digital innovation (Yoo et al., 2009) as also observed in the DigiNews case. This leads to changing business models and disruption of value creating competence and market linkages (Abernathy and Clark, 1985). In DigiNews, the business model emerged as the most challenging issue in negotiations since the e-newspaper challenged traditional business models in newspaper industry as well as the appliance industry. The concept of the e-newspaper was indeed challenging to their strong brands and identities within their industries respectively. The different organizations all had their interpretation of business models. Especially, the relationship to end customers was the most challenging to agree on. Not in respect to optimize customer value but rather to secure strong positions in the value network. In the DigiNews case this led to the newspaper companies and the device producers not agreeing on business models. This highlights the competition side of the co-opetition nature of value networks in digital innovation in line with the discussion by Van de Ven et al. (2008).

In summary, this research demonstrates that digital innovation indeed influences value networks in the newspaper industry. First, it is highlighted that value networks in digital innovation are dynamic and exist in multiple layers and in parallel. For example, value networks related to the printed newspaper exist in parallel with networks related to on-line newspapers, to mobile news services, and the emerging networks related to e-newspapers. Second, the empirical analysis unfolds the dialectic nature of change in mobilizing and stabilizing efforts. For instance, newspaper organizations are engaged in mobilizing new partners and seek new business in digital media innovation, at the same time they are putting effort into stabilizing their position in the new emerging networks. Third, it is demonstrated that there are diametrically different structures of value networks with convergent structures related to more mature media and divergent structures related to new digital media innovations. For example, the value networks related to mature media services such as the online newspaper are characterized by centralized control, homogenous knowledge bases and well established ties. The emergent networks related to e-newspapers in the DigiNews case is on the other hand characterized by heterogeneous knowledge bases and fluid participation. These networks are interrelated but still have very different structures.
This highlights the complexity related to organizations existing in multiple value networks at different levels and of very different structures and reconfigured through dialectic processes. There is indeed a need to understand how value networks are reconfigured. The model of value network configurations presented in the next section is an attempt to conceptualize such an understanding.

5.4 The Model of Value Network Configuration

On the basis of conceptualizations of networks in innovation (see e.g. Yoo et al., 2009; Van de Ven et al., 2008; Vanhaverbeke and Cloodt, 2006; Chesbrough and Rosenbloom, 2002) and the observations from digital innovation in newspaper value networks, this thesis presents a model which I term the model of value network configuration.

Important concepts of the model of value network configuration are: value networks in movement, directions of movement and the structural poles between which value networks move. Value networks in movement refer to value networks being dynamic and in continuous change. Directions of movement refer to value networks moving back and forth in two dialectic directions through change by the conflict of the opposing forces of mobilizing and stabilizing. Lastly, structural poles refer to the diametrically opposite structures, convergent structure and divergent structure that value networks move between. These three concepts form a set of components building up the model of value network configuration. The model as depicted in Figure 14, consists of a) the model of value network with interrelationships to business model and value, b) two dialectic directions of movement – mobilizing and stabilizing, and c) two diametrical poles – convergent structure vs. divergent structure.

![Figure 14. Model of value network configuration](image-url)

Component a) value network

Component a represents value network and the interrelationship with value and business model. The interrelationship between these is centered on innovation. The role of the value network is to realize innovation value through the business model embedding the value creation and the relationships within the value network. The relationships within and
between value networks are characterized by co-opetition. Further, value networks are multi-layered and exist in parallel. For example, one organization can participate in several value networks that exist in parallel and in hierarchies related to different digital innovations. These parallel networks can be positioned differently between the diametrical structures. Value networks continuously and dynamically change and thus move between the different structures. The movement of a value network can be triggered or amplified by for example innovation on another innovation layer, influences from outside the value network boundaries such as radically changed competition, from informal ties within the network, and from customers within the network. The movements of value networks may be of very different pace, the more divergent structure, the faster pace in shorter cycles. The degree of movement an innovation requires in and between value networks is related to type of innovation. Regular and incremental innovations are more related to convergent structure whereas architectural and radical innovations are more related to divergent structure. This model confirms that value networks are multi-layered and in constant dynamic change through their existence.

Component b) mobilizing and stabilizing
Component b reflects the directions of movement of value networks in two directions. These directions are driven by two dialectic processes, mobilizing vs. stabilizing. Mobilizing refers to divergent behavior of for example mobilizing new market knowledge, new customer bases, new actors from areas outside the focal actor’s traditional cooperation and competition. These efforts cause movement of the value network towards divergent structure. Stabilizing refers to convergent behavior by for example stabilizing the structures of the value network by centralizing control, defining customer bases, standardizing business model structure, and formalizing and deepening ties with actors with aligned interests. Stabilizing efforts initiate movement towards convergent value network structure. The co-opetition in value networks adds to this dialectic relationship by the need for securing the advantage of participating in the network is greater than participating in competing networks. Each time participants enters or leaves the network the stability is shaken. Moreover, the greater the uncertainty in value creation, the greater uncertainty in network relations there are. Architectural and radical digital innovation, at least initially, are characterized by this uncertainty and starts movements towards divergent network structure. We can expect more mobilizing efforts the more radical or architectural an innovation is and the more experimental the business model is. On the other hand, we can expect more efforts to stabilize as an innovation is changing its role in the value network. Over time, an innovation that was architectural can change in its meaning to the network, as the technology matures efforts to standardize and clearly defined value creation, business models and relations will initiate stabilizing movement towards convergent structures. This model suggests that value network reconfiguration is dialectic.

Component c) convergent structure vs. divergent structure
The convergent and divergent structures form a set of diametrical structures of value networks. The convergent structure is characterized by formal and deep network ties,
centralized coordination and control, homogenous knowledge resources, and entrenched market linkages and value creation competence. Typically, value networks far to left in the model are associated with incremental or regular innovation. The values are mature and well known and the competence required in value creation is entrenched. The divergent structure is characterized by informal and wide ties, distributed coordination and control, and disrupted market linkages and value creating competence. Value creation and market knowledge is disrupted by radically new technologies or business concepts. New emerging value networks centered on architectural and radical digital innovation start from the right, and as the innovation is diffused and adopted and the technology and market matures, the value network will move towards the left. The more convergent the structure is the more stable it is, until it is challenged or disrupted. The more divergent structure the more uncertainty there is in the value network but also the more flexible and susceptible it is to changes in the environment. The model suggests that value networks configuration is **diametrical**.

The model of value networks configuration proposed in this thesis, explains that the dialectics between convergence and divergence of value networks is driven by two processes: mobilizing and stabilizing. In the model, value networks are understood as dynamic, multi-layered, dialectic, and diametrical. Table 11 summarizes the nature of the components in the model of value network configuration.

<table>
<thead>
<tr>
<th>Component</th>
<th>Nature of component</th>
<th>Observation from DigiNews</th>
</tr>
</thead>
<tbody>
<tr>
<td>a Value network</td>
<td>Value networks are multi-layered and exist in a system of interwoven innovation layers, and dynamically change and move between different structures</td>
<td>Multiple interconnected value networks related to e-paper, e-readers, e-newspapers etc.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Newspaper organizations existing in traditional publishing value networks in parallel with new value networks in digital media, for example value networks related to printed newspapers in parallel with e-newspaper value network.</td>
</tr>
<tr>
<td>b Mobilizing and stabilizing</td>
<td>Mobilizing and stabilizing are two dialectic processes that rule the movement between convergent and divergent structures.</td>
<td>Efforts to open networks and engage with new technologies, actors and identify new markets were observed. When business opportunities became clearer efforts to take control and stabilize for example business models, value and relations were observed.</td>
</tr>
<tr>
<td>c Convergent and divergent structure</td>
<td>Convergent and divergent structures are two diametrically different structures that value networks move between.</td>
<td>Value networks related to traditional media such as printed newspapers were observed to be stable, fixed relationships, well defined value and business models etc. Value networks related to new digital media were observed to be more open and flexible with more external relationships and fluid participation. Value and business models more flexible and variable.</td>
</tr>
</tbody>
</table>

Table 11. Components of the model of value network configurations
The model of value network configurations affords examining digital innovation from innovation process to market. Focusing on networks instead of single organizations efforts to diffuse innovations allows more balanced analysis of digital innovation not limited to the boundaries of organizations or markets. The model of value network configuration is intended to explain key aspects of the value network in digital innovation phenomenon and the relationships and interactions between these key aspects. This view of value networks encourages analysis of value networks processes through which value networks are reconfigured. There are a number of research implications as a result of the model of value network configuration.

5.5 RESEARCH IMPLICATIONS
The research in this thesis was conducted during a three year period following the DigiNews project. Naturally it is very challenging to summarize all the insights gained during this time. The individual papers following this cover paper represent some while others are presented in related papers (see Table 9). Here, I will discuss the research contribution provided by the model of value networks configuration in digital innovation presented in the cover paper.

5.5.1 IMPLICATIONS FOR THEORY
This research contributes to the research on digital innovation in information systems by portraying a new way of understanding the complex nature of value networks in digital innovation. In addition to understanding value networks as multi-layered and dynamic, this thesis suggests understanding value networks as dialectic and diametrical. Attempting to broaden the knowledge of this phenomena I here make the following propositions.

Proposition 1: Recognizing value networks in digital innovation as multi-layered helps us understand linkages in and between value networks.

The multi-layered nature of value networks in digital innovation is largely related to the systemic character of digital innovation and closely related to the business model. Adding to previous literature recognizing the multi-layered nature of value networks (Christensen and Rosenbloom, 1995; Maula et al., 2006) this research shows that organizations participate in parallel networks with different positions and that the meaning of the digital innovations is interpreted differently by various participants in different positions in the value network. Analysis of value networks not taking this multi-layered nature into account runs the risk of missing out on linkages outside a single value network context that influence the behaviors and structures within the value network under study.

Proposition 2: Recognizing value networks in digital innovation as dynamic helps us understand patterns of change.

The main components and the relationships in a value network can be regarded as relatively stable if studied at one point in time. Confirming previous research (Christensen and Rosenbloom, 1995; Van de Ven et al., 2008) this model recognizes that value networks constantly change during their existence. Rather than regarding value networks in digital innovation as changing in a linear mode or evolving uncertainly according to ad hoc
Proposition 3: Recognizing value networks in digital innovation as dialectic helps us understand points of tension and instability in the networks.

The dialectic attribute suggests that value networks in digital innovation are characterized by complex co-dependencies as suggested by previous research (Vanhaverbeke, et al., 2006; Simard and West, 2006; West et al., 2006). Further there are contradictions between established structures and new configurations brought by digital innovation (Henfridsson et al., 2009; Jonsson et al., 2009). This work shows how this leads to contingencies of contradicting efforts of mobilizing and stabilizing. In attempting to understand this constant change, this research suggests that it is fruitful to distinguish analytically between mobilizing activities causing changes that move the network towards divergent structure, from stabilizing causing changes that move the value network towards convergent structure. While digital innovation encourages a movement towards a divergent structure, business negotiations have been shown to be invoking movement towards convergent structures. Not recognizing this attribute in analysis of value networks would provide a limited view of the sources of tension and instability in value networks.

Proposition 4: Recognizing value networks in digital innovation as diametrical helps us understand managerial challenges in digital innovation.

The diametrical attribute suggest that the dimensions along which these opposite structures take form presents a wide spectrum of different value network structures as discussed in previous research (Abernathy and Clark, 1985; Simard and West, 2006; Yoo et al., 2009). This work contributes by illustrating that organizations concurrently participate in multiple interconnected value networks which challenges management since different structures call for differing managerial capabilities. The diametrical attribute imply a need for understanding the need for dynamic managerial capabilities in digital innovation.

5.5.2 Implications for Practice

Clearly, the newspaper industry is in the midst of disruptive change. The development towards UME is pushing value networks of newspapers towards divergent structure while the value networks related to mature media are more convergent. For management of focal organizations to plan and organize value networks these are very important insights. The same strategy cannot apply to all structures of value networks. Up until today, innovation efforts in the newspaper industry have been highly directed towards technology and not so much on business model and value network levels. An increased awareness of how value networks are influenced by digital innovation is hopefully useful for newspaper industry to bring the core of newspaper value into the digital era.
Some concrete proposals can also be made. In view of the background of newspaper industry presented in section 2, there are some observations that can be of guidance for newspaper industry on their digital journey. First, there is indeed a pressing need for newspaper stakeholders to continue and intensify digital innovation efforts, and prioritize efforts on innovating value and business models relating to media consumers as well as advertising customers. In this course, it is important to recognize that value drivers are a moving target. The era when a business model can last as long as the printed newspaper model has, is most likely history.

Second, newspapers would benefit from thinking less in mass-media and more in relational and experience media. Media consumers have high expectations on media experience and advertising customers on connecting to markets. Thereby, I would argue, it is more important to know your customer than to own your customer.

Third, there is a need to open the innovation culture to a networked innovation environment. In this spirit, newspaper companies would gain from recognizing the strategic advantages of co-opetition also outside industry boundaries.

My fourth and last proposal regards re-thinking the identity which still today is very closely related to the paper news is printed on. Newspapers have very high competence as quality content providers but need to develop their mindsets on the relation between content and the media through which the content is made available. This research gives guidance towards a direction where context is put in focus rather than publishing channel. Newspaper brands are very strong content brands. It can be expected that the development towards UME will make content brands more important since media devices without content are uninteresting. With media constantly present in our every-day lives, people are likely to turn to trusted brands. If so, this could be the start of a golden era for content providers. However, this is not to say media consumers are willing to pay for content unconnectedly since value is dependent on a synthesis of several layers, for example the unity of content, presentation and distribution. As affirmed in this thesis, there is a need for business model innovation.

As a final point, these proposals are naturally not to be regarded as a roadmap for success. Each newspaper is an individual in the industry and has specific circumstances to put these proposals in relation to. Be that as it may, I hope they can be useful to nourish fruitful discussions of newspaper’s future innovation paths.

5.5.3 Directions for Future Research

There are several implications for future research coming out of this thesis. First, future empirical work is needed to develop, revise and confirm the proposed model. This could be done by expanding the empirical context to other industries and to other types of innovations. By studying the influence of digital innovation on value network configuration in other contexts, the results from this thesis can be further developed and expand the basis for validation and generalization. Especially significant is to pay more attention to the
linkages between different network layers and between different levels in the network architecture.

Further, the model of value network configuration does not directly take in hand how the different structures of value networks interact. Future research could analyze the relationships between different value network structures more in depth, especially networks with overlapping participation and the relation to type of digital innovation.

Especially interesting is to determine the forces underlying mobilizing and stabilizing behavior and how these drivers interplay in order to deepen the understanding of value network configuration. Since there is a strong convergence trend in media industry this topic is very timely.

Lastly, this research was conducted in a setting where we were fortunate enough to follow the emergence of a new value network. Conducting studies of value networks over a longer period of time would deepen our understanding of the phenomena and result in advanced theoretical insights of value networks.

There are naturally limitations to this research. One is that it has been conducted with the newspaper industry as the focal actor meaning that concepts of value networks, business model and value have been interpreted through this industry lens. Another is that the research did not include all layers of the systemic e-newspaper innovation. Furthermore there are alternative methodologies that could be applied to examine the influence of digital innovation on value networks. For example, in depth industry case studies with longitudinal data could generate deeper understanding and theoretical insights.

Even so I believe that the suggested models are abstracted in the conceptualizations in such a way that they may be utilizable in other settings where value networks in digital innovation are of research interest.
6. CONCLUDING REMARKS

The model of value network configuration is intended to highlight key aspects of the value network phenomenon and suggest typical relationships influencing value networks in digital innovation. This intention is a corollary of the research question: *How are value networks of newspapers influenced by digital innovation?* Firstly, this thesis presents theoretical concepts and their relations applicable to understand value networks in digital innovation. These are presented as a) a model of value networks nature, b) aspects of value network dynamics, and c) dimensions of value network structure. Secondly, the influence of digital innovation on value networks was demonstrated with the development towards UME in the newspaper industry. Finally and most importantly, this thesis proposes a theoretical perspective with which to understand how digital innovation influences value networks. This perspective is instantiated as a model of value network configuration. The model emphasizes the multi-layered, dynamic, dialectic, and diametrical character of value networks in digital innovation.

The proposed model of value network configuration can inform future investigations of value networks in digital innovation along the proposed theoretical implications of this thesis. Focusing on value networks may allow deeper insight into the inherent complexity and uncertainty involved in future digital innovation. The research in this thesis challenges current ways of understanding value networks as a single construct. The model of value networks configuration can serve as a basis for developing a richer understanding of value networks in digital innovation by providing a vocabulary and analytical tool to explore the nature of value networks in digital innovation.

I strongly believe that we are merely in the beginning of the digital era. The benefits and consequences of digitization are probably up to now only observable on the surface. In this thesis the digitization of newspapers has served as an example. Newspaper publishing and the newspaper industry has been very stable and fairly unchanged for hundreds of years. Now, it is shaken in its foundations by digitization. However, the core value of newspaper publishing is not to my firm belief the print on paper but quality content and high integrity. These values are not outdated in the digital era and UME which I am confident e-paper will be part of in more developed forms. How the newspaper industry and newspaper publishing will participate in future value networks of UME and e-paper platforms will probably be shaped by actions taken in the near future.

It is therefore a privilege to be able to continue this line of research within the newspaper industry. The Media IT research group at Halmstad University has been invited and will take part in the formation of the International e-Reader Association (IeRA) initiated by American newspaper companies. The IeRA initiative is aiming at an open innovation process and formation of value networks of newspaper publishing on e-paper platforms. The initiators therefore invite a broad spectrum of international actors to participate such as newspaper companies, device producers, technology developers, service providers, software
companies, and academic institutions. The role of the Media IT group in the IeRA will be to coordinate the academic research within the association. Further, the Media IT group is engaged with a group of local Swedish newspapers in a two year project to explore future engagement of users in local social media with an open innovation approach. Thereby I can conclude this thesis by saying: it now begins.
REFERENCES


**INTERNET REFERENCES**


FORMING A VALUE NETWORK – ANALYZING THE NEGOTIATIONS BETWEEN ACTORS IN THE E-NEWSPAPER CASE

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ABSTRACT
We have studied a two-year project aiming at exploring the potentials of the e-newspaper, i.e. a news service published with e-paper technology. Different actors have interests in this process, e.g. newspaper publishers, device producers, readers and advertisers. These actors are forming value networks by negotiations of interests and positions. The contribution of the paper is twofold: firstly we show how the value network created around e-newspaper is dependent on the convergence of different actors and their interests; secondly our theoretical contribution is to show how Actor Network Theory (ANT) can be used in combination with other theories - in this case genre theory - to analyze emergent value networks. ANT captures the general process of how the value network takes form, while genre theory captures the domain specific context of e-newspapers, and how this structures negotiations between different stakeholders who want to form the e-newspaper genre.

INTRODUCTION

Mobile business involves many different actors such as device manufacturers, content providers, network operators, payment agents, and users (Camponova and Pigneur, 2002; Lehner and Watson, 2002). These actors are forming value networks by negotiations of interests and positions (Vanhaverbeke and Cloodt, 2006). Value networks can be understood as the network of relationships between the stakeholders of a firm (Christensen, 1997). The strength of a value network is determined by the added value compared to alternative networks, and by the commitment from the participants (Vanhaverbeke and Cloodt, 2006). New innovations may cause the shaping of new value networks with different stakeholders (Christensen, 1997). Lately, a new technical innovation, e-paper technology, has entered the market with potentials for offering mobile services in a new way.

E-paper is a reflecting display technology with properties very close to print on paper in terms of contrast and readability. Different actors, such as media houses, device manufacturers, online stores etc., are today in the process of aligning themselves in value networks around this new news channel. This technology is of special interest to the newspaper industry due to its capabilities. A possible replacement of the printed paper in the long run would result in radically reduced production and distribution costs. From a newspaper industry perspective e-paper is not just a new technological platform, it is also a potential new mobile newspaper service published on an e-paper device, i.e. an e-newspaper.

An e-newspaper holds the potential of merging the best from two news genres: the readability and overview from printed newspapers and interactivity and multimedia from online newspapers. However, the process of creating a possible new news genre, i.e. the e-newspaper genre, also requires a new value network supporting the genre (Ihlström Eriksson et al., 2008). The primary research question therefore is: How are the interests of different actors converged in the forming of a value network around the e-newspaper?

In this paper we describe and analyze the convergence of different actors and interests around the e-newspaper, which would form a value network that would produce an e-newspaper genre. The convergence process took in this case the shape of a series of negotiations that took place within the DigiNews project (2004-2006) which aimed at exploring production, distribution and consumption of the future e-newspaper. Two theoretical strategies were important for this research when conducting the analysis. We used concepts from genre theory to describe the domain specific subjects that would lead to the creation of a potentially new news-genre, and concepts from Actor Network Theory (ANT) to analyze the more general process of how the value network emerged.
As a consequence we will in this paper discuss how this convergence process can be analyzed as the formation of a new genre. We will describe how it is developed, formed and stabilized in a negotiation and struggle between the involved actors when they translate their interests in ways that finally (might) result in the characteristics of the e-newspaper genre. Thus, the new business models and services developed around e-paper technology are related to the characteristics of the new genre, but also to the process of forming the genre, i.e. the convergence.

The e-newspaper genre is still in the making, and the case that is presented in this paper gives a unique possibility to study the different forces involved in the process of forming a value network around e-newspaper. In this process different actors negotiate their interests which lead to a convergence that eventually will result in both a new genre and creating a new market.

**THEORETICAL FRAMEWORK**

To support the analysis, two theoretical departures were chosen. Based on our previous research, genre theory had been proven a good theoretical tool to analyze the formation of e-newspapers (Ihlström and Lundberg, 2004; Ihlström and Henfridsson, 2005). Genre theory creates a possibility to analyze how a genre, here e-newspapers, emerges in a dynamic process leading to the creation of new forms, rules and functions that structure communication, i.e. a genre. Genre theory is here used as a tool to understand the characteristics of the innovation.

But this is not enough. The formation of the value network also has to be analyzed in a more actor oriented way. The way actors come together, and the power they will get in the process of creating a new e-newspaper genre, has to be understood as a convergence between different actors and their interests. Here we use a set of concepts related to Actor Network Theory (ANT) to capture the process where structures between different stakeholders who want to form the e-newspaper genre, take form. We will therefore present, first genre theory and then ANT that will function as the two theoretical components to underpin the discussion on the e-newspaper and the associated value network.

**GENRE THEORY**

The term genre comes from Latin (genus) and dates back to classical philosophy, where it was used in the sphere of classification. Today, genre is used to refer to any distinctive category of communication of any type, spoken or written, with or without literary aspirations. Genre has been defined as a distinctive type of communicative action, characterized by socially recognized communicative purpose and common aspects of form (Yates and Orlikowski, 1992; Orlikowski and Yates, 1994). Genres are stable in terms of form
and purpose, but also used, reproduced and changed over time. When changes to established genres become widely shared among members of a community, genre variants or even new genres may emerge. Such changes may be triggered by the introduction of a new communication medium (Yates and Orlikowski, 1992; Yates et al., 1997).

Genres are produced, reproduced and changed over time. When changes to established genres become widely shared among members of a community, genre variants or even new genres may emerge. Such changes may be triggered by the introduction of a new communication medium (Yates and Orlikowski, 1992; Yates et al., 1997).

The combination of computing devices and the Internet has broadened the genre research agenda beyond organizational communication to include digital genres (Shepherd and Watters, 1998; Crowston and Williams, 2000; Shepherd and Watters, 1999; Greer and Mensing, 2004). Examples of this are studies of the evolution of online newspapers (Shepherd and Watters, 1998; Shepherd and Watters, 1999; Greer and Mensing, 2004) as well as other Internet genres (Bauman, 1999).

Shepherd and Watters (1998) coined the term “cybergenre” and have proposed a taxonomy of cybergenre evolution. They have divided the cybergenre into two classes of subgenres; extant and novel. Extant genres are based on existing genres in other media that have been transferred into the digital media. Novel genres are fully dependent on the digital media. Replicated subgenres can be described as following the content and form of the counterpart genre in other media with little new functionality added by the new medium. In variant subgenres the content and form are somewhat different, with substantial new functionality added. An emergent subgenre has evolved from the variant subgenre to the extent that it is only marginally recognizable as the original genre. Significant difference in content and form, and most importantly, a level of functionality that makes it fully dependent on the new media has been added. Spontaneous subgenres are novel cybergenres that do not have any counterpart in other media.

Specific genre characteristics are recognized a priori in the process of communication, thereby reducing the cognitive need for information and interpretation. Several sets of such characteristics have been suggested in the literature. A genre can, for example, be characterized by having similarities in substance and form (Yates and Orlikowski, 1992), where substance refers to themes and topics and form refers to observable features such as a) structural features, b) communication medium and c) language or symbol system. Others have characterized genre by its purpose and form (e.g. Swales, 1990; Orlikowski and Yates, 1994. Although often implicit in the use of genre (e.g. Yates and Orlikowski, 1992) any genre reflects a communicative purpose, a rationale or reason for enacting the communication. Shepherd and Watters (1998) argue that while non-digital genres can be characterized by the tuple <content, form>, digital genres are characterized by the triple <content, form, functionality> as the medium has functional capabilities. Functionality refers to capabilities available through the new media (Shepherd and Watters, 1998).
In this paper we focus on the characteristics content, form and functionality:

- Content refers to the substance (Yates and Orlikowski, 1992), e.g. articles, news streams, video items etc.
- Form refers to observable features (Yates and Orlikowski, 1992), i.e. the presentation format of the content, e.g. as a textbox, a button or an icon.
- Functionality refers to capabilities available through the new media (Shepherd and Watters, 1999) e.g. searching, interactivity etc.
- Purpose refers to a shared communicative purpose (or purposes) that the genre is intended to fulfill (Swales, 1990).

Genre is an important aspect for understanding how forms, rules and functions structure communication and interaction in digital media. However, it is important not to overly emphasize stability of genres. Genres emerge, change and shift. Changes occur and, when being communicated and shared among people, give rise to new sub-genres or completely new genres. It is also important to understand how technical forces (Erickson, 1999) structure such changes. This has become apparent as new Internet based digital genres have evolved and gained importance, both for understanding how communication is socially organized and as a prerequisite for designers that actively want to develop new genres by designing technology use.

The development of a new genre emerges from the practices of the involved actors. However, genre theory does not give any theoretical tool for understanding what powers and forces are involved. Why does a new genre emerge the way it does? How does the relationship between certain aspects of a digital genre, such as form, content and functionality, take shape in relation to each other and surrounding forces? Genres are not created on their own – they are collective phenomena. To capture this more actor and context oriented dimension of genre formation, ANT proves to deliver a useful theoretical component.

**Actor Network Theory**

In this paper the aim is to develop an analysis where genre theory is combined with ANT. We will analyze the development of the e-newspaper as an evolving genre by analyzing how a network of actors is forming around this technical artifact. As argued by Hanseth and Monteiro (1998), Actor Network Theory (ANT) offers IS research a language for describing how technical and non-technical mechanisms can form a network of actors that will negotiate interests and trying to gain influence. Even if Hanseth and Monteiro (1998) mainly use ANT for analyzing infrastructure standards, genre can in some sense be regarded as a standard for communication and interpretation, in this case in the area of e-paper news. Technical standards are a part of and forming, as well as being formed by, the evolving genre.

Actor Network Theory (ANT) recognizes that establishing and changing a social order relies on a tight interplay between social and technical means. The basic concept in ANT is the one
of the actor. An actor may pursue interests, which may be translated into technical or social arrangements, e.g. an information system or organizational routines. Actors are typically humans, groups of humans, texts, visual representations and technical artifacts.

The social process of aligning an initially diverse collection of interests to "one", i.e. reaching a certain degree of alignment of interests, leads to acceptance, "truth" or stability. The solution reached is constituted by an aligned actor-network. To achieve this, one must be able to translate (i.e. represent) the interests of others (not-aligned) to one's own. The translation process is forming the actor-network by generating ordering effects such as devices, agents, institutions or organizations (Law, 1992).

An inscription is the result of translating one's interests into material form, i.e. an ERP-system may be an inscription of management's interest to control, a vendor's interest to form a de facto standard or attempts by branch organizations to create and control standards. There are four aspects of inscriptions relevant to this study:

- What is inscribed;
- Who inscribes them;
- How they are inscribed,
- How powerful are the inscriptions, i.e. how much effort does it take to oppose an inscription (e.g. in the form of workarounds of an information system).

A translation presupposes a medium or material into which it is inscribed, i.e. an intermediary. An intermediary is anything passing between actors which define the relationship between them (Callon, 1986). Examples are scientific articles, computer software, technical artifacts, disciplined human bodies, contracts and money. There are four main types of intermediaries:

- Texts (literary inscriptions), including reports, books, articles, patents and notes. These are materials inscribed and circulated on paper, floppy disks, magnetic tapes etc.
- Technical artifacts, including scientific instruments, machines, robots, and consumer goods. These are relatively stable groups of non-human entities which together perform certain tasks.
- Human beings, including the skills, the knowledge and the know-how that they incorporate.
- Money in all its different forms.

The translation process consists of three stages. Problematization is the first stage. Here the main actor in focus identifies interests among other actors that seem to be consistent with its own interests. The actor tries to establish itself as an obligatory passage point (Callon, 1986) making itself absolutely necessary for the other actors. Interessement is the second stage in translation where the main actor tries to convince other actors to accept its interests. Through enrollement the actor tries to draw the other actors into its scheme of
actions and accepting them as the main course for action and identity. By creating technical (or other) artifacts and inscribe interests in them, the actor tries to ensure that its interests are protected (Latour, 1986). Irreversibility is achieved when it becomes impossible to return to a point where alternative routes exist (Walsham, 1997).

ANT thus gives us tools to capture how a value network is organized as a network of actors that try to dominate the process of creating value in the network. In this empirical case the value is tightly connected to the development of e-newspapers as a genre.

RESEARCH METHODOLOGY

The research was conducted within the DigiNews project (ITEA 03015) described in detail in section 4. Within this project a multiple method approach (Mingers and Gill, 1997) was taken in order get to a richer understanding of the research topic. In the project we used several data collection methods, such as interviews, workshops, questionnaires and tests with different actors such as publishers, advertisers, readers and device producer. In Table 1 we give an overview of these activities besides the seven project meetings with the whole consortium, six telephone meetings with various project members and six meetings with the Swedish steering group.

<table>
<thead>
<tr>
<th>Actors</th>
<th>Data source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Publishers</td>
<td>30 interviews, 16 workshops, 8 focus group sessions</td>
</tr>
<tr>
<td>Readers</td>
<td>5 focus group sessions, 3 workshops, 3 user tests and interviews (19 respondents, 36 respondents and 12 respondents respectively), 5 questionnaires</td>
</tr>
<tr>
<td>Advertisers</td>
<td>3 workshops, 2 interviews</td>
</tr>
<tr>
<td>Device producer</td>
<td>1 interview, project documentation</td>
</tr>
<tr>
<td>Technical solution provider</td>
<td>Project meetings, project documentation</td>
</tr>
</tbody>
</table>

Table 1. Actors vs. data sources

In this paper our aim was to analyze how the negotiations between different actors shape the emergence of the e-newspaper genre. When analyzing all the available interview transcriptions, project documentation, notes, test results etc., we especially looked for the expressed interests of each actor and oppositions between actors, i.e. patterns were identified in the material (Miles and Huberman, 1994). Excerpts in the transcribed material were marked with assigned colors, facilitating data categorization according to
corresponding themes, in our case we categorized according to distribution, newspaper content, device, content management, business models and demonstrator issues.

THE DIGINEWS CASE

In this section we describe the DigiNews case, which later will be discussed and analyzed from a genre and an ANT perspective. The case description is organized in the following way: first background and the initiating actors are described. After that, distribution will be used as a way to describe how infrastructures played an important role when forming the network. Thereafter the description will focus more on how these conditions came to form the emerging genre in terms of content and device. The sections about content management, business models and prototypes draw us back to the importance of understanding actors and network alliances.

PROJECT INITIATIVE AND ORGANIZATION

The initiative to the DigiNews project was taken by the device producer Philips and the Swedish Newspaper Publishers’ Association. The basic interest from Philips side was to find suitable content for the e-paper device and the newspaper industry was looking for new digital publishing channels. Thus, they had a common interest in investigating e-paper as a new technology for publishing newspaper content. An initial group of partners were invited to join in an application for an ITEA project. Newspaper publisher organizations were invited as well as technology solution providers and researchers. The technology solution providers were invited to the project depending on the needs identified in the project, and the researcher depending on competence areas. The interests from the different participants were negotiated in the planning process, e.g. small technology solution providers built in ideas such as text to speech, payment and security solutions etc., that were consistent with their line of business.

The project application was successfully approved and all participants then applied for funding in their country. There were some partners that failed to get funding and thereby left the project consortium. The advent of a technology solution provider leaving the project resulted in that functions that were important parts of the solution were excluded or down prioritized. One such example is the text to speech solution, when the company evoking that solution left the consortium the text to speech solution was excluded in the project.

DISTRIBUTION

One of the most critical issues in the e-newspaper solution was distribution. It became clear that different solutions might be interesting for different geographical areas, different types of content, different types of target groups, different types of devices etc. In other words, distribution would be overlapping several infrastructures such as IP, DAB, 3G, WiFi etc., depending on where, what, when, and to whom. In addition to distribution capacity, the distribution issues also have impact on publishing systems and formats, thus also on the
newspaper content design. These issues were therefore very important to the publishers and received special attention from researchers. The distribution issues were widely discussed and the relation to business models was stressed in these discussions. The publishers experience from for example charging for content on the internet and the revenue shares in telecom made the publishers stress the importance of a solution where they would be in control of distribution. However, the device producer was worried that an integrated solution for distribution would require new standards which they from experience in other areas regarded as a major challenge.

**Newspaper Content**

Naturally, the publishers were the most engaged in the design of the e-newspaper content. Their interest in e-paper technology and the properties close to print on paper raises hopes of finding a digital replacement for paper in the long run. The purpose of the e-newspaper from their perspective would be to offer a reading experience as close to the printed newspaper as possible, making use of the possibilities offered by digital media. Newspaper designers from several newspapers in Sweden and Belgium were engaged in designing prototypes with this vision in mind. These designers’ views were that the e-newspaper would benefit from taking the best from two worlds i.e. the printed newspaper and the online newspaper, thus making use of the benefits of the e-paper having properties close to print on paper and the benefits from e-paper being a digital technology. In order to ensure reader´s views on the values from print and online newspaper and to bring the best from both worlds in the design of the e-newspaper, numerous workshops were held with readers and newspaper staff. The outcome of these activities was input to a design focus group of newspaper designers who designed prototypes with different design solutions.

There were several challenges to address in the design. The most pressing was the limited screen size. Due to the limited screen size of an A5 there was a challenge in shrinking the print newspaper layout. One of the newspaper organizations performed a test to transfer all content from one day’s edition of the printed newspaper to a template in the publishing system constructed according to the specifications of the e-reader devices screen size and lay-out possibilities. Some content was excluded due to the format not fitting, e.g. the TV schedule and obituaries. The test showed that the content and form of an e-newspaper have to be distinctive for this type of media. Taking almost all content into a page layout in an A5 format resulted in about 400 pages. As a result, navigational issues were paid special attention when giving form to the e-newspaper. The different design suggestions were tested with readers by researchers at different stages of the project.

Another important challenge discussed mainly from the publisher point of view was designing new advertising formats to attract advertisers to the e-newspaper still appreciated by readers. The device producer had another idea of the purpose of an e-newspaper. The publishers would according to their model publish single articles in a huge content management system from which customers could buy single articles they found interesting. One technology solution provider provided an interface where users could...
access the e-newspaper content. This solution was more or less ignored by the publishers since it was not in line with their ideas of the e-newspaper concept.

**THE DEVICE**

The reading device with e-paper technology that was intended to be used in demonstrating the solution was developed in parallel with the project by the device producer. The capabilities of the device obviously had influence on the design of the e-newspaper. The requirements on the device were to a large extent based on the publishers' interest but there were also technology solution providers that argued for implementing their solutions in the device. The Swedish publishers tried to convince the device producer that color is extremely important for a successful e-newspaper. This view was tested and confirmed with readers and advertisers in Sweden. Color was especially stressed as important by advertisers. However, color was not regarded as important by the publishers from other countries.

Another example of requirements from publishers on the device was the need for handling columns in forming the content, with the argument that readers expect this form for news content. Yet another example which has been paid a lot of attention in the project was content navigation structure. Supporting hyperlinked navigation as well as sequential, supporting the readers reading behavior such as relaxed as well as task oriented are examples of these requirements.

During the project, the consortium was regularly informed about the development of the e-paper technology and later also about the e-reader device. The display size was about A5, some publisher tried to argue that A4 was the limit for how much a newspaper can shrink. This also put constraints on navigation support balancing content and menus etc. This small size was according to the device producer related to technical limitations. There was no support for columns even though publishers wished for that, this was an interest that the device producer did not find to be relevant enough to prioritize in the development. A third example is that there was no support for color which had not been solved in the laboratories which led to some of the publisher losing interest in taking part in the testing and demonstration phase of the project.

During the end of the project the development and manufacturing of the device left Philips and continued in iRex, a start-up company that originated from Philips (both companies are referred to as device producer).

**CONTENT MANAGEMENT**

Another critical part of the e-newspaper solution was the content management system including digital rights management and security issues. The technology solution providers took a background position in the negotiation about these solutions since their interests were related to more detailed parts. This issue played out to be tensed between the device producer and the publishing organizations. The device producer took the lead presenting a solution with a central database fully controlled by the device producer itself, all from
including security, payment and DRM solutions, to aggregating and distributing content. In this solution, the device producer would be the hub of the entire system even controlling advertisers and reader relations. In their sketch, the publisher role would be to provide content such as articles that could be sold to readers via this hub. This means that all stakeholders, whether content providers, advertisers or readers, would obligatory have to pass through this hub.

The publishing organizations reacted strongly to this suggestion and there were intense negotiations concerning this issue. For some time, this discussion paralyzed the project. The publishers could not accept such a solution as it would violate their core business model of selling news to readers and exposure to advertisers. Further they stated that the fundament for the newspaper, their brand and trustworthiness would be invisible in such a solution. These interests were not fully aligned in the project but a compromise was agreed upon in order to be able to finalize the project and demonstrate and test the e-newspaper solution. In the testing, the device producer’s database was used to distribute the content and the publisher took the content provider and aggregator roles.

**BUSINESS MODELS**

As described earlier the publishers and the device producer had a common interest in initiating the project. The publishers tried to bring their traditional business model into the project and stressed the importance of forming the e-newspaper to leverage reader as well as advertiser values. The researchers took a role in investigating the business aspect mainly from the publishers viewpoint. This resulted in several studies on user and advertiser’s value perceptions and preferences. The device producer had an agenda of launching a new device for a mass market. The interest from the device providers takes its start in the properties of the display technology. As e-paper technology is heavily directed towards text and reading there was a need to secure relevant content for an e-paper device before launching. Therefore, they regarded newspaper content as very interesting since it is widely ingrained in people’s habits. In other words, they were interested in the wide audience of newspaper readers as a market for their reading device.

During the project it became clear that the competition between the different roles would change with an e-newspaper solution. Integrated infrastructures would have impact on the value networks that are very isolated within each infrastructure today. The competition within the newspaper publishing industry would change, the limitations of print distribution would no longer be as essential for competition. These insights resulted in more reluctant attitude to discuss business models openly in the project.

**DEMONSTRATOR**

At the end of the project a demonstrator based on the device, an IP distribution and newspaper content from several newspapers was produced. Due to the limitations of the device all intended functionality could not be demonstrated. The demonstrator of the production, distribution, and consumption of the e-newspaper was set up at one of the Swedish newspapers, Sundsvalls Tidning. A publishing system was designed by consultants
to be able to feed the device with newspaper content. Ten families were selected as test consumers and the e-newspaper was distributed through the internet. The families had the e-newspaper delivered twice a day during a two week period.

**DISCUSSION**

In this section we will analyze the DigiNews project in relation to the theoretical standpoints from ANT to understand the process of forming the value network and genre theory to understand the subjects of negotiations. According to ANT actors pursue interests which they try to translate into technical and social arrangements and thereby trying to make their interests legitimate and also align different interests into an actor-network. The very formation of the DigiNews project could in ANT terms be seen a phase of problematization, where the main actor identify common interests among the other actors that are consistent with its own. In the following we will identify the different actors that can be found in the DigiNews case and their different interests. The role as main actor is varying in the course of the project. We will then analyze the translation process in terms of the genre characteristics form, functionality and content.

**ACTORS AND THEIR INTERESTS**

In Table 2, we identify the actors and their main interests in the DigiNews project.

<table>
<thead>
<tr>
<th>Actor</th>
<th>Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Primary actors</strong></td>
<td></td>
</tr>
<tr>
<td>Device producer</td>
<td>To have content to the device in order to gain market acceptance</td>
</tr>
<tr>
<td>Publisher organization</td>
<td>To guard the e-paper potential for the news industry</td>
</tr>
<tr>
<td>Publishers</td>
<td>Get a new profitable digital channel for news and mobile services</td>
</tr>
<tr>
<td><strong>Other actors</strong></td>
<td></td>
</tr>
<tr>
<td>Small technology solution providers</td>
<td>To make sure that their technical solution was incorporated in the solution</td>
</tr>
<tr>
<td><strong>Represented by other actor</strong></td>
<td></td>
</tr>
<tr>
<td>Readers</td>
<td>To get high quality services in a device that is easy to interact with</td>
</tr>
<tr>
<td>Advertisers</td>
<td>To find new advertising models based on targeting</td>
</tr>
<tr>
<td>Infrastructure providers</td>
<td>To provide the infrastructure and be a part of the value chain</td>
</tr>
</tbody>
</table>

*Table 2. Actors vs. interests*

The initial primary actor was the *device producer*. Second to the device producer the *publishers* tried to take on the leading role together with the Swedish Newspaper
Publishers’ Association (Publisher organization). The publisher organization represented the Swedish publishers in the project meetings. Thus, they represented the publishers’ interests, but had also an interest in developing the publisher industry. Several small technology solution providers tried to get attention and become a part of the actor network. Often they took on a more passive role at the project meetings but took a more active role in the work packages where their technology was represented. The readers were only represented in the project by the studies performed by the Swedish researchers. The readers have an interest in the device and services as consumers, and are thus important for all other actors to relate to. Advertisers had an interest to target readers. They were not actors in the project, but the Swedish researchers represented their interests. On the infrastructural level the infrastructure providers were important but were not invited to take an active role in the project. The Swedish researchers provided an overview of possible solutions depending on different infrastructures. As ANT theory reminds us, making other actors take on ones interests is an important asset in an actor network.

THE BATTLE OVER FUNCTIONALITY

The device producer had for natural reasons strong interests in defining the functionality of the e-paper device. But their interest was not limited to the device itself. They also had an interest to make their own technical platform a de facto standard for publishing content, thus establish themselves as an obligatory passage point. This included a strategy to develop a proprietary system for content management. The device producer did not want to put a device on the market without existing content and content providers. The device producer inscribed this interest into a suggestion for an all-encompassing database.

However, this interest could not be aligned with the publisher interest. The publishers did not accept a solution where they would lose control over distribution, reader and advertiser relations. Further they stated that the fundament for the newspaper, their brand and trustworthiness would be invisible in such a solution. The publishers’ main interest was to make their business model default for selling news and attract advertising. Therefore, they had an interest in aligning the device producer in the interest to sustain their traditional business model. However, as stated above this was not an option for the device producer. This created a tension in the project.

The conflicting interests of the device producer and the publishers lead to a struggle of becoming obligatory passage points in different ways. The device producer’s inscription of interests in the device and publishing platform was in conflict with the intermediary prototypes and publishing system inscribing the publisher interests. The publishers enrolled the readers and advertisers through the researchers and used their interests as arguments to align the other actors. The readers also wanted to have features from both the printed and online newspaper genre, e.g. navigation (both sequential and hyper links) and interaction. The advertisers were interested in increased targeting possibilities. These interests were used as arguments from the publishers and researchers to influence the functionality of the device, although not very successful.
The small technology solution actively tried to inscribe their interests by struggling to implement their own technical ideas in the solution, thereby making themselves necessary for the other actors. Their main interest was to make other actors acclaim the need for their sub-solutions. One example was the text-speech functionality. As soon as that provider withdraw the other actors lost interest in that function.

When the development of the device was moved to iRex, Philips no longer had an interest in being an active part of that network, even though they still were the official project leaders of the DigiNews project. The interest from other actors in the network towards Philips also diminished. That did not mean that the importance of the device producer as an actor in the network decreased. The researchers argued for the device to support several different standards for distribution, infrastructure and security technologies.

**THE STRUGGLE FOR FORM**

Swedish publishers and researchers argued that the device producer must develop more support for expressing aesthetic features, such as color and traditional newspaper layout with columns with integrated photos etc., in line with the printed and online newspaper genres. Negotiations about color revealed conflicting views of its importance, which can be analyzed as a struggle to define genre specific form properties.

The device producer argued for a totally different solution based on their business model idea that builds on single articles and advertisements handled by their own system. In this case the traditional newspaper layout was seen as of no interest.

Philips enrolled one of the small technology solution providers and let this firm develop an interface corresponding to their interests. This interface was in conflict with the intermediary prototypes developed by the design focus group of Swedish publishers.

In collaboration with readers specific form items for the e-newspaper genre was developed by the design group. Examples of such form items were miniature pages, content overviews, thumb navigation etc.

**THE QUEST FOR CONTENT**

Both the publishers and the device producer had an interest in content. The device producer wanted to launch a new device for the mass market. The interest from the device producer takes its start in the properties of the display technology.

They needed to establish that there is relevant content for an e-paper device before launching a product. A device without content is not interesting to the market. Therefore, they regarded newspaper content as very interesting since it is widely ingrained in people’s habits. In other words, they were interested in the wide audience of newspaper readers as a market for their reading device.
The device producer’s actions to inscribe their interests in the solution had the consequence of challenging the content provider role in the value network. Since their business model builds on the publishers selling single articles and that they would “take care” of the advertiser business themselves, it is in total conflict with the publishers’ core business. The publishers’ most important asset is their content and their trustworthy brand which they are not willing to trade in the way the device producer was proposing. The readers showed an interest in new content specific for the e-newspaper genre. Examples of such content were position and personalized based services.

**The Pursuit of Purpose**

As demonstrated in the case description there was several conflicting views of the purpose of the e-newspaper. The device producer view of the e-newspaper purpose was to secure that there would be interesting content for consumers to take an interest in the device. However, they did not regard the device to be exclusive for the e-newspaper. They regarded the newspaper articles to be one type of content along with other such as books, magazines etc., to be available for consumers through their system.

The Swedish newspaper publishers’ interest for the e-newspaper was that it could be accepted by print newspaper readers. In their interest, the initial purpose was to be able to distribute a substitute for the printed newspapers in areas where subscribers are very distant, thus cutting distribution costs in sparsely populated areas. In the long run they regard the e-newspaper as a possible replacement of the printed newspaper. The publisher organization and the other European publishers emphasized the purpose to attract young and new audiences.

Readers regarded the e-newspaper purpose to be a complementing mobile service and maybe a possible replacement for the printed newspaper in the long run. For the advertisers the purpose of the e-newspaper was increasing their targeting of readers.

**Towards Alignment**

The characteristics of the e-newspaper genre in terms of form, functionality, content and purpose are of course deeply interrelated. Publishers, naturally have a strong interest in the functionality of the new technology for distribution and consumption of newspapers (and of course in form and content). But we could also see that main actors, such as the device producer, have strong interests in traditional publisher issues, e.g. content and business models.

When this study was ended, the process was still running. New actors (e.g. Amazon) and new devices (Sony Reader, Bookeen Cybook, STAReBOOK) are still entering the network, and the translation processes keeps going. This means that the network is not aligned, the market structure is still under formation and the genre as well as what will become a value in the network, is still in the making.
In this paper we have described the negotiations between different actors in the formation of the e-newspaper genre. We have established that there has not yet been an alignment of the actors in a value network. We believe that a possible cause for this might be that the primary actors, i.e. the device producer and the publishers were too focused on guarding their own interests and not willing to aligning around someone else interests. Looking at the present it is interesting to notice that Amazon has taken the primary role on the American market, i.e. not a device producer or a publisher.

Another reason might be that the different actors’ interests were not valued according to a business point of view. In that case it would be expected to view the consumers (readers) as a primary actor. The device producer chooses not to listen to the readers. By ignoring the important interests of the ones that are going to buy and use the device and services, lead to the publishers not believing in publishing in the device.

There are currently newspapers publishing in the iRex device, both are financial newspaper not depending on newspaper layout as much as daily newspapers. Le Monde is currently publishing in the Amazon Kindle, also without a proper newspaper layout. None of the Swedish newspapers are currently publishing in any e-paper device. They are still awaiting the support for form, functionality and content which are in line with their interests in the e-newspaper.

**CONCLUSION**

In this paper we have shown how the interests of different actors converged through negotiations in the formation of a value network around a mobile innovation, the e-newspaper. By combining ANT and genre theory we analyzed the complexity in the process of aligning value networks around a new mobile innovation. ANT proved to be a useful tool in analyzing the process of forming the value network, while genre theory was useful to address the characteristics of innovations in the specific business area of newspapers. With the ANT approach it became obvious how both primary actors were trying to take control of the value network. Sometimes this was done by attempting to control organizational issues and business models. Sometimes the technical artifacts were used to promote interests. Even though the companies took the initiative forming the DigiNews project based on a common interest they were not able to align their interests into a functioning value network. The project resulted in two parallel solutions of the e-newspaper each inscribing one of the primary actor’s interests.

By conducting this analysis we have shown how Actor Network Theory (ANT) can be used in combination with other theories - in this case genre theory - to analyze emergent value networks. ANT captures the actors negotiating interests when forming the value network. Genre theory captures the domain specific characteristics of the innovation, in this case the e-newspaper, and how this structures negotiations between different stakeholders.
The conclusion for practice is, when aligning a value network around new mobile innovations it is recommended to not take a “guardian” approach protecting traditional values, but a more open and sensitive approach to the other actors in the network. Of special importance are the end-consumers.

REFERENCES

PAPER 1


ABSTRACT
As most of today’s media houses publish in multiple channels, they also exist in a multitude of infrastructures. Given the ongoing diffusion of personal computers, handheld devices, and mobile telephones as well as the advent of new technologies such as the e-paper, a new type of ubiquitous media environment is emerging. Drawing on this background we address the research question what are the challenges when aligning a new promising technology (such as the e-paper) with existing value networks enabling value creation in ubiquitous media environments? In this paper we report from a study with newspaper publishers in Sweden, Belgium, France and the Netherlands consisting of 18 interviews and 9 workshops. The findings show that value networks in a multiple channel publishing environment are closely related to infrastructure environment. The nature of ubiquitous media environment will have implications on value networks openness and flexibility. Value networks will need a fluid structure to cope with changes in very short cycles.

INTRODUCTION

News publishing organizations of today are often organized as media houses publishing in multiple channels, distributed in a multitude of infrastructural environments, such as print, online, telecom and broadcast. Given the frequent introduction of new devices and improved wireless communication technologies as well as the advent of new technologies such as the e-paper, new business opportunities emerge for these organizations. This development enables reaching a mass-scale audience anytime, anywhere through a multitude of devices resulting in a ubiquitous information environment (Lyytinen and Yoo, 2002). A ubiquitous information environment is a heterogeneous assemblage of interconnected infrastructure and service solutions to support mobility, mass scale and digital convergence (Lyytinen and Yoo, 2002). We use the term ubiquitous media environments (UME) to discuss the integrated infrastructures and services applicable to the news publishing industry.

Future UME differs from multi-channel publishing in that services would be channel-independent. Services would be accessible anytime, anywhere in the most convenient way depending on users needs as well as physical and social situation (Aboyd and Mynatt, 2000; Yoo and Lyytinen, 2005). This requires that services can migrate seamlessly between devices and that the environment encompass the intelligence required to make the necessary context adaptations following users’ movements (Henfridsson and Lindgren, 2005; Yoo and Lyytinen, 2005). As recognized by Jonsson et al. (2008), these digital advancements lead to transformation of existing value networks, or even to disruption of value networks and business models (Christensen, 1997; Vanhaverbeke and Cloodt, 2006).

This disruptive effect of digitization has been experienced in the news publishing industry (Christensen and Davis, 2006). Since the introduction of the internet in the mid 80’s circulation of print newspapers has declined in Australia, New Zealand, North and Latin America, and Western Europe and the advertisers are following the readers to digital media (The Economist, 2006). It is against this background that news publishing organizations have expanded their business to publishing in multiple channels. However, this development has been troublesome. For example, establishing business models and value network enabling profitable business online has been a struggle. This situation is now experienced in publishing mobile services. There is still a lot of uncertainty related to value networks and business models in digital environments for media houses (Picard, 2003; Ziv, 2005).

Thus, the development towards UME challenges how media houses organize their business and technological environments in value networks. In this paper we analyze how these considerations are treated by management in media houses preparing for a new innovation, the e-newspaper published on e-paper technology. E-paper is reflecting, giving the same reader experience as paper (such as high contrast and the possibility to read in sunlight) and is thin, flexible and non-sensitive. These properties give hope that the e-newspaper can replace the printed edition in time. Given that the e-newspaper combines the readability and overview from the printed newspaper with the possibilities of digital media such as constant
updates, interactivity and video and offer. In UME, it will also be possible to offer personalization, context awareness and location based services.

However, the challenge of realizing these inherent values of UME and an e-newspaper lies in the ability to change strategies rather than technology (Christenson and Rosenbloom, 1995). When the realization of inherent value requires new or radically changed value networks, the innovation is complex even if the technology is not. The innovative character of UME, composed by an assemblage of heterogeneous integrated technologies (Lyytinen and Yoo, 2002) together with the disruptive nature of digital media to newspaper organizations (Christensen and Davis, 2006) indeed makes it interesting to study the complexity of forming value networks in this domain.

In this paper we address the research question; what are the challenges when aligning a new promising technology (such as the e-paper) with existing value networks enabling value creation in UME? We do so by discussing the considerations that arise with the introduction of a new channel in UME. The aim is to contribute to the understanding of value networks in UME by further exploring new issues and putting the different issues from the literature into a more detailed perspective. Moreover, the ambition is to contribute to management with insights of how to align and organize business and technological environments in UME.

The paper proceeds as follows. In section 2 we describe the selected research method followed by an update on eReader devices in section 3. The theoretical background is presented in section 4. Section 5 presents the empirical results and in section 6 these are related to literature. The findings are discussed in section 7 and section 8 concludes the paper.

Method

This research took place within the DigiNews project (ITEA 03015), a two-year collaborative research project, including several major technology firms, media houses and universities across Europe, which ended mid-year 2006. The partners were from Belgium, Spain, Netherlands, France and Sweden. The project was initiated by Philips Applied Technology in Belgium together with the Swedish Newspaper Publishers’ Association. The Swedish newspaper partners were Aftonbladet (AB), Göteborgs-Posten (GP), Nerikes Allehanda (NA), Norrköpings Tidningar (NT), Sundsvalls Tidning (ST), Sydsvenskan (SS), Östgöta Correspondenten (ÖC). European partners from the media sector were Concentra Media (CM), De Telegraaf (DT) and Le Monde (LM). The overall goal of the project was to explore research and development issues for an electronic newspaper of the future. The project aimed at combining the accessibility, simplicity and mobility of printed newspapers, with the advantages of digital media, communication technologies and portable consumer electronics.
Two different types of data collection methods have been used, i.e. interviews with 18 newspaper managers and designers, and 9 workshops with newspaper representatives from management, IT, marketing and design (Table 1).

<table>
<thead>
<tr>
<th>Interviews</th>
<th>Workshops</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS1 (Sep 16th 2004) Marketing manager</td>
<td>STw1 (Oct 6th 2004) – 5 participants</td>
</tr>
<tr>
<td>SS2 (Sep 16th 2004) Layout director</td>
<td>ABw1 (Oct 20th 2004) – 3 participants</td>
</tr>
<tr>
<td>ST2 (Oct 7th 2004) Editor</td>
<td>STw3 (Nov 24th 2004) – Design focus group</td>
</tr>
<tr>
<td>AB1 (Oct 20th 2004) Editor-in-chief new media</td>
<td>DTw1 (Nov 22nd 2005) – 10 participants</td>
</tr>
<tr>
<td>AB2 (Oct 20th 2004) Layout director</td>
<td>LMw1 (Feb 3rd 2006) – 3 participants</td>
</tr>
<tr>
<td>GP1 (Oct 27th 2004) Development director</td>
<td></td>
</tr>
<tr>
<td>GP2 (Oct 27th 2004) Managing Development Editor</td>
<td></td>
</tr>
<tr>
<td>ST4 (Nov 24th 2004) CEO</td>
<td></td>
</tr>
<tr>
<td>CM (Mar 23rd 2005) Head of research</td>
<td></td>
</tr>
<tr>
<td>NT2 (Apr 27th 2005) Head of Editorial Department</td>
<td></td>
</tr>
<tr>
<td>DT1 (Nov 22nd 2005) Director of new media</td>
<td></td>
</tr>
<tr>
<td>DT2 (Nov 22nd 2005) Development officer</td>
<td></td>
</tr>
<tr>
<td>DT3 (Nov 22nd 2005) Editor</td>
<td></td>
</tr>
<tr>
<td>LM (Feb 3rd 2006) Chief Operations Officer and Managing Director</td>
<td></td>
</tr>
</tbody>
</table>

Table 1. Data collection activities

The interview study included a total of 18 respondents. Each of the semi-structured interviews was about 60-90 minutes in length. The semi-structured interview guide used at all sites facilitated the consistency of data collected between sites and interviewees. While allowing individual perspectives and experiences to emerge, the interview guide provided a systematic way of delimiting issues discussed in the interview (Patton, 2002). It covered a variety of topics such as organization, technology, business models, new services and design. All respondents had key functions within each newspaper, e.g. editor-in-chiefs, managers, or designers (see Table 1). At each interview at least two members of the research team was present, one leading the interview and one taking notes and making sure no key issues were missed. All interviews were recorded and later transcribed.

The newspaper staff at the four first workshops and the three last was selected to represent managers, designers, marketing and IT people. In the beginning of the project we formed a design focus group consisting of representatives from Aftonbladet, Göteborgs-Posten, Norrköpings Tidningar and Sundsvalls Tidning that were specifically interested in design issues of the future e-newspaper. Two of these full day workshops concerned strategic issues as well and are therefore included in this paper (see Table 1). The results from the
workshops are mainly illustrated in the empirical part concerning the pros and cons of today’s media channels. All workshops were recorded, and notes were taken by one member of the research team. Relevant parts of the workshops were later transcribed.

In order to categorize the data collected, patterns were identified in the transcribed material (Miles and Huberman, 1994). Excerpts in the transcribed material were marked with assigned colors, facilitating data categorization according to corresponding themes. Within these themes, we scanned the data material for similarities and differences, providing input for re-examining the initial themes.

**E-Reader Update**

In this paper we use the term eReader for digital reading devices using electronic paper technology. Electronic paper (e-paper) is the common term for several different technologies that can be used to produce screens with a number of specific characteristics. The e-paper is reflecting, giving the same reader experience as paper (such as high contrast, good color representation and the possibility to read in sunlight). The resolution is around 160 dpi which is the same as printed newspapers. The e-paper is thin, flexible and non-sensitive. In addition, it does not require high battery performance, ultimately, the screen image is stable and fix even when there is no electrical voltage applied. The three different technologies for e-paper, electrophoreses, dipolar rotation and electrowetting have earlier been described by Ihlström et al. (2005). In this paper we present examples of products that at present on the market and that are expected to be launched during 2008.

Sony introduced the first eReader called Sony LIBRIé on the Japanese market 2004[1]. In 2006 they launched their next generation eReader on the U.S. market, i.e. the Sony Reader (Figure 1). It has a 6-inch screen, weight is less than 9 ounces and one can do 7,500 page views for each charge by an AC adapter. It can hold up to 80 eBooks at the same time, and allows PDFs, personal documents, newsfeeds, blogs and JPEGs [2].

iRex Technologies BV, a spin-off from Royal Philips Electronics, introduced the iLiad (Figure 2) in 2006. The iLiad includes an 8.1 inch screen with 16 levels of grey and 160 dpi resolution, Wi-Fi, USB ports and MP3 capabilities [3]. Using a special marker, readers can comment on articles and scribble their notes on the screen. The French financial newspaper Les Echos, the Chinese newspaper Yantai Daily and the Dutch NRC Handelsblad are currently publishing on the iLiad [4].
Bookeen Cybook is another product on the market (Figure 3). It has a 6" E Ink display with 4 grayscale and a resolution of 166 dpi. It can be used in both portrait and landscape mode [5].

Another product on the market is STAReBOOK (Figure 4) with a 6" E Ink display with 4 grayscale [6]. The French financial newspaper Les Echos also publish in the STAReBOOK device.

Amazon has recently introduced the Kindle (Figure 5) a branded eReader to which over 100 000 books, U.S. and international newspapers, for example The New York Times, The Wall Street Journal and Le Monde, as well as numerous blogs can be purchased through their own wireless delivery system, Amazon Whispernet [7].

Plastic Logic is building the first commercial manufacturing facility targeted at flexible active-matrix display modules (Figure 6) and will start the production during 2008. They estimate an initial production of one million units per year [8].
Polymer Vision announced in January 2008 the Readius® product for commercial launch by mid 2008 [9]. It is a hand held mobile phone device with a five-inch monochrome rollable screen with 16-levels of grey.

Bridgestone is working on a color e-paper. In October 2007, they announced a 0.29-millimeters thick e-paper that is capable of displaying 4,096 colors on an eight-inch display [10].

As this overview shows there are several eReader devices with newspaper content. There are also new devices announced to be launched on the market with new features such as bendable and color displays.

**SERVICE DISTRIBUTION IN UBIQUITOUS MEDIA ENVIRONMENTS**

The literature review is informed from two theoretical traditions. First, we give an overview of concepts of ubiquitous computing as it is manifested in information systems research and, second, of theories of value networks from business administration.
SERVICE DISTRIBUTION IN UME

The emergence of UME indeed renders new challenges for news publishing organizations. Offering ubiquitous media services requires distribution of services whenever and wherever users need them, and also for services to be accessible through multiple devices at different locations. As a result, distributing services in UME, dynamically supporting users anytime anywhere, is very challenging.

The multi-contextual nature of ubiquitous information environments requires seamless support for individual’s context switches, to be a well working computing environment (Henfridsson and Lindgren, 2005). This requirement means that the ubiquitous environment must be capable of handling the dynamics of users’ social contexts, i.e. capable of context awareness. Context-awareness is typically related to physical location and user identity, but can also include knowledge about time, history, social context, other people, work or private etc (Aboyd and Mynatt, 2000). In addition, to meet the personal needs of mobile users, ubiquitous services will require personalization, support for dynamic mobility, and support associated channel adaptations (Lyytinen and Yoo, 2002).

Moreover, the distribution of services needs to be adapted to the dynamics of users’ environments in terms of changing technological capabilities in the environment, and to changing hardware capabilities (Banavar and Bernstein, 2002). Services may be accessed through multiple devices by the same user, and seamlessly migrate to another during service delivery (Lyytinen and Yoo, 2002; Henfridsson and Lindgren, 2005). As a result, use patterns can be described as fluid (Henfridsson and Lindgren, 2005) and consequently services cannot be designed on assumptions of devices or infrastructure capabilities.

The infrastructure resources of UME must accordingly enable distribution in diverse ways, and in large scale. A global information infrastructure will be geographically spread and institutionally disperse delivering telecommunication solutions, wired and wireless communication solutions (Lyytinen and Yoo, 2002). Not only need an infrastructure in UME support geographically distributed and mass scale distribution of services but must also support a wide variety of digital data such as text, numbers, audio, video and images (March et al., 2000). The diversity of different digital data formats creates challenges for effective handling as there are no conceptual basis for representing the underlying semantics of for example a video (March et al., 2000).

The rapid advances in technology continuously changes how services can be produced, distributed and consumed. The infrastructure needs to be scalable for millions of users with a large number of devices. Further, the technical and software solutions must be generalizable across multiple application domains to be profitable for solution providers. All of these issues also have an impact on performance that will have to be on an acceptable level for consumers (March et al., 2000). Accordingly, IT infrastructure concerns global reach and range, scalability, flexibility, and openness to emerging technologies (Sambamurthy and Zmud, 2000). For a service provider, global infrastructures include a wide network of external actors and potential partners with steady or loose arrangements, even on a need basis.
Not only do the challenges of distributing services in UME cause changes in media houses so does the ongoing convergence across the computing, communications, and content industry (Sambamurthy and Zmud, 2000). This convergence redefines the roles and relationships within and between the industry firms and has resulted in a development of new IT architectures. In turn, this has influenced how IT activities and relationships are organized. Driven by IT development, firms are developing market responsiveness and flexible ways of creating customer value. Digital convergence, globalization and the competition constantly challenges the IT organization. Therefore, new strategic networks and alliances are being built with key technology partners (Sambamurthy and Zmud, 2000).

As a result, the emergence of UMEs has impact beyond a single organization. The rapid development of technology supporting social and physical mobility accelerate the span and the complexity of interorganizational coordination. In addition to the governance and control of infrastructure issues within an organization, a key challenge is the control and ownership across various media in multiple contexts (Lyytinen and Yoo, 2002). Thus, there is a need to integrate these issues in decisions and strategies as the rapid convergence media, service and product companies, causes profound changes in the organizational and industry structures and the associated value networks (Lyytinen and Yoo, 2002). How to manage infrastructure and strategy decisions in this very complex environment, having impact on external and internal organizational relations as well as on business and value chains and networks is a major challenge for IS researchers (Sambamurthy and Zmud, 2000).

To address the challenge of organizing business and technological environments in digital economy Sambamurthy and Zmud (2000) suggest a platform (see Figure 9). The platform consists of the components capabilities, relational structures, and integration structures.

**Figure 9.** Overview of the platform logic (cf. Sambamurthy and Zmud, 2000)

*IT Capabilities* refer to IT-based assets and routines that are the most important and vital for value creation and successful business. *Relational structures* are the internal and external relationships and networks that enable the IT capabilities. Finally, *integration structures* refer to the integration between IT capabilities and relational architectures. This includes coordination of IT and business capabilities to create value as well as to give identity to the role of IT capabilities in the value creating internal and external networks. Indeed, value creating processes and value networks are central components of organizing business and technological environments in digital economy.
VALUECREATION AND VALUE NETWORKS

The inherent value of a new innovative technology is realized through a value creating process (Chesbrough and Rosenbloom, 2002; Yoo and Lytinen, 2005). In business management, value creation refers to the activities a firm performs to create a value proposal. Porter’s (1985) value chain framework analyzes value creation as a chain of activities at firm level that all contribute to the value of a product or service offered to a market. The main managerial objective of this analysis is to maximize value at a minimum cost. This approach is challenged in the digital economy (Allee, 2000).

The digital economy is dynamic and characterized by rapid development and high competitiveness (Amit and Zott, 2001). Already in 1993 Normann and Ramirez argued to shift from a single firms value chain thinking to value network thinking where all stakeholder co-produce value. Value creation can also be co-created with and between customers (Stabell and Fjellstad, 1998). Value network is a more fluid structure than the value chain construct and therefore regarded to fit better to the complex dynamics of value creation in the fast moving e-commerce (Allee, 2000). Value networks can be understood as the network of relationships to a firm’s stakeholders and the internal organizational structure of a firm, i.e. “the context within which a firm identifies and responds to customers’ needs, solves problems, procures input, reacts to competitors, and strives for profit” (p 36, Christensen, 1997).

As demonstrated by Vanhaverbeke and Cloodt (2006) interorganizational networks need to be set up and managed to commercialize innovation successfully. These networks are important to jointly create value to targeted customer groups. Value networks are linked through business models unfolding the potential value of an innovative technology (Chesborough, 2003; West et al., 2006). Orchestrated by firms architecting business models network members are aligned to realize that value (Chesborough, 2003). A business model encompasses articulating customer value, identifying customer segments and the structures for value creation including financial structures, competitive strategy as well as participants in value networks (Chesborough, 2003).

All participants should profit in a value constellation. The strength of a value network is determined by the added value compared to alternative networks, and by the commitment from the participants (Vanhaverbeke and Cloodt, 2006). A value network creates value through complex and dynamic exchanges of three types of value currencies; goods, services, and revenue; knowledge; and intangible benefits (Allee, 2000). According to Allee (2000), knowledge and intangible values are of equal importance as revenue exchanges, not the least in the information and knowledge economy.

Value networks and value creation has been addressed in ubiquitous computing research. Lyytinen and Yoo (2002) highlight the transforming effects of ubiquitous information environments on a business level as an important path for research. Responding to this call, Jonsson et al. (2008) conducted an explorative study of how ubiquitous computing can influence business. This study showed that value creation process in ubiquitous computing environments should be designed cross organizational boundaries.
Adding to this line of research we aim to contribute to the understanding of value networks in ubiquitous information environments by further exploring challenging issues. In this paper we address the research question what are the challenges when aligning a new promising technology (such as the e-paper) with existing value networks for enabling value creation in UME? We do so by analyzing the newspaper organizations considerations concerning the introduction of a new channel, the e-newspaper. The data presentation will highlight newspaper organizations considerations regarding the capabilities in UME, existing channels with their advantages and disadvantages, the opportunities and barriers with including with the e-newspaper, and finally the challenges of aligning the e-newspaper with existing value networks. The data presentation will be followed by an analysis in relation to the referenced literature. In order to give a comprehensive view, we organize this analysis according to the platform logic presented by Sambamurthy and Zmud (2000) discussing the concepts from literature regarding IT capabilities and design visions of UMEs (e.g. Aboyd and Mynatt, 2000; Lytyinen and Yoo, 2002; Henfridsson and Lindgren, 2005) as well as concepts of value creation (actors (Christensen, 1997; Vanhverbeke and Cloodt, 2006), currencies of value exchange (Allee, 2000), and realization of business value (Chesbrough and Rosenbloom, 2002; Chesbrough, 2003) in value networks. Drawing on this background we will discuss challenging issues related to aligning a new promising technology with existing structures.

**ADDING THE E-NEWSPAPER CHANNEL**

At present, many news publishing organizations are organized as media houses with a multiple channel publishing strategy. We start by discussing this environment and critical issues related to the alignment of a new promising technology and the ongoing development towards UME. This part mainly derives from the nine workshops. Thereafter, we discuss the visions and challenges related to the introduction of a new channel, the e-newspaper, and discuss the major issues related to the alignment with existing structures identified in the interviews illustrated with quotations. Finally, we discuss the empirical findings in relation the literature on ubiquitous information environments.

**EXISTING STRUCTURES**

During the nine workshops we have worked in an iterative process collecting participants’ views on the existing channels of today. Since only a few of the newspaper organizations have a broadcasting channel (e.g. TV and radio) we here focus on the three main environments, i.e. print, online and mobile.

**PRINT**

In the print channel the distribution is physical and the majority of media houses own their distribution, thereby controlling the whole value-chain. The value networks are to a large extent organized within the newspaper industry. Within the industry it is common to cooperate on distribution. One example is that two newspapers located nearby each other have an agreement that one of the newspapers buy the distribution service from the other.
Since the print channel has a very long history, typically more than 100 years, these networks are stable and well established. However, the business in the print channel has been experiencing declined revenues from advertising and decrease in subscriptions. In most of these organizations, this has lead to re-organizations and having to let employees go. The threat discussed to be the most pressing is that the printed newspaper does not attract young adults. Historically, the respondents mean that young adults typically starts to read and subscribe to newspapers when they start a home and a family. This pattern is now changing and these newspaper organizations are worried about the future for the printed newspaper. The respondents discuss the introduction of digital publishing as the most important reason for this development. However, the printed newspaper is still the dominant business.

**Online**

Since the mid 90’s. these newspaper organizations all have online channels. The online newspaper on the web is the dominant service but they also offer a pdf newspaper, mail services etc. In the initial years the media houses had a god economy and could afford experimenting online with little return on investment. But after a few years many of these organizations have had a long struggle to make the online publishing profitable. It has taken a long time to attract advertisers and it is very difficult to charge for online content from readers. One of the reasons mentioned for the later is that readers pay for their computer and to the internet operator for the internet access and traffic and that they therefore are not prepared to pay for content. Another reason mentioned is that building the technical environment and competence they have today has been very costly. Some of the Swedish newspapers have invested in a joint company, i.e. Citygate, for mutual development of technical solutions for online services. They share the development costs and then market the services under their own brand. Examples of such services are: stock information, dating services, weather services, games etc. Some organizations have moved the online business to separate companies or business units to be in control of the business and separate it from the print channel. These are still strongly interrelated with the printed newspaper on management level. In most organizations, the online newspapers have found their place and are considered an important channel for the media houses. The banner market has grown considerably during the last years, as well as revenues from services for which the readers register and pay. Webb TV and other multimedia content have been intensively developed the last few years and many of these organizations have employed new staff working with the web.

**Mobile**

Even though most organizations publish some simple services to mobile phones, the most common strategy is to wait and see. Investments in new technology and competence are limited in most cases. The newspapers recognize there is a big future potential in mobile services but they do not think either the users or the advertisers are mature enough. But the most important barrier for investments in the mobile channels is the revenue sharing between the content providers and the telecom operators. The newspaper organizations regard that this today is in favor of the telecom operators. There are ongoing negotiations...
between the actors in the networks of mobile infrastructures. Another problem is the diversity of devices and the lack of standards. Some of the media houses have found a way around that by developing their own downloadable programs that runs on any mobile phone. The media houses are active in developing strategies for their mobile channels and are currently trying to find suitable business models as well as to developing new and value adding services.

**RELATION BETWEEN CHANNELS**

In the workshops, one of the tasks was to compare the pros and cons related to publishing news services in print, online and mobile channels. In Table 2, we present a summary of the most common views on the pros and cons with focus on the value creation of products/services. These views are from a media house perspective as well as the respondents considerations from a consumer point of view.

<table>
<thead>
<tr>
<th>Channels</th>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Print</strong></td>
<td>No power consumption needed</td>
<td>Old news</td>
</tr>
<tr>
<td></td>
<td>Shareable</td>
<td>Waste of paper</td>
</tr>
<tr>
<td></td>
<td>Durable</td>
<td>No interactivity</td>
</tr>
<tr>
<td></td>
<td>Portable</td>
<td>Geographically limited</td>
</tr>
<tr>
<td></td>
<td>Dispensable</td>
<td>Expensive production and distribution</td>
</tr>
<tr>
<td></td>
<td>Scannable</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Good overview</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Long term and loyal customer relations</td>
<td></td>
</tr>
<tr>
<td><strong>Online</strong></td>
<td>Up to date</td>
<td>Uncertain business model</td>
</tr>
<tr>
<td></td>
<td>Always on</td>
<td>(digital content is regarded as free)</td>
</tr>
<tr>
<td></td>
<td>Interactive</td>
<td>Not mobile</td>
</tr>
<tr>
<td></td>
<td>Searchable</td>
<td>Poor overview</td>
</tr>
<tr>
<td></td>
<td>Archiving</td>
<td>Difficult to know who the reader is</td>
</tr>
<tr>
<td></td>
<td>No space limitations</td>
<td>Lost control over distribution</td>
</tr>
<tr>
<td></td>
<td>No geographical borders for distribution</td>
<td></td>
</tr>
<tr>
<td><strong>Mobile</strong></td>
<td>Anytime, anywhere</td>
<td>Expensive</td>
</tr>
<tr>
<td></td>
<td>Push and pull</td>
<td>Small screen</td>
</tr>
<tr>
<td></td>
<td>Immediacy</td>
<td>Very poor overview</td>
</tr>
<tr>
<td></td>
<td>Personalization</td>
<td>Slow (most people still have slow phones)</td>
</tr>
<tr>
<td></td>
<td>High penetration</td>
<td>Many diverse devices</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lack of standards</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bad revenue share</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Unsatisfying business model</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lost control over distribution</td>
</tr>
</tbody>
</table>

**Table 2.** Pros and cons of today's media channels

As can be seen in Table 2, the view of the pros and cons are distinguishing rather than complementary. There are many new opportunities offered for value creation in digital
channels. However, digital channels are not without shortcomings. One of the most important cons for the newspaper organizations is the lost control over distribution in digital channels which strongly affect their business models. As stated in the introduction the media houses are now facing an introduction of yet another channel, i.e. the e-newspaper published on e-paper technology. Since the e-newspaper is regarded to hold the potential of replacing the printed edition in the long run, and thereby reducing the distribution and printing costs dramatically, the media houses follow the development with interest. In Table 3 we present the expected pros and cons of the e-newspaper.

<table>
<thead>
<tr>
<th>Channel</th>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td>e-newspaper</td>
<td>High readability</td>
<td>Poor overview</td>
</tr>
<tr>
<td></td>
<td>Broad content base</td>
<td>Another device</td>
</tr>
<tr>
<td></td>
<td>No computer feeling</td>
<td>Small screen size</td>
</tr>
<tr>
<td></td>
<td>Up to date - more editions</td>
<td>No color in the beginning</td>
</tr>
<tr>
<td></td>
<td>Durable</td>
<td>Expensive</td>
</tr>
<tr>
<td></td>
<td>Mobile and portable</td>
<td>Cannibalizing on existing channels</td>
</tr>
<tr>
<td></td>
<td>Anytime, anywhere</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Environmental friendly</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Interactive</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Personalization</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Searchable</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No geographical borders</td>
<td></td>
</tr>
</tbody>
</table>

Table 3. Expected pros and cons of tomorrow's e-newspaper channel

The pros and cons related to distribution were not included in these discussions. As shown in Table 3, there are many hopes for extended opportunities comparable to visions of ubiquitous services. The cons are mostly related to the participant’s opinions of e-paper devices, but also give expression for anxiety of how an e-newspaper would affect existing channels.

In the following we will focus on insights from the 18 interviews grouped into the following themes; general visions of the e-newspaper, infrastructure for distribution, relationship to other channels, internal organizational issues, and finally external and interorganizational issues. Thereafter, we summarize the expected pros and cons of the e-newspaper channel.

**General Visions of the E-newspaper**

The respondents agree on that the greatest gain for the e-newspaper channel is the possibility of reduced distribution costs. Even though many of the respondents believe that the printed newspaper will be a parallel channel for a long time still, some think that the e-newspaper channel can replace the printed newspaper in the long run. The dream is to be able to shut down the printing press, eliminating the paper cost and physical distribution. In addition, the geographical limitations of physical distribution would be overcome as illustrated by this quote.

*The foremost opportunity with the e-newspaper is to replace the printed newspaper, to get rid of the printing press and save the woods, and to get away from the physical*
distribution... But the e-newspaper has to be very simple and mobile. That is the vision but step one will probably be to complement the other channels and in step two it might replace the printed newspaper.

E-paper devices are expected to have some level of computing capability, memory and storage capacity. Mobility was considered an important property of the e-newspaper by the respondents. They assume that for the e-newspaper to be successful and meet user expectations it needs to be mobile and pocketable and light weighted. The vision of being able to deliver news services and updates, even very local news, anywhere and anytime is regarded as an attractive opportunity for newspaper organizations. As demonstrated by the quote below, this opportunity is regarded as even more attractive if it can be accomplished with wireless technology.

Wireless updates increases mobility. All reader types are more or less mobile. Mobile workers, travel to and from work, young readers are all mobile. Even senior citizens are very mobile today. That is why I believe we will be successful; we are much more mobile today.

This is regarded as an important development towards UME. Further, added value such as location based services, personalization and context aware services are expected to be important for a successful e-newspaper. The respondents predict changed reader habits in the sense that you will have your own newspaper, that it is personal, and that you will bring it wherever you go and that you will read it several times during the day. One respondent expressed it like this.

An e-newspaper will be read from the morning until the evening, it is mobile so you will bring it along all day. It will be MY newspaper. You can take it out of your pocket whenever you like.

However, there are contradicting views on the value of personalized content. Some believe that a careful approach to personalizing content is wise with the argument that part of the news experience is “not knowing” what you will read beforehand, as demonstrated by this respondent.

I can imagine that we will customize content for different target groups, geographically and interest wise. I think personalization of content is overrated. I have never wanted personalized services for myself. I don’t think there is a mass scale reader demand for that.

The respondents all agree that attracting advertisers to the e-newspaper is a great challenge. First of all, there must be a mass scale audience. Second, the e-newspaper must have capability such as color for presenting ads. Lastly, it is regarded as very important to offer interactivity in advertisements to attract advertisers. Some of the respondents also stress that there are very interesting possibilities with this bottom-less media for new types of advertising space. As stated by this respondent searchable ads may be interesting in an e-newspaper.
To be successful in attracting advertisers color is a must. The ads must also be as effective for the advertisers as today’s ads, I mean that customers react on them. It is also important that the ads are interactive and maybe it should be possible to search for ads.

**Infrastructure for Distribution**

There are no clear opinions of which infrastructure environment that would be preferred for the e-newspaper. The thoughts on what influences these decisions are focused on capacity, cost and value-chain. The importance of stable performance and secure delivery are stressed, and are regarded as prerequisites. Capacity for multimedia content and interactivity are considered as important, as illustrated by this quote.

> For us, it does not matter what the infrastructure for distribution is, the cheapest and most effective perhaps. Satellite or broadcast, broadband internet or mobile, wireless – I don’t know. Everything is ok as long as it can handle multimedia, we must have support for that. The future is multimedia, it is only the printed newspaper that is not.

Some respondents believe that converging technology and the development towards UME will bring new and interesting possibilities. For example, this respondent thinks that GPS technology would add value to the e-newspaper.

> I think GPS technology is interesting. Depending on where you are the news could change. That would be truly mobile!

**Relationship to Other Channels**

One critical issue discussed is the e-newspaper’s relation to other channels. The respondents are anxious that adding a channel might reduce consumers’ interest in another. Some regard the e-newspaper to be a competitor to the printed newspaper. Others think it will compete with the online channels. Some believe that the development towards UME will mean that all digital channels will be integrated and together replace the printed newspaper, as illustrated below.

> I think that all channels together will replace the printed newspaper. My wish is to have one editorial department that produces multimedia material that is packaged and spread in the different channels as it suits best.

Some respondents’ hope of replacing the printed newspaper is more restrained. There is also the opinion that the printed newspaper will survive as shown here.

> I regard the e-newspaper to be a complement to other channels. I do not think it will kill the printed newspaper. That is only a wet dream. Historically new channels have started as complementing channels and then maybe replaced others. There is no channel that has been completely replaced though, except for maybe smoke signals.

There are also strategic and organizational considerations that are related to multiple channels. Some of the respondents regard the multiple channel environment of the media house to be necessary for future news publishing enterprises. In this line of thinking, one
channel would not be regarded as more valuable than another. They would be regarded as an assemblage of channels that together would reach the audience in the best possible way given the resources the reader has in the particular situation. As this respondent witness, the newspaper brand is regarded as a very important asset in UME.

*That we are a media house today, with many different channels, is not a coincidence. The foundation for choosing this strategy is that it is getting harder and harder to charge for content... We believe that our competitive advantage in the future is the newspaper brand and credibility, in new media and in multiple channels.*

Others have a strategy of prioritizing amongst the different channels, regarding some to be more important than others.

*We prioritize our efforts and investments for different channels. The order is 1) the printed newspaper, 2) the web, 3) the PDF newspaper, 4) mobile services, and if we start publishing on e-paper it will be number 5.*

**INTERNAL ORGANIZATIONAL ISSUES**

As illustrated by the quotations from the interviews with newspaper managers, adding a new channel will have an impact on the organizational structures. The organizing and competence profile of many newspapers is concentrated to the production of the printed newspaper. As new channels are introduced these structures are disturbed.

*Some professional roles will radically change. We are tremendously many editors for fairly little material. E-paper will bring a totally new way of editing. It will be more and more automated. The workload will be loading the databases and packaging the content.*

After experiencing the difficulties of getting online services profitable, many organizations cut down on technical staff. Now, this has influence on the level of technical competence among the editorial staff, resulting in educational efforts regarding digital technology and publishing, as shown here.

*We used to have more technical people, but when the dot com balloon busted we let almost all of them go, they were 80 people. They had no editorial skills. Now we are retraining editorial staff to handle the technology.*

However, the technical and competence issues are not regarded to be the most challenging. There are strong conservative traditions related to the printed newspaper that influence the attitudes towards introduction of new media. These attitudes build barriers that according to the respondents are difficult to challenge, as illustrated with this quote.

*There will not be any press stop as today, but some do not realize that. There is nothing as reactionary as a newspaper editorial staff when it comes to change. The willingness to change is zero. It is in people’s heads, you cannot even talk about shutting the printing press down. For them the printed newspaper will be there forever. To make them leave all of their traditions behind – I do not think so.*
Some respondents are even that drastic that they think they would have to re-new the entire staff, as quoted below. This is because the heritance from the long tradition with the printed newspaper is very deeply rooted in newspaper organizations.

For us to succeed with the e-newspaper we probably would have to exchange the entire staff. The e-newspaper will require a totally different competence profile than we have today. E-paper is still hypothetical to us, but we can compare with the introduction of the web. The web is still not taken seriously enough by the editorial staff. Paper is more prestigious, whereas the web is second-class.

But there are exceptions to this picture. In addition to those organizations that are companies or business units separated from the printed newspaper, the mindset in some traditional newspaper organizations is more positive. One example from a respondent in a newspaper organization positive to change and have a climate of welcoming new technology is given with this quote.

Our new editorial system is a multiple channel system. As soon as we have implemented this system we will create a channel for e-paper and test. We want to be first with e-paper. We want to hit the big dragons on their fingers. We can do that because we are not as sluggish and slow, idea to decision is a lot faster in our organization.

EXTERNAL AND INTERORGANIZATIONAL ISSUES

The most important external relationships are obviously readers and advertisers representing the two customers of a newspaper. Further, the relationships between industry actors considered to be very important. These relationships are perceived as critical for business models and for strategic alliances. The general understanding is that newspaper organizations would gain from acting on an interorganizational and international level when forming networks for the future. The disruptive effect of digital channels has lead to the awareness that every newspaper organization cannot build their own value networks and their own business models. To be competitive in UME, they recognize that interorganizational relationships are very important. To take the position that owns the customer relation is regarded to be the most important in network building as illustrated below.

The business models have to be thought through and what role we fill in it. The one who owns the relationship to the customer or reader mediates, we can stimulate each other if we own that mediator role together in an industry network.

External relationships are closely related to strategy and distribution issues. As presented above, there are contradicting views on technical and distribution issues that influence. Some organizations have an outsourcing strategy. This quote shows that concentrating competencies on content rather than on distribution is one of the reasons behind this strategy.

We have outsourced the whole IT department, we do not house any online services ourselves. Our core competence is not distribution, it is quality content. That is why we have
outsourced distribution, and technology, even the payment systems. We will have the same strategy with the e-newspaper – if it requires technical competence – outsource. If it is cheaper – outsource.

There are other organizations who regard ownership of technical solutions to be important. In some cases that ownership is a joint venture between the newspaper publishing companies, in Sweden typically between companies with the same owner. As told by this respondent, the argument for this strategy is ownership and control over distribution, reducing the complexity of external relationships needed to distribute the e-newspaper.

We as newspapers must own the distribution channel. It does not work well for us as it is on the mobile phone side. I can imagine that we can give the e-paper device to our subscribers for free and for a payment they can get access to additional content within a network of cooperating actors owning the infrastructure together.

This strategy is highly influenced by the experiences from the mobile channels. This quote shows that the worst scenario for newspaper organizations is to become a middle hand in the distribution chain.

I think a shared infrastructure among content providers is to prefer. It is important not to become dependent on one or two operating companies that build their business model on holding the content provider as their hostage.

Summing up, the empirical material presented gives a comprehensive view of considerations related to the alignment of a new publishing channel. In the following we will present an analysis in relation to the literature.

ALIGNING THE E-NEWSPAPER IN A UBQUITOUS MEDIA ENVIRONMENT

We start the analysis by presenting a graphical overview of considerations related to the alignment of the e-newspaper within the existing multi channel environment drawn from the interviews and workshops (Figure 10). As can be seen in Figure 10, the multi channel environment is very heterogeneous. The number and character of relationships differ from channel to channel. Since the efforts and investments required from customers differ between infrastructure environments, the value offer needs to be differentiated between channels. Clearly, the decisions on infrastructure for distribution have consequences for value networks and business models. Drawing on the visions of a future UME, coping with the heterogeneity between value networks in different infrastructure environments will be a core challenge.
Hereafter, we discuss the most critical considerations by discussing the empirical findings in relation to the literature on distribution of services in ubiquitous information environments and on value networks. In order to get a comprehensive view of challenging issues, we have organized the discussion according to the platform logic by Sambamurthy and Zmud (2000), i.e. IT capabilities, relational structures, and integration structures.

**Figure 10.** Considerations related to the alignment of the e-newspaper within the existing multi channel environment
IT CAPABILITY

Anytime and anywhere delivery of services for the e-newspaper channel is considered to be the most promising possibility by the media houses in our study. Some of the pros mentioned as the most important for the e-newspaper channel are the possibilities of personalization and local awareness. As illustrated by the quotations, there are however contradicting views on the importance of personalization. Still it is anticipated that the IT capability of the infrastructures and e-paper devices (i.e. an eReader device) must have support for location awareness and personalization functionality. Further, supporting user’s dynamic movements between physical and social context (Lyytinen and Yoo, 2002) and seamlessly support fluid use patterns (Henfridsson and Lindgren, 2005) are capabilities anticipated to be of importance for an effective UME. As a result, devices in UME need to be functional in multiple infrastructural environments. Moreover, the eReaders for consuming the services offered through this channel need enough computing capacity, memory and storage to support these capabilities as well as to support multimedia content presentation. These capabilities are also important to leverage value to advertisers. There is a contradiction in the product development between IT capacity of the eReaders and the demand for a pocketable and light weighted device. Consequently, one important issue to address when aligning the e-newspaper with existing structures is: What are the requirements on devices to leverage customer value in UME?

Some of the capabilities of UME are related to a well functioning return channel as shown by the empirical evidence. In some cases automatic identification of device, location and other information related to context (Abdoy and Mynatt, 2000) need a return channel. As suggested by one respondent, GPS technology might be used to locate readers. In other cases users might actively be using a return channel, to interact with content such as advertising or to make a comment or send a picture. The requirements on the return channel are related to the publisher push and/or pull strategies of service offers. The capabilities of managing and storing the information flow, as well as package and deliver information and knowledge back to for example advertisers are important parts of value creation in UME. Added to this, the return channel is a prerequisite for systems to be aware of users’ context and for users to be aware of the environment. This is ideally as unproblematic for users as possible and preferably wireless. The second critical issue to address is therefore: What are the requirements of return channels to enable value creation in UME?

The capacity of the integrated infrastructures for delivery in UME is of course fundamental for value creation. In the study it was shown that all media houses are convinced that the news services of tomorrow are multimedia content based. Thus, the assemblage of technologies used for distributing the e-newspaper content need to have capacity for heavy traffic as well as for a large variety of data formats (March et al., 2000). Furthermore, the infrastructure must be flexible and open to new types of technologies to meet the expectations by the media houses. Delivery anytime and anywhere puts requirements on well functioning integration structures cross infrastructure environments. Therefore, an
important question for distribution is: **What is the minimum capacity level for integrated distribution infrastructures in UME?**

In UME the value offer to consumers is built on the features of mobile and ubiquitous services. In the interviews it became clear that newspaper organizations do not expect consumers to pay for content or services, the value currency between the content provider and consumer is ubiquitous services in exchange for market communication exposure, i.e. an intangible value currency (Allee, 2000). The respondents believe that the monetary revenue will come from the value exchange from the advertiser who will pay for communicating with their markets in UME. The added values to the advertiser besides exposure are increased targeting and information and knowledge about customers reaction, i.e. knowledge currency (Allee, 2000). These values are created through the features of ubiquitous services. Given the characteristics of UME, these values cannot be built on single devices such as eReaders (Lytytinen and Yoo, 2002), these values need to be co-created cross channels, independently of infrastructure environment. As a result, the following issue is important to address: **How can value be created independently of device and infrastructures in UME?**

**Relational Structures**

As our empirical findings show, the development towards UME will have large impact on the media houses. The structures for organizing competence, IT management and value networks are all challenged. The logics for governing an environment of this character need to be rethought (Sambamurthy and Zmud, 2000). As testified, there are conservative attitudes and traditions in these organizations that are difficult to overcome. In addition to this, the interorganizational and customer relationships of the media house are challenged. One important aspect is the relationship to customers, in this case readers as well as advertisers. In the case of the printed newspaper the organizations own the distribution, or they have an alliance with another newspaper organization that does. In these cases they also own the relationship with the newspaper reader. For online and mobile channels the ownership of distribution is outside the media house, and sometimes the customer relation goes via an operator. These conditions have impact on the value chains and business models (Chesbrough, 2003), thus it is important to understand business needs in relation to ubiquitous information environments (Andersson and Lindgren, 2005; Jonsson et al, 2008). As the empirical material show, this is one of the major issues for the media houses when aligning a new technology with existing structures. Given the characteristics of value creation in UME it can be expected that co-creation of value and flexible relationships are required to leverage customer value. Consequently, an important question is: **What are the desired structures for ownership of distribution and customer relations to enable value creation in UME?**

The study gave evidence that the media house is part of a complex world with different alliances and structures for relationships in different channels. In addition to this heterogeneity, each channel infrastructure has its network regulations, industrial standards and actors. In a global infrastructure, these relationships are increasing in numbers (Lytytinen
and Yoo, 2002). As described by the empirical data, some of the organizations have formed joint efforts to handle these relations. According to literature (Chesbrough and Rosenbloom, 2002; Vanhaverbeke and Cloont, 2006) this approach is essential to be able to realize the inherent values of UME. On top of this, there are two different customer groups, consumers and advertisers, demanding for different values, enabled by different types of technical solutions, but still interdependent. When aligning the e-newspaper it is therefore important to ask: What are the desired relations to providers of technical solutions to enable value creation in UME.

Integration Architectures

The media houses discuss new structures for interrelationships regarding the integration of IT capabilities with business networks, relations to distribution owners and technical solution providers. The empirical data disclose the uncertainty and tension in the relationships with for example telecom operators. Accordingly this is a challenging avenue of large scale with many contradicting interests involved. Still this is a key area for strategic decisions (Lyytinen and Yoo, 2002; Samabamurthy and Zmud, 2000). Further, these integration structures must have the flexibility, the preparedness and the alertness that is required to meet the constant development and convergence of technology, the numerous and variety of devices as well as changes in customer needs and expectations. This means that roles of the participants in the value network might change for each delivery depending on users’ actions. As discussed by Vanhaverbeke and Cloondt, (2006) this also means that the incentives and value exchanges change. This is an escalation of the characteristics of the digital economy as discussed by Amit and Zott (2001) and requires open and flexible value network structures (Allee, 200; Chesbrough and Rosenbloom, 2002). Drawing on Samabamurthy and Zmud’s (2000) discussion on integration architectures, the overall question is: How should the network structures for value creation be integrated with the IT capabilities of UME for a successful business agenda?

As discussed in literature (Lyytinen and Yoo, 2002; Samabamurthy and Zmud, 2000) and shown by the interviews the organizational structures and competence profile is challenged by the development towards UME. The disruptive effect (Christensen, 1997) of new publishing channels causes re-configuring internal value creating networks. This includes re-defining the core competencies and resources required to create value. The empirical material also suggests that this includes changing attitudes and mindsets within the existing work force. As a result, when aligning a new technology to UME the following question needs attention. What is the desired internal network structure of a content provider in UME?

In Table 4, we summarize the challenging issues related to the alignment of a new promising technology in UME.
### Platform Logic Components
(Sambamurthy and Zmud, 2000)

<table>
<thead>
<tr>
<th>Platform Logic Components</th>
<th>Challenging issues</th>
<th>Corresponding considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT Capabilities</td>
<td>Device capabilities</td>
<td>• What are the requirements on devices to leverage customer value in UME?</td>
</tr>
<tr>
<td></td>
<td>Return channel capabilities</td>
<td>• What are the requirements of return channels to enable value creation in UME?</td>
</tr>
<tr>
<td></td>
<td>Capacity and integration of infrastructures</td>
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<td></td>
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<td>• How can value be created independently of device and infrastructures in UME?</td>
</tr>
<tr>
<td>Relational structures</td>
<td>Role of distribution</td>
<td>• What are the desired structures for ownership of distribution and customer relations to enable value creation in UME?</td>
</tr>
<tr>
<td></td>
<td>Role of technology solution provider</td>
<td>• What are the desired relations to providers of technical solutions to enable value creation in UME?</td>
</tr>
<tr>
<td>Integration architectures</td>
<td>Integration of network structures</td>
<td>• How should the network structures for value creation be integrated with the IT capabilities of UME for a successful business agenda?</td>
</tr>
<tr>
<td></td>
<td>Internal network structure</td>
<td>• What is the desired internal network structure of a content provider in UME?</td>
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**Table 4.** Alignment issues and considerations in relation to the platform logic components

In the following section we will discuss the practical and theoretical implications of these findings.

**DISCUSSION**

This study aimed at exploring challenges of aligning new technology with existing value networks enabling value creation in UME and to put the different issues discussed in literature into a more detailed perspective. We did so by studying newspaper organizations as focal actors enacting in the DigiNews project with the incitement of finding new business opportunities by unfolding potential value of the e-paper innovation in newspaper publishing market. This resulted in a comprehensive description of considerations related to the alignment of a new promising technology, the e-newspaper, with existing value
networks. Indeed this study demonstrates that there are implications for all components of organizing business and technological environments (Sambamurthy and Zmud, 2000) when aligning a new technology with existing value networks in UME. As shown in the previous section there are many promising opportunities of an e-newspaper and a development towards UME but there are many challenges to address (see Table 4). Hereafter we will discuss the implications of these challenges for management and the contribution to literature.

**PRACTICAL IMPLICATIONS**

This study indeed portrays the complexity of value networks in UME and the complex and challenging issues management need to address. There are risks of re-experiencing the problems and disruptive effects of digital media if newspaper organizations do not take these challenges seriously. Even today, the parallel networks in different infrastructures cause uncertainty of value creation and the associated value networks and business models. Given the assumptions and visions of UME presented in this paper, it can be anticipated that value networks in UME will be required to be very open, cross existing boundaries, organizational, interorganisational, technical, as well as cross existing value networks. To realize the inherent values, all of these boundaries are challenged since services and content delivery will be driven by customers’ needs and behaviors.

Management in newspaper organizations would gain from developing a more open and flexible approach to the relationships and exchanges forming value networks. Today, some of these organizations are “stuck” in traditional mindsets of the printed newspaper. The consequence is an internal entrance barrier opening up for other actors to create gain the market in the new environment. As shown by the character of the challenges when aligning a new technology in an emerging UME, strategies cannot be built on tradition model of publishing newspapers. For those newspaper organizations that are not capable to unleash of the historical straightjacket, the doomsday prophets foreseeing the death of traditional newspapers might be right.

Co-producing value in dynamic networks, recognizing that readers and advertisers, infrastructure and technical solutions providers are all part of the networks, together with an open approach spanning the boundaries of traditional thinking (selling information to readers and exposure to advertisers, total control over value chain, building all solutions in-house, only cooperating within their own domain etc) is recommended. In addressing the challenges described with the case of introducing the e-newspaper this shift in strategic view has surfaced. Some organizations have realized that exchanges of knowledge and other intangible values are as important as traditional value exchanges between participants in external value networks in the networked digital economy. These organizations have expanded their tradition of cooperation of technology (competing with content) competence boundaries (internally) and cross industry boundaries.

Our ambition is that the list of challenging issues can serve as useful guidance for management when preparing for the alignment of a new technology and the development towards UME. Even though the development towards UME involves numerous and difficult
challenges, there are many new opportunities for the news publishing industry. These opportunities may lead traditional newspaper organizations into a new era, aligning new digital publishing with their core business and competences of journalism, publishing technology and market communication. We believe that this illustration of considerations for news publishers, could apply to any organization providing services for a wide audience in a ubiquitous information environment.

CONTRIBUTION TO LITERATURE

In line with previous research (see e.g. Lytyinen and Yoo, 2002; Andersson and Lindgren, 2005; Jonsson et al, 2008) this study disclose the heterogeneity of ubiquitous information environment. This study contributes to previous research with increased understanding of implications of the heterogeneity to value networks in UME. To realize the inherent values of UME, the value networks must be open (Vanhaverbeke and Cloodt, 2006), flexible (Allee, 2000) and even fluid to cope with e.g. fluid use patterns, converging media, infrastructures, technology and emerging standards.

Traditional basis for value creation and business models such as media channel, device or infrastructure for delivery will not be utilizable. In newspaper industry, value creation is dependent on type of customer (in general reader or advertiser), on device (such as paper, computer or mobile), and on the infrastructure for distribution. At present these are parallel structures and conditions for value creation, i.e. value differs between customer groups and channels. However, the development towards UME is changing this, for example the mobile internet is one example of the effect of convergence. In UME the value creation will depend on user needs and actions to a much larger extent and on user demand. Anytime, anywhere, seamless, location based, and personalized service delivery in any convenient way requires just in time service delivery on new and fluid terms. The value creation process and the value networks cannot be design on assumptions of use situation or technical capabilities of devices and infrastructures. Neither will traditional groupings of customer segments be utilizable.

Moreover, the relationships in value networks will change. Depending on user actions and individual preferences different stakeholders might have the primary customer relation or be in a mediating role. As this study shows the stakeholder in control of distribution is often the owner of the end customer relation and thereby holds a power position in the value network. In UME, the stakeholders in control of distribution might be interrelated during service delivery. That means that the roles in the value network are fluid depending on what, when, where and why an action is taken by a user.

This fluid nature of value networks in UME will also apply to the value exchanges between stakeholders. Given the different context for user actions the same service and content might provide different value. For example, a user might be willing to pay for a service in one situation but not in another situation for the same service. In some cases advertisers may have an interest in exposure and in other cases not, even though the value to the customer might be equivalent in both cases. In summary, these changing conditions result in
interrelated and fluid value networks which in turn mean that the value exchanges, currencies, relations and roles in the value creating process will change in very short cycles.

**CONCLUSIONS**

In this paper we addressed the research question: *What are the challenges when aligning a new promising technology (such as the e-paper) with existing value networks enabling value creation in UME?* To address this question we have conducted a literature review of infrastructure issues in ubiquitous information environments and literature on value creation and value networks. Drawing on this literature together with empirical results from 18 interviews and 9 workshops with newspaper representatives in Sweden, Belgium, France and the Netherlands, we suggest eight challenging issues, presented in section 6.

This study shows how the heterogeneity of ubiquitous information environments influences value networks. In this paper we have discussed that enabling value creation in UME requires fluid value networks. The value networks are formed and reshaped on the basis of user needs and actions, i.e. a pull oriented rather than push oriented architecture. The fluid nature means that the value creating processes, value constellations and relationships, and value exchanges and currencies might change for each service delivery, i.e. in very short cycles. This requires an enormous openness and flexibility and challenges existing ideas of boundaries in the digital economy. As a consequence it can be suggested that organizing business and technological environments cannot be separated from value creation processes. To enable the envisioned values of ubiquitous environments all of the components of a business platform might need to be co-produced in integrated networks and not separated by the boundaries of traditional practices.

There are several limitations to this study. First, the broad approach to challenges should be followed by deeper investigation with concerned stakeholders to verify the significance from several viewpoints. Second, the notion of fluid value networks should be validated in other industries where ubiquitous information environments apply.

**REFERENCES**


INTERNET REFERENCES


ABSTRACT
Adoption of mobile services and m-business outcomes has not yet reached expectations. The uncertainties in m-commerce are still many occasioning a need to explore challenges and opportunities. This study provides empirical data on perceptions of value proposition in m-commerce from the supplier as well as the demand side. The first is addressed in an interview study with newspaper publishers that offer mobile services, and the second in a broad survey of 1388 mobile service users. The findings show that there are similarities as well as differences in perceptions of value held by service providers and users of mobile services. Ubiquity and service provider/user relationship were identified as general service characteristics whereas localization, personalization, convenience and socialization were identified to be mobile service value dimensions. The aim is to provide useful insights for service providers to better meet the market demands in consumer m-commerce.
1. INTRODUCTION

New and improved technology in computing and telecom enable anytime, anywhere access to mobile services in mass-scale through a multitude of devices (Lyttinen and Yoo, 2002). Today, the penetration of mobile phones is very high, in 2006 as high as 110% in both Italy and Sweden [1]. Given this, hopes for lucrative business of mobile services have grown among service providers. However, in spite of this development the mobile service market has not met expectations (see e.g. Carlsson et al., 2006; Constantinou et al., 2005).

A growing body of research into mobile services and m-commerce has sought to understand the reasons for this disappointing development (Amit and Zott, 2001; Carlsson et al., 2005; Constantinou et al., 2006; Mallat et al., 2006; Pedersen et al., 2002; Samtini et al., 2003; Sarker et al., 2003; Vrechopoulos et al., 2003). Among the explanations are usability factors, technological factors and business model related factors. Indeed, the sources of uncertainty are many (Tilson et al., 2004). One of these uncertainties is related to the relative novelty of m-commerce, making it very difficult to calculate how people act as a response to a new services. The rapid introduction of new mobile technology and new services has led to a situation where new appliances and services are experimented with. As people are introduced to new technology uses, initially it is integrated with daily habits. The ubiquity of mobile services challenges peoples old habits, and these are difficult to break (Jessup and Robey, 2002). In turn, as use patterns changes new demands and expectations emerge which leads to uncertainty about what people value and are willing to pay for (Tilson et al., 2004)? Thus, understanding value proposition in m-commerce is indeed a pressing issue.

As pointed out by Keen and Mackintosh (2001) there is a need to understand the supply side as well as the demand side of value proposition. In line with this argument this paper will seek to understand value proposition in m-commerce by empirically addressing both sides. With the above in mind, this research is set out to conduct a study that explores the various aspects of value proposition in m-commerce by addressing the research question: how do content providers define value proposition of mobile services and how are these values perceived by users (consumers). The study is limited to the value proposition related to services offered to a wide audience on a consumer market. This paper aims at contributing to the understanding of value proposition in m-commerce by providing service providers with useful insights to better meet the market demands.

The context studied here is newspaper organizations offering mobile services to a wide audience. This is a good setting to study since the possibilities and opportunities in m-commerce are especially attractive to these companies (Ziv, 2005). Their core business is information and news services In addition, this industry is undergoing radical change towards a ubiquitous media environment within which mobile services offered in the telecom infrastructure is an important part (Åkesson and Ihlström, 2006). Moreover, as the
disappointments described above have been experienced by these organizations this setting is especially interesting to study.

The remainder of this paper is structured as follows. Section 2 presents a brief overview of literature addressing mobility and value proposition in m-commerce. Then, a description of the chosen research approach is given in section 3, and the empirical findings are presented in section 4. This is followed by a discussion of the findings in section 5, and finally, in section 6 some concluding implications will be discussed.

**Value Proposition in M-commerce**

Value proposition is a classical concept in marketing and can be understood as the relationship between an offer and customer needs (Porter, 1998). In the case of consumer mobile services the value proposition can be to satisfy user needs of information such as news and stock-market reports or entertainment such as games and music downloads in mobile settings (Clarke, 2001; Camponovo and Pigneur, 2003). Value proposition in m-commerce build on the fundamental benefits of mobility.

The concept of mobility is not limited to user's physical movements, mobility is also related to the interaction people perform (Kakihara, and Sørensen, 2001). There are three dimensions to mobility; spatiality, temporality and contextuality. Spatiality refers to geographical movements of users and resources, temporality to time aspects, and contextuality to physical and social circumstances.

Still, the most fundamental benefit of mobile services is of course the ability to wirelessly access services in different locations and through mobile devices (Lyytinen and Yoo, 2002). This enables to make use of user's location in service offers. Location-based services add value by utilizing this information and are regarded as a core feature of future mobile services and a possible source for revenue growth (Tilson et al., 2004).

Another beneficial feature of mobile services is personalization (Abowd and Mynatt, 2000; Lyytinen and Yoo, 2002; Rao and Minakakis, 2003). Personalization increases personal relevance by making it possible to customize services to personal preferences and interests.

Temporality or time aspects are of course also important for customization. Mobile value can differ depending on time setting (Anckar and Dîncau, 2002). Alerting services and remainder services can be of value in time critical arrangements. Services such as games and entertainment can be of value for killing time or having fun. In situations where dead time slots, such as waiting for flight, efficiency ambitions might be the benefit of using mobile services.
However, benefits of mobile services are perceived differently in different contexts (Mallat et al., 2006). In a study investigating mobile ticketing services for public transportation, Mallat et al. (2006) found that intention to use mobile services are influenced by use situation circumstances such as availability of other alternatives and time pressure in the service use situation. This indicates that benefits of mobile services are dependent on the situation in which they are used.

In the Telecom industry, the value of mobile services is strongly related to the features described above. NTT DoCoMo [2] presents guidelines including the features; constant updates, that content needs to be clear and comprehensive, and to provide accesses to related information. Further, the services need to be readable, understandable and esthetically attractive. These are the minimum requirements for publishing content in the NTT DoCoMo portal for i-mode services. NTT DoCoMo has defined that to provide user value at an affordable price services need to provide immediacy, ubiquity, mobility and utility. In other words, the services need to be available when and wherever the user needs them. At Nokia [3], mobile service experience quality is regarded as having two dimensions: reliability and comfort. Reliability is described as the availability (anywhere), accessibility (anytime), and maintainability of the content, network and/or user device application. On the other hand, comfort is described as the quality of content, the bearer service and/or the software features of the device (ease of use).

There is also literature addressing value more specifically related to m-commerce such as m-business value-chains (Camponovo and Pignuer, 2003), a framework explaining customer and network value relation to business viability (Bauman et. al., 2005), and exploration of attributes perceived as important by consumers for making m-commerce choices (Mahatanankoo et. al., 2004). Value proposition has been explicitly addressed with a suggested conceptual framework for m-commerce described as a value life-cycle (Osterwalder and Pigneur, 2003), and a typology for value proposition dimensions (Clarke, 2001). Clarke (2001) summarizes the unique value proposition dimensions related to m-commerce to be: ubiquity, convenience, localization, and personalization (see Figure 1).

![Figure 1. Value proposition of mobile commerce (Clarke, 2001) p. 137.](image)
Ubiquity refers to value offerings that will be provided everywhere and anytime. Convenience is related to the factors creating time and place utility for users, i.e. the service can be used at their convenience. Localization is about value is on the relevance depending on users geographical position. Finally, personalization regards value propositions based on individual preferences. Clarke (2001) suggests this to be a generic topology to understand customer benefits from m-commerce.

Given this portrayal, it can be acknowledged that values of mobile services are unique. Consequently, value proposition is difficult to communicate to the intended audience (Ostwalder and Pigneur, 2003). Offering mobile services is certainly a complex adventure for service providing organizations. The goal with this study is to contribute to reducing this complexity. In this paper, the typology by Clarke (2001) will serve as a typology to analyze publishers and users perceptions of mobile service value. In this paper the aim is to investigate what publishers intended values are and how users that have adopted mobile services and regularly use them value, rather than explaining what drove them to use mobile services in the first place. Therefore the typology by Clarke (2001) is suitable. First, this typology is generic in that it addresses the benefits described above, second it addresses mobile service value from an m-commerce perspective in that these values are seen as value dimensions of a mobile service from a consumer perspective rather than as dimensions of the mobility concept.

RESEARCH APPROACH

The research presented in this paper was carried out within a two-year European research project exploring future mobile news services, DigiNews (ITEA 03015), finished at mid-year 2006.

In order to explore content provider as well as user perceptions the study needed to adapt methods suitable for different contexts. Therefore, we have taken a multi method approach (Mingers, 2001). Using multiple methods in m-commerce research has been recommended by Leher and Watson (2001). First, newspaper staff involved in new digital media and development of future services and business models were interviewed. Second, the findings from interviews were used as a basis for a broad survey studying how users perceive value propositions. In both studies, mobile services offered by the newspaper organizations were addressed such as news services and information services.

INTERVIEW STUDY WITH CONTENT PROVIDER

The selection of respondents was done on the basis of engagement in the development of new services and business models. The interviews covered topics related to the scope of the project, however the reporting in this paper is limited to topic of mobile services and value proposition. In total, there were 18 interviews with newspaper staff (see Table 1).
Table 1. Overview of interviews and respondents

<table>
<thead>
<tr>
<th>Newspaper</th>
<th>Title</th>
<th>Date</th>
<th>Abrev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Norrköpings Tidningar</td>
<td>Editor-in-chief new media</td>
<td>Aug 25th 2004</td>
<td>NT1</td>
</tr>
<tr>
<td>Östgöta Correspondenten</td>
<td>Business developer</td>
<td>Aug 25th 2004</td>
<td>ÖC1</td>
</tr>
<tr>
<td>Sydsvenskan</td>
<td>Marketing manager</td>
<td>Sep 16th 2004</td>
<td>SS1</td>
</tr>
<tr>
<td>Sydsvenskan</td>
<td>Layout director</td>
<td>Sep 16th 2004</td>
<td>SS2</td>
</tr>
<tr>
<td>Sundsvalls Tidning</td>
<td>Quality Assurance Manager</td>
<td>Oct 6th 2004</td>
<td>ST1</td>
</tr>
<tr>
<td>Sundsvalls Tidning</td>
<td>Editor</td>
<td>Oct 7th 2004</td>
<td>ST2</td>
</tr>
<tr>
<td>Sundsvalls Tidning</td>
<td>Web publisher</td>
<td>Oct 7th 2004</td>
<td>ST3</td>
</tr>
<tr>
<td>Aftonbladet</td>
<td>Editor-in-chief new media</td>
<td>Oct 20th 2004</td>
<td>AB1</td>
</tr>
<tr>
<td>Aftonbladet</td>
<td>Layout director</td>
<td>Oct 20th 2004</td>
<td>AB2</td>
</tr>
<tr>
<td>Göteborgs-Posten</td>
<td>Development director</td>
<td>Oct 27th 2004</td>
<td>GP1</td>
</tr>
<tr>
<td>Göteborgs-Posten</td>
<td>Managing Development Editor</td>
<td>Oct 27th 2004</td>
<td>GP2</td>
</tr>
<tr>
<td>Sundsvalls Tidning</td>
<td>CEO</td>
<td>Nov 24th 2004</td>
<td>ST4</td>
</tr>
<tr>
<td>Concentra Media</td>
<td>Head of research</td>
<td>Mar 23rd 2005</td>
<td>CM</td>
</tr>
<tr>
<td>Norrköpings Tidningar</td>
<td>Head of Editorial Department</td>
<td>Apr 27th 2005</td>
<td>NT2</td>
</tr>
<tr>
<td>De Telegraaf</td>
<td>Director of new media</td>
<td>Nov 22nd 2005</td>
<td>DT1</td>
</tr>
<tr>
<td>De Telegraaf</td>
<td>Development officer</td>
<td>Nov 22nd 2005</td>
<td>DT2</td>
</tr>
<tr>
<td>De Telegraaf</td>
<td>Editor</td>
<td>Nov 22nd 2005</td>
<td>DT3</td>
</tr>
<tr>
<td>Le Monde</td>
<td>Chief Operations Officer and Managing Director</td>
<td>Feb 3rd 2006</td>
<td>LM</td>
</tr>
</tbody>
</table>

The 18 interviews were 60-90 minutes long and followed a semi-structured interview guide aiming at consistency between the interviews. While allowing individual perspectives to emerge the interview guide provided a systematic way of delimiting topics discussed in the interview (Patton, 2002). The interviews were all recorded and transcribed. The data collected in the interviews was coded and sorted according to the generic typology of value proposition dimensions as described by Clarke (2001) i.e. ubiquity, convenience, localization, and personalization. There were data that did not fit into this typology, which was analyzed to find common patterns. This resulted in the emergence of a fifth dimension of value proposition, here named socialization.

**Survey of Mobile Service Users**

A questionnaire was presented at the web sites of three Swedish newspapers; Aftonbladet, Göteborgs-Posten and Sundsvalls Tidning, during April 2006 (see Table 2).

<table>
<thead>
<tr>
<th>Newspaper</th>
<th>URL</th>
<th>Unique visitors/day</th>
<th>Total no. of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aftonbladet</td>
<td>aftonbladet.se</td>
<td>1,200,000</td>
<td>3757</td>
</tr>
<tr>
<td>Göteborgs-Posten</td>
<td>gp.se</td>
<td>41,500</td>
<td>135</td>
</tr>
<tr>
<td>Sundsvalls Tidning</td>
<td>st.nu</td>
<td>14,500</td>
<td>447</td>
</tr>
</tbody>
</table>

**Table 2.** Newspapers hosts for questionnaires and number of respondents
Web samples can be regarded as representative as traditionally collected samples because of the heterogeneity of the online population (Buchanan and Smith, 1999). There is of course a risk of respondents submitting several questionnaires, therefore we blocked for more than one submission per IP number.

The questionnaire was divided in four parts concerning background data, business models for digital news services, preferences for future electronic news, and value of mobile services. The fourth part about mobile services was only presented to mobile service users. The respondents that had given an age under 15, those who did not complete or answered the questions contradictorily were excluded from the dataset. The dataset contains 3626 respondents of whom 1388 (38.3%) are mobile services users and 2238 (61.7%) do not use mobile services.

The questions about mobile services were constructed from the five value proposition dimensions identified from literature and the analysis of data from newspaper publisher organizations. This resulted in 31 statements with a 7-grade Likert scale.

The responses to the questionnaire were analyzed using SPSS v14.0. The analysis focused on calculation of mean scores and standard deviations for each statement. The goal was to generate an overview of what seems to be of importance for user perceptions of value within each value proposition dimension.

To validate the typology of value proposition dimensions, a factor analysis was used. This provided a classification of how users perceive value and allowed the elimination of items with low factor loadings. Further, this approach allowed us to explore new relationships of value proposition dimensions. For sample sizes 350 and larger the significance level for a factor loading is 0.30 or above (Hair et al., 1995). In the factor analysis 15 items with low factor loadings (>0.3) or cross-factor loadings were eliminated to ensure the factors to be unidimensional and distinct.

**FINDINGS**

First, the results from the interview study are presented followed by the findings from the survey.

**INTENDED VALUE PROPOSITION**

**BACKGROUND**

The newspaper organizations in this study differ in size and scope. Some are small local newspapers, some are large nationwide newspapers. However, they have a common branch interest in exploring the opportunities of mobile services and in assuring their position as
content providers in mobile media, for the user/consumer market as well as the advertiser market. The prior is the interest discussed in this paper.

Some offer simple news headlines or SMS based alerting services and some offer advanced services such as personalized sport services and location-based guide services. These services are offered through different operator portals or even by-passing telecom operators by software downloadable directly to the user’s phones.

When discussing the overall challenges with mobile service offerings the newspaper organizations emphasize the challenge of ensuring user value greater than the technical challenges. Another critical issue emphasized is the revenue split between the different stakeholders in the telecom value-chain, nevertheless this topic is out of the scope of this paper. Hereafter, the findings from the interviews related to value proposition dimensions are reported.

**Ubiquity**
The respondents in this study agree that future users will expect services to be available at any location at any time which will require 24/7 publishing. The interviewees regard this as one of the most important opportunities, to provide services to their local or national audience while on travel or on vacation as well as commuting to work.

To offer this value, the understanding is that content must be relevant to users situation. Some of the respondents with the most experience from offering mobile services recognize the challenge of predicting uses perceptions of relevance and thereby being able to integrate relevance in the service offer. They have experiences from successful services such as real-time news and sports results, but there are also services that have been less successful and have been drawn back such as real-time auction services. Relevance is regarded as a very important aspect of value by the respondents meaning that relevance is related to individuals as well as groups of people sharing some common interest. To add relevance to mobile services, targeting of audiences is regarded to be the key as illustrated by this comment:

> Well you can target with device or with content? Initially we asked - Who has a mobile phone? and maybe adapt content to that group of people. Or you can think - Who needs this content? then publish it where you reach these people.

**Convenience**
To offer convenience value analyzing how a user or a group of users can benefit from a service to their own convenience is essential. One aspect of added value discussed is how to support people’s everyday life with services offering utility and experiences that the users desire. This can be services of communication and information utility or services that entertain as well as provide e.g. a learning experience. This means that the newspapers are expanding their service repertoire into new areas as this comment shows:
Since we started to think in user experience we have considered going into new areas. There are some new areas we like to go in to that we are not in today. Dating services, entertaining services, local services, now we have different categories or types of services. Notification and alerting services – must come first – before the news is published. People want to be the first who knows... Entertainment, games, movie selections etc, and information services like, weather, you name it.

A big challenge for offering these values is regarded to be the limitations of the devices, especially the limited screen size. Part of the convenience value is regarded as the ability for users to get a good overview of service offerings as well as the contents within a service.

**Localization**

The most important aspect that these interviewees agree on is that news and other services should be locally anchored. This is of course regarded as very important by the smaller local newspapers as this is the core of their business. However, making use of user's physical location is an opportunity that is discussed with mixed feelings. There is a tension between usefulness of location information and the integrity of the user. For example, the risk of advertising based on location being perceived as SPAM is one issue mentioned. There is a fear that this could violate the reputation of newspapers as respective service providers, which would be damaging to the whole branch. To avoid integrity problems some newspapers have tried pull advertising via sms or digital coupons, i.e. the user has actively agreed to the advertising. However, few users choose to request for these types of advertisements. Rather than recognizing an individual's position, some of these respondents believe that localization can be used to bundle news services relevant to a geographical area, thereby not in conflict with personal integrity. This could be combined with a fixed set of services related to user's home area, always available wherever they are. Consider the following comment on positioning possibilities:

*For mobile news there is a possibility of working with GPS. Depending on where you are the news content changes. If you are in New York for example you would get the New York news but also the biggest news from home.*

Another aspect of localization that is regarded important is adaptation to the time of day at the location where the user is. Some services and information have different relevance during the day. Adapting services and advertising to time of day is referred to as day-parting and is an important part of the 24/7 publishing strategy for most of these newspapers.

**Personalization**

The majority of the respondents regard personalization as a very important dimension of the value proposition as the mobile phone is a personal device. To make the most of this value dimension it is not enough to know where the users are and what type of phone they have, information about the individual in possession of the phone is also required about private recreational as well as work related preferences. There have been attempts to make users define their profiles and their device properties on web-sites to make possible to personalize
services and advertising to their preferences. However, this has not been as successful as hoped for. People often think they will appreciate personalized services when asked, but when there is an effort required to build up the profile the user does not take the time. In addition, the format of how news is presented will change due to personalization. The selection of news has traditionally been based on the thought of what is interesting to everybody. In this discussion the individual’s interest is central as illustrated by this quote:

*If we can recognize the person who is reading we can get closer to people. News is getting more and more individual. For example, foreign news is losing interest, more local is more interesting. ...We believe in getting closer not further, narrowcasting... The value of real or traditional news is diminishing. Alerting is therefore high on the agenda, far more personalized.*

However, there are respondents that are skeptic to personalization. Especially when it comes to news there are limitations to how personal news services can be if you still want to enjoy the experience of news. Part of that experience is considered to be the talk about the news with others. There is also a tension between personalization and news publishing interests. Some of the respondents do not want the user to be able to choose not to read the head news or choose not to be exposed to advertising. There is a limit to how much personalized they will allow their content to be.

**Socialization**

As illustrated above, the relations to the audience are developing to be another in mobile media than in traditional media. The relational and social aspects are considered to be central. In tradition, newspaper organizations have built relationship on the trustworthiness and seriousness of the newspaper brand. The brand is not only regarded to be manifested in the newspapers name but also in the visual appearance, the journalistic competence, and in the tone of voice, and their dialogue with their audience. All of these newspaper organizations have a long tradition of publishing news and have over time built strong brands. All respondents agree that bringing the brand in the mobile services is crucial to be able to enforce the relationship with the audience. This aspect is considered to be an important value for users. As illustrated by this quote, this is a strategy for long term relationships with their audiences:

*It is more important to build relations to your readers today. We are going from mass media to relation media... We must add stickiness to our brand, it is about not only bringing the news but also to help people with added services on very cheap basis. If you can stick those services to your brand, then you will be a friend, a family and friendship is worth a lot.*

Another aspect of socialization is people’s willingness to contribute with content. People have a desire to be seen and to share experiences, ideas, opinions etc., not only with people they know, that can be done by private communication such as phone calls, mail and sms, but also sharing with a wider community, more public such as moblogs. Therefore these respondents expect that mobile users are willing to contribute with user generated content.
Some of these respondents see an opportunity in supporting this community building. However, there are also representatives of a more hesitant attitude to supporting community building, with regards to independent news reporting as shown by this statement:

*I believe in communities and memberships business wise, but is that our role? The newspaper cannot sell out its independency.*

**SUMMARY**

The representatives from the newspaper organizations recognize the dimensions of value proposition as described by Clarke (2001), but also another dimension, here named *socialization*. Figure 2 summarizes the value proposition dimensions used to study users response based on the outcome of the analysis of the interview material.

![Figure 2. Value proposition of m-commerce according to Clarke (2001) p. 137, with the addition of socialization.](image)

**USER PERCEPTIONS OF VALUE PROPOSITION**

**BACKGROUND**

The dataset used in this analysis was based on the 1388 respondents that regularly use mobile services. In Table 3, an overview of the demographics of the respondents is presented.
As shown in Table 3, men are overrepresented in the sample. It is interesting to notice that the average age among women is lower and that the penetration of 3G phones is as high as 65.1% among the women while 25.2% among the men. To give an idea of the services the respondents have experience from they were asked what types of services they use (see Table 4).

<table>
<thead>
<tr>
<th>Service</th>
<th>No</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Downloaded ring tones</td>
<td>1430</td>
<td>39.4%</td>
</tr>
<tr>
<td>News services</td>
<td>1185</td>
<td>32.3%</td>
</tr>
<tr>
<td>Information services (phone numbers, maps etc.)</td>
<td>1120</td>
<td>30.9%</td>
</tr>
<tr>
<td>Bank services</td>
<td>688</td>
<td>19.0%</td>
</tr>
<tr>
<td>Time tables (busses, trains etc)</td>
<td>621</td>
<td>17.1%</td>
</tr>
<tr>
<td>Sports results</td>
<td>605</td>
<td>16.7%</td>
</tr>
<tr>
<td>Downloaded music</td>
<td>537</td>
<td>14.8%</td>
</tr>
<tr>
<td>Traffic information</td>
<td>512</td>
<td>14.1%</td>
</tr>
<tr>
<td>Downloaded music videos</td>
<td>231</td>
<td>6.4%</td>
</tr>
<tr>
<td>Ordering services (flowers, tickets etc)</td>
<td>178</td>
<td>4.9%</td>
</tr>
<tr>
<td>Payment of parking fee</td>
<td>174</td>
<td>4.8%</td>
</tr>
</tbody>
</table>

Table 4. Mobile services that the respondents use

As demonstrated in Table 4, downloading ring tones, news services, and information services are used by more than 30% of the respondents. To explore how the users respond to the value proposition they were asked to grade statements on a 7 grade Likert scale (1 = disagree and 7 = agree). In Table 5, the findings are summarized organized according to the five dimensions in Figure 2.
<table>
<thead>
<tr>
<th>Ubiquity</th>
<th>Mean</th>
<th>Std. dev</th>
<th>Localization</th>
<th>Mean</th>
<th>Std. dev</th>
<th>Personalization</th>
<th>Mean</th>
<th>Std. dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>U1 Access everywhere</td>
<td>6.24</td>
<td>1.13</td>
<td>L1 Locally anchored</td>
<td>4.37</td>
<td>1.62</td>
<td>P1 Adapted to personal interests</td>
<td>5.34</td>
<td>1.56</td>
</tr>
<tr>
<td>U2 Access anytime</td>
<td>5.80</td>
<td>1.37</td>
<td>L2 Location anchored</td>
<td>4.14</td>
<td>1.77</td>
<td>P2 Adapted to personal private needs</td>
<td>5.13</td>
<td>1.54</td>
</tr>
<tr>
<td>U3 Access on travel</td>
<td>4.89</td>
<td>1.87</td>
<td>L3 Position relevance</td>
<td>4.30</td>
<td>1.63</td>
<td>P3 Adapted to recreational interests</td>
<td>5.06</td>
<td>1.57</td>
</tr>
<tr>
<td>U4 Access to same services</td>
<td>4.50</td>
<td>1.74</td>
<td>L4 Personal position adaptation</td>
<td>4.06</td>
<td>1.70</td>
<td>P4 Adapted to personal work related needs</td>
<td>4.56</td>
<td>2.05</td>
</tr>
<tr>
<td>U5 Access outside home</td>
<td>3.52</td>
<td>2.15</td>
<td>L5 Adapted to time of day at the location</td>
<td>3.91</td>
<td>1.83</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Convenience</td>
<td>Mean</td>
<td>Std. dev</td>
<td>Socialization</td>
<td>Mean</td>
<td>Std. dev</td>
<td>Totals</td>
<td>Mean</td>
<td>Std. dev</td>
</tr>
<tr>
<td>C1 Provide clear overview</td>
<td>5.96</td>
<td>1.31</td>
<td>S1 Share news experience with others</td>
<td>5.21</td>
<td>1.60</td>
<td>Personalization</td>
<td>5.02</td>
<td>1.21</td>
</tr>
<tr>
<td>C2 Make my everyday easier</td>
<td>5.17</td>
<td>1.56</td>
<td>S2 Engage in dialogue with service provider</td>
<td>5.02</td>
<td>1.86</td>
<td>Ubiquity</td>
<td>4.78</td>
<td>0.85</td>
</tr>
<tr>
<td>C3 Communication utility</td>
<td>5.02</td>
<td>1.98</td>
<td>S3 Share my opinions in the media</td>
<td>4.62</td>
<td>1.87</td>
<td>Convenience</td>
<td>4.30</td>
<td>0.95</td>
</tr>
<tr>
<td>C4 Learning utility</td>
<td>4.57</td>
<td>1.95</td>
<td>S4 Brand of service provider</td>
<td>4.53</td>
<td>1.76</td>
<td>Localization</td>
<td>4.11</td>
<td>1.25</td>
</tr>
<tr>
<td>C5 Experience (e.g. surprising, exiting)</td>
<td>4.01</td>
<td>1.87</td>
<td>S5 Relation to service provider</td>
<td>3.88</td>
<td>1.77</td>
<td>Socialization</td>
<td>4.00</td>
<td>0.06</td>
</tr>
<tr>
<td>C6 Getting information first</td>
<td>3.73</td>
<td>2.07</td>
<td>S6 Content from other users</td>
<td>3.34</td>
<td>1.75</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C7 Information utility</td>
<td>3.19</td>
<td>1.91</td>
<td>S7 Contact with other users</td>
<td>3.18</td>
<td>1.76</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C8 Entertainment needs</td>
<td>3.02</td>
<td>1.91</td>
<td>S8 Contribute with content</td>
<td>3.02</td>
<td>1.96</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>S9 Community feeling</td>
<td>2.68</td>
<td>1.60</td>
</tr>
</tbody>
</table>

Table 5. Mean scores and standard deviations of items as perceived by users.
As can be seen in Table 5, many of the items score higher than the mid-point (≈4). In summation, the personalization items score the highest, followed by ubiquity. Convenience, localization and socialization score around 4 or slightly above.

In order to examine if these five dimensions are valid according to user perceptions a principle component factor analysis was conducted. Initially all items were included. The items that scored lower than 0.3 or loaded on more than one component by 0.3 or higher were eliminated in an iterative process. The final principle components analysis (varimax rotation) suggests a four-factor solution based on 16 items. This four factor solution (see Table 6) after five iterations accounted for 58% of the total variance. The sample met the necessary thresholds for conducting a factor analysis (Hair et. al., 2005), KMO Measure of Sampling Adequacy = 0.86.

<table>
<thead>
<tr>
<th>Component</th>
<th>F1</th>
<th>F2</th>
<th>F3</th>
<th>F4</th>
</tr>
</thead>
<tbody>
<tr>
<td>C7 News experience</td>
<td>0.804</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C6 Getting information first</td>
<td>0.780</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C8 Entertainment needs</td>
<td>0.760</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C5 Emotional experience</td>
<td>0.684</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S7 Contact with other users</td>
<td></td>
<td>0.818</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S9 Community feeling with other users</td>
<td></td>
<td>0.758</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S6 Content from other users</td>
<td></td>
<td>0.747</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S8 Contribute with content</td>
<td></td>
<td>0.580</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P3 Adapted to recreational interests</td>
<td></td>
<td></td>
<td>0.816</td>
<td></td>
</tr>
<tr>
<td>P2 Adapted to personal private needs</td>
<td></td>
<td></td>
<td>0.775</td>
<td></td>
</tr>
<tr>
<td>P1 Adapted to personal interests</td>
<td></td>
<td></td>
<td>0.768</td>
<td></td>
</tr>
<tr>
<td>S1 Share news experience with others</td>
<td></td>
<td></td>
<td>0.363</td>
<td></td>
</tr>
<tr>
<td>L3 Position relevance</td>
<td></td>
<td></td>
<td></td>
<td>0.801</td>
</tr>
<tr>
<td>L2 Location adapted</td>
<td></td>
<td></td>
<td></td>
<td>0.795</td>
</tr>
<tr>
<td>L5 Adapted to time of day...</td>
<td></td>
<td></td>
<td></td>
<td>0.655</td>
</tr>
<tr>
<td>L1 Locally anchored</td>
<td></td>
<td></td>
<td></td>
<td>0.457</td>
</tr>
</tbody>
</table>

Table 6. Factor solution of user’s perceptions of value proposition.

As can be seen in Table 6, the four factors correspond to four of the dimensions in the model that was tested (see Figure 2); convenience, socialization, personalization, and localization. The dimension ubiquity did not come out as a distinct factor. None of the items related to the dimension ubiquity are included in the solution. These items loaded high on all of the dimensions and were thereby eliminated.

From the localization dimension, the item of adoption to the personal position was excluded and for personalization the item of personalization to work related needs. The items C1 (provide clear overview) and C2 (make my everyday easier) loaded high on all factors indicating that these benefits are not related to one dimension. The socialization items regarding the relation to service provider loaded relatively low over all factors. The items
related to socialization with other users are the ones included in the factor solution. The outcome of this analysis is summarized in Figure 3.

As can be seen in Figure 3, the outcome of this study is that ubiquity is a general aspect of mobile services and that socialization can be added as a dimension of m-service value.

**DISCUSSION**

Mobile technology and mobile services is regarded as a new arena for profitable content offerings. To succeed with this agenda content providers need to understand how their intended value is perceived by users. This paper reports a multi method (Mingers, 2001) research study with the objective of exploring dimensions of value proposition in m-commerce. The dual approach included an interview study with staff from newspaper organizations followed by a broad survey among mobile service users in order to address both the supplier and the demand side. Value proposition is complex and difficult to communicate to the intended audience (Ostwalder and Pigneur, 2003) as there are many uncertainties of what users want (Tilson, et. al., 2004) and how they will react (Jessup and Robey, 2002). Adressing the challenge of unrevieling the uncertainties related to value proposition in m-commerce, this paper aims at contributing with an understanding from the supply side as well as the demand side (Keen and Mackintosh, 2001).

The results indicate that there are common views as well as differences between the intended value proposition and user perceptions. Drawing in the typology by Clarke (2001) this study shows that the dimensions localization and personalization are valid for the supplier as well as the demand side. Convenience was a valid dimension according to user perceptions, however the items related to “making every-day life easier” and “overview of offerings” were excluded. As these items loaded high on all dimensions and were perceived as important in regards of mean scores, it can be presumed that these items are important.
for all value dimensions. These benefits are, it would seem, related to the use situation as suggested by Mallat et al. (2006). The items of the dimension ubiquity scored high means but did not form a distinct factor. On the contrary, they loaded high on all factors. This indicates that ubiquity is not a dimension of value proposition but rather a metaphor for what is the benefit of a mobile service as such. The items related to ubiquity are what define how a mobile service distinguishes from others and thereby enables the value dimensions localization, personalization, convenience and socialization.

The dimension socialization that was identified in the analysis of the interviews proved valid also for users. Interestingly, the items related service provider relations were excluded from the socialization dimension in the factor solution, even though they scores high means. This indicates that service provider relation is important independently of value dimension and thereby highlights a difference between the service provider intentions and the user's perceptions. The items included in the socialization dimension are all related to other users or communities of users, which has not been paid very much attention in previous research. This finding is in line with the discussion by Kakihara and Sørensen (2001) in that mobility also is related to the interaction people perform and not only to their physical movements. Further, this finding is also supported in that socially oriented services such as blogs, community journalism and content sharing are gaining more and more interest from users. Users seem to value having the possibility to access these services ubiquitously at their own convenience, i.e. independently of spatial, temporal and contextual mobility.

However, even though these values are recognized by users the fact remains that adoption is very slow. One may ask if practitioners and researches are too impatient and expect too much of users. Users seem to need time to change their habits as suggested by Jessup and Robey (2002), and the relative advantages of ubiquity need to be comprehended and experienced before the value propositions can be appreciated.

**Conclusions**

In this paper perceived value of mobile services has been explored from a service provider as well as a user perspective. Summing up, the findings show that: (1) there are similarities as well as differences in perceptions of value held by service providers and users of mobile services; (2) sociability is an extra category of the value proposition not identified by Clarke; and (3) that ubiquity and service provider/user relationship are general service characteristics rather than distinct contributions to the value of a mobile service.

These findings suggest that the typology by Clarke (2001) can be reconsidered. Rather than regarding ubiquity to be a dimension of value, ubiquity can be considered as an enabler of value dimensions. In addition, the results suggest that socialization is a valid dimension of m-service value from the supplier as well as from the demand side.
Contributing to m-commerce research, this study highlights that there are common as well as differing views of value proposition between the supply side (service providers) and the demand side (users). As discussed in this paper, the understanding of value and benefits of mobile services is often related to aspects of mobility as such. These aspects are all important to mobile services. However, in order to understand how service providers and users perceive mobile service value, sociability is a value that needs more attention. We also need to recognize what the general characteristics of mobile services are and what the values that can be prescribed to individual services are. This could have significant implications and drive further adoption of m-commerce. As this study reviles the current user perceptions of value it also contributes to practice in that it helps service providers to better understand the m-service market.

There are several limitations to this study. Firstly, the selected setting for the interview study is limited to news publishing organizations and therefore they might be oriented towards some issues not representative for other content providers. Secondly, this study has not explored if there are value dimensions not yet reviled from a user perspective. As new devices and new services are entering the mobile service market, new value perceptions not previously considered might emerge.

Still, there is more to learn about what makes mobile services successful. Future research in this area could possibly investigate the sociability dimension deeper, differences between early and late adapters and attempt to revile underlying driver factors, and barriers of adoption and diffusion of mobile services to increase understanding in this area.

REFERENCES


INTERNET REFERENCES


ABSTRACT
Mobile advertising opportunities have attracted interest from industry and academics as a response to the trend of diffusion of new mobile technology. One industry particularly interested in new advertising opportunities is the newspaper industry. Many media houses envision a future multi-channel media environment supporting device independent, anytime, anywhere publishing, i.e. a Ubiquitous Media Environment (UME). In this paper we explore how ubiquitous advertising challenges the role of media houses. Ubiquitous advertising refers to advertising in a UME, anytime, anywhere and in any device. Based on results from interviews and workshops with advertisers and publishers we discuss how media houses traditional role is challenged. We contribute with an understanding of how media houses can develop their role to succeed with ubiquitous advertising and to m-advertising literature with insights into the dynamics of balancing consumer and advertiser value of ubiquitous advertising.
INTRODUCTION

The diffusion of new mobile technology, rapid growth of mobile phone penetration and the improvements of mobile device capabilities are trends that have led to an increased interest in m-advertising. The unique features of mobile devices such as their mobility, personalization, interactivity, and location awareness enable advertisers to reach consumers anytime and anywhere with targeted advertising adapted to consumers preferences and location. Indeed, this phenomenon has attracted the interest of academia as well as industry.

The interest of academic scholars has led to numerous studies of mobile marketing and advertising. Commonly, studies have been focused on the effects of mobile advertising and consumer attitudes and behavior (see e.g. Bauer et al., 2005; Heinonen and Strandvik, 2007; Läppäniemi, 2007; Merisavo et al., 2007; Okazaki, 2004; Scharl et al., 2004; Tsang, 2004). Research representing the advertiser point of view is not as common, examples are studies on m-advertising success factors (Vatanparast and Butt, 2009), mobile marketing strategy (Okazaki, 2005), challenges for ubiquitous advertising (Ihlström Eriksson and Åkesson, 2008) and factors influencing mobile advertising value from an advertiser as well as a consumer point of view (Komulainen et al., 2006; Vatanparast, 2007).

One industry that has shown special interest in m-advertising is the newspaper industry. The digitization of news media has led to the emergence of new opportunities but also to disruptive implications for traditional media (Christensen and Davis, 2006). Lately, the newspaper industry has experienced declining circulation and advertising revenues of their printed editions forcing them to seek new opportunities in digital media (The Economist, 2006). Many newspaper organizations have met this changing media landscape by organizing themselves as media houses publishing in multiple channels such as print, online, PDAs, and mobile phones. The vision is a future media environment supporting device independent, anytime, anywhere publishing, i.e. a Ubiquitous Media Environment (UME) (Åkesson and Ihlström Eriksson, 2008).

However, the digitalization of news publishing has not been trouble-free to the newspaper industry. It has been very difficult to identify business models and value networks that enable profitable online business. The same difficulty is now experienced in publishing mobile services. Now yet another mobile device, the e-reader with e-paper displays (for example the iRex iLiad or the Amazon Kindle) is introduced as a digital publishing channel. Indeed, mobile devices and wireless access to content do not only offer new opportunities but also challenges the core business of the newspaper industry. Since the revenue from advertising is the backbone of newspaper economy, there is a need to innovate advertising models in order to offer new values to advertisers and maintain a strong position on the advertising market.
The traditional business model in the newspaper industry has long been to sell content to media consumers and exposure to advertisers. In digital media, the advertising opportunities are related to getting closer to individual consumers. Thus, there are inherent risks of violating consumers’ integrity, risk of SPAM effects and irritating the consumer (Vatanparast and Butt, 2009; MMA, 2008a). Balancing these risks with advertiser values will demand that media houses develop their role in the value network. In this chapter we will address the question of how ubiquitous advertising challenges the role of media houses. We focus on the relationships between media houses, consumers and advertisers. The aim is to provide an understanding of how media houses can develop their role to succeed with ubiquitous advertising and to contribute to m-advertising literature with insights into the dynamics of balancing consumer and advertiser value of ubiquitous advertising.

BACKGROUND TO NEWSPAPER INDUSTRY AND RESEARCH SETTING

In this section we present a short background to the newspaper industries interest in m-advertising and some background statistics about the advertising market. Thereafter a presentation of the setting in which the research reported in this chapter was conducted is given. Finally, we give a brief description of the method for analyzing the material on advertising.

As described in the introduction, newspaper industry has a long tradition of selling content to an audience and selling access to this audience to advertisers. This model was not challenged until the introduction of the internet. Since then, the newspaper industry is undergoing disruptive change. Constant introduction of new digital technology, increased mobility, changing media consumption and advertising patterns, as well as digital convergence are radically changing the value networks in newspaper industry (Åkesson and Ihlström Eriksson, 2008).

This has led to a situation where the younger audience is losing interest in traditional media such as printed newspapers and is going for digital media (The Economist, 2006). Adding to this, the advertisers are following. According to the Newspaper Association of America, revenues of print advertising fell 9.4% in 2007 while online advertising revenues grew by 18.8% (NNA, 2008). Recent statistics show that newspaper advertising revenues in the US declined 16.4% in 2008 and eMarketer estimates that the online advertising revenues dropped as well with about 0.4% (eMarketer, 2008). Further eMarketer (2008) predicts that newspaper advertising in print will decline in 2009 more than any other medium, as a consequence of the economic crisis that started late 2008.

On the advertising market in digital media, newspaper industry does not have as strong position as in print. Other actors such as Google and Yahoo are strong competitors owning about 60% of the online advertising market (eMarketer, 2008). Advertisers are also communicating directly with their market with for example advanced websites, e-mail offers...
The online advertising grew with 26% in the US and 40% in Europe in 2007. The total global online advertising market was 45 billion US dollars which is 7.4% of the total advertising market. The newspaper industries share of the global market is expected to decrease from 26.5% in 2008 to 25.0% in 2011, while internet’s share is expected to increase from 10.8% to 13.8% during the same period (WAN, 2008). The m-advertising market is growing but still it is only 0.3% of the total advertising market (ZenithOptimedia, 2008). However, Gartner forecast that the mobile advertising market will grow with more than 100% per year (ZenithOptimedia, 2008).

An example of a new mobile media interesting for m-advertising recently introduced on the market is e the e-reader. The e-reader is enabled by a digital display technology called e-paper technology. E-paper technology is reflecting, giving the same reading experience as on paper (such as high contrast and the possibility to read in sunlight), and is thin, flexible and non-sensitive. The resolution is 160 dpi, which is the same resolution as on printed newspapers, compared to the 72 dpi of a LCD screen. The electronically made print also enables e-paper the same viewing angles as printed material since it is a reflecting display technology in contrast to projecting technologies such as LCD screens. Another advantage of the technology is the low power consumption; power is only needed when the display is updated. These properties makes e-paper technology especially suitable for content traditionally offered in print such as newspapers, books, magazines, making it an interesting addition to the existing channels.

Today there exist several e-readers on the market, e.g. Sony Reader, iRex iLiad, Bookeen Cybook, STaReBOOK and most recently the Amazon Kindle. Several international newspapers such as New York Times and Wall Street Journal are currently available as text versions with limited use of pictures, in some of these devices. However, the value chain in this context is in favor of the manufacturers, they own the distribution and customer base. Manufacturers like Plastic Logic, Polymer Vision and Bridgestone announces flexible, bendable and color e-paper to enter the market this year.

The research presented in this chapter has been conducted in this context in collaboration within the newspaper industry. It started in the DigiNews project, a two-year collaborative research project, including several major technology firms, media houses and universities across Europe, which ended mid-year 2006. The overall goal of the project was to explore research and development issues for an electronic newspaper of the future, including m-advertising.

After the DigiNews project ended in mid-year 2006, the research continued within the project Designing Ubiquitous Media Services (UbiMedia), which was a Swedish project with partners from 9 Swedish newspapers, the Swedish Newspaper Publishers’ Association and Stampen (a parent company for several newspapers, printing houses and distribution companies). This two-year project targeted the challenge of designing ubiquitous media services for a multitude of devices and contexts to be consumed anytime and anywhere. This is referred to as a Ubiquitous Media Environment (UME), a media environment with
integrated infrastructures, globally supported mobility and capable of distributing services seamlessly accessible independently of device.

This means that a future UME is characterized by a multitude of available media channels with different properties and capacities (see Åkesson and Ihlström Eriksson, 2008 for a more extensive description). Depending on the resources a user has available in a given context, services will be consumed in different devices and in different ways. In turn, this means that the same service will be distributed in different formats and adapted to different devices and most importantly adapted to users profile and context. Indeed, this creates new opportunities for advertising.

Within these two projects we have done interviews with newspaper management, workshops with newspaper staff working with advertising as well as with advertisers. In Table 1, an overview of data sources used in this chapter is presented.

<table>
<thead>
<tr>
<th>No. of interviews</th>
<th>No. of workshops</th>
<th>Total no. of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Publishers</td>
<td>13</td>
<td>4</td>
</tr>
<tr>
<td>Advertisers</td>
<td>2</td>
<td>5</td>
</tr>
</tbody>
</table>

Table 1. Data sources

The interview study included a total of 13 respondents from media houses and to 2 advertisers on the topic of visions of future e-newspapers, visions of UME and advertising in the future. All interviews were recorded and later transcribed. In the workshops we discussed different scenarios of future ubiquitous advertising and these scenarios were illustrated in concept movies. The data was analyzed using the themes from literature presented in the next section. Excerpts in the transcribed material were marked with assigned colors, facilitating data categorization according to corresponding themes.

**RELATED LITERATURE**

We start this section with a brief introduction to advertising in digital media. Thereafter we present a literature review of m-advertising regarding the value of m-advertising to advertisers and consumers and the associated tradeoffs when adapting m-advertising to consumers context. We will then proceed to an introduction of how the concept of context is discussed in ubiquitous computing literature. We will argue that there are several risks of context adaptation of advertising in UME. This section is concluded by a summary of the concepts from literature employed in the analysis of the empirical material.
Advertising in Digital Media

Since the internet started to be used for commercial web sites, it has become an important advertising medium with banner advertising, search advertising, online video advertising and email marketing. The values discussed for advertisers compared to advertising in traditional media are for example the interactive features, the unlimited reach in time and space, and the opportunity to reach individuals (Wind and Mahajan, 2000). Another discussed value is the possibility of providing advertisers with information and measurements of advertising effects such as reach, frequency, media impact, information that is useful for advertisers to follow up on for example sales effects (Wind and Mahajan, 2000). Already in 1996 this targeted internet advertising was labeled ubiquitous advertising by Kohda and Endo (1996).

Today, advertising in digital media has expanded to include mobile and handheld devices. The penetration of mobile phones has grown rapidly and penetration has now reached more than 60% global penetration and many countries have passed the 100% barrier according to the International Telecommunications Union (ITU, 2008). This high penetration has taken these advertising possibilities further, offering opportunities of approaching consumers even closer, most often referred to as m-advertising.

What is m-advertising and how does it differ from traditional advertising? Well, there are several concepts in literature referring to advertising in mobile digital media, for example mobile marketing, wireless advertising and mobile advertising. With the ambition to clarify the meaning of m-advertising Tähtinen (2006) performed a conceptual analysis of the terms related to mobile commercial communication in practice and research. Drawing on the general definition of advertising by Richards and Curran (2002) a paid, mediated form of communication from an identifiable source that is designed to persuade the receiver to take some action, now or in the future (p. 74), an analysis on existing terms used to describe m-advertising and m-marketing was performed. In this analysis it was found that these terms are interrelated and not distinctly used (Tähtinen, 2006). In this chapter we refer to literature using all of these terms. As a result of the analysis Tähtinen (2006) suggest that the m-advertising features that differs from traditional advertising are interactivity of the media, personal nature of mobile devices, potential customization, and its ubiquity and fastness. Thus m-advertising enables sending unique, personalized and customized advertisements engaging consumers to dialogue and transactions with the advertiser.

The Mobile Marketing Association (MMA, 2008b) has published an industry glossary with definitions of terms related to mobile marketing targeted at both industry and academia. In this glossary the definition of the term mobile advertising is: A form of advertising that is communicated to the consumer/target via a handset. This type of advertising is most commonly seen as a Mobile Web Banner (top of page), Mobile Web Poster (bottom of page banner), and full screen interstitial, which appear while a requested mobile web page is “loading”. Other forms of this type of advertising are SMS and MMS, mobile gaming ads, mobile video ads (pre, mid and post roll. (MMA, 2008a, p.21)
This definition refers to the targeted devices and the various forms of advertising rather than the potential associated with m-advertising. The potential value of m-advertising has been widely discussed in academic literature; one of the pioneers was Barnes (2002) who recognized the potential of customizing and personalizing market communication in mobile media. To advertisers examples of such values are the ability to target consumers (Salo and Tähtinen, 2005), the possibility to tailoring advertising (Komulainen et al., 2006), interactivity with consumers (Salo and Tähtinen, 2005; Bauer et al., 2005; Barnes, 2002) and increased reachability (Komulainen et al., 2006). These values build on mobile devices being a personal, always on medium, uniquely identifiable and identification of location.

Thus, to leverage these values adaptations based on context data is required. Context awareness is an important part of m-advertising (Salo and Tähtinen, 2005; Komulainen et al., 2006). However, understanding mobile context is challenging (Tamminen et al., 2004). Research addressing context information as the source of adapting mobile advertising in ubiquitous environments has addressed challenges and opportunities (see e.g. Ranganathan and Campbell, 2002; Yunos et al., 2003) and technical solutions (see e.g. Bulander et al., 2007; Kurkovsky and Harihar, 2006). In recent research conducted among experts of m-advertising, it was revealed that leveraging the potential advertiser values of m-advertising is very challenging due to consumers’ divergent contexts (Vatanparast and Butt, 2009). Adapted advertising requires context data including personal information about interests, current location, movements etc.

On the other side of these values there are a number of concerns related to using context information to adapt advertising, for example privacy concerns (Vatanparast and Butt, 2009). With the ambition to personalize advertising messages there is a risk of intrusion in consumers’ private spheres. As emphasized by Scharl et al. (2005) there is a tradeoff between personalization and privacy, and respecting consumers privacy is one key success factor for m-advertising (Vatanparast and Butt, 2009). As m-advertising targets individuals, it is perceived as personal, and could be apprehended as an intrusion of privacy. It is therefore recommended that a service provider collect consumers’ permissions (Salo and Tähtinen, 2005), which is required by law in some countries (Scharl et al., 2005). Another risk acknowledged by the Mobile Marketing Association is that m-advertising turns into SPAM, thus perceived as disturbing and unwanted by consumers. Disturbing and interruptive effects of advertising are also a risk with online advertising, these risks apply to all digital media. There are applications with different degrees of privacy on the internet as well as in mobile media. The personal e-mail inbox and the personal SMS inbox are far more private applications than internet applications, weather on PC or on the mobile.

What values are there then for consumers? Despite the concerns described above, there are also values perceived by consumers. The possibility of receiving targeted and personalized advertising (Salo and Tähtinen, 2005; Bauer et al., 2005), at the time and location when needed (Haghiri et al., 2005; Tsang et al., 2004; Bauer et al., 2005), brings value to consumers. According to MMA’s Commitment to Consumer Satisfaction there are six fundamental elements to a positive consumer experience of mobile advertising. The first is
that m-advertising should only be sent on consumers’ choice. Second, consumers should have the control over when and how they receive messages. Third, m-advertising should be customized to consumers’ interests to make content as relevant as possible. Fourth, consideration, consumers should receive or be offered something in return for accepting the m-advertising such as a discount, entry to a completion etc. Fifth, m-advertising should be constraint with responsibility, and finally confidentiality which refers to the commitment of not sharing consumer information with non-affiliated third parties (MMA, 2008b). This is in line with the findings by the online market research company Harris Interactive who found that consumers accept mobile advertising if there is a distinct value proposition, the ads are relevant, and the consumer is in control of what they get and how they are profiled (Harris Interactive, 2008).

There is some research regarding consumers’ perceptions of m-advertising. In one study it was shown that the value of m-advertising is strongly related to the content and the frequency of the advertising (Haghirian et al., 2005). In another, entertainment and information value were identified as the central acceptance drivers of mobile marketing (Bauer et al., 2005). In a study investigating the more personal spaces of mobile media such as SMS, MMS and email, showed that these mobile channels are perceived to be highly personal creating high expectations for the relevance of marketing communication messages. In addition to the importance of relevant content, the consumers’ context proved to be important, for example how and when the message is delivered (Heinonen and Strandvik, 2007).

CONTEXT ADAPTATION

A fundamental aspect of advertising in UME is adaptation to consumers’ context. In the following, we derive themes for analyzing the challenges of balancing context adaptation of m-advertising leveraging advertiser and consumer value. The conceptualization of context draws on ubiquitous computing literature and advertiser and consumer value primarily on literature on m-advertising. The aim is an analytical basis that can provide a comprehensive understanding of challenges related to adaptation of advertising in future UME. This analysis will provide insights into the dynamics of balancing consumer and advertiser value of ubiquitous advertising.

In ubiquitous computing literature, context is a central concept that can be understood as the background and specific circumstances of a subject. Context information is any information that can be used to characterize a situation such as location, identity, state of people, groups, and computing resources (Dey, 2001). In this view, context is regarded as information related to the situation in which interaction occurs. Context can also be regarded as a relational property between objects and activities (Dourish, 2004). This means that context is dynamically shaped in action rather than pre-defined and stable. Requiring and representing context information is very complex. The most commonly applied conceptualization in ubiquitous computing by Abowd and Mynatt (2000) suggest a minimum of five W’s necessary to comprehensively describe context; who, what, where,
when and why. ‘Who’ refers to the user’s identity and possibly to the identity the people in
the user’s surroundings. ‘What’ refers to the activity the user is engaged in. ‘Where’ is about
location and movements, ‘When’ about time of use, and ‘Why’ regards the use purposes.
This is the conceptualization we have adopted in this chapter.

In this chapter we are discussing ubiquitous advertising, that means advertising anytime,
anywhere, in any media, and adapted to users’ context. We refer to this as ubiquitous
advertising as it is not limited to mobile hand held devices but include all possible media
recourses in the users’ environment, stationary and mobile, in other words advertising in a
UME. A motivation for this more inclusive view is that the distinctions between mobile
devices and for example personal computers are blurring. With the advent of new mini PCs
using 3G connections, large smart phones using wifi, the same type of services and
applications available on all types of devices, and users expectations of being able to use
stationary as well as mobile devices for the same purposes. We believe that making
distinctions based on types of devices will not be as relevant when discussing the future
ubiquitous advertising. Therefore, in this framework we primarily draw on literature on m-
advertising as described above, but we adopt a more inclusive view of advertising not
limited to mobile handheld devices. In addition we draw on values of m-adverting as
discussed in m-marketing industry. In the following we summarize values discussed in
literature. This is the basis for the analysis of how ubiquitous advertising can be adapted to
context balancing consumer and advertiser values.

In Table 2, a summary of values for advertisers and consumers are presented in relation to
the concepts of context. This will serve as guidance in the analysis of the empirical material
from the projects in newspaper industry. The analysis aims at an understanding of context
adaptation of advertising content balancing user and advertiser values.

<table>
<thead>
<tr>
<th>Consumer value of m-advertising</th>
<th>Context adaptation and balancing risks</th>
<th>Advertiser value of m-advertising</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personalized offers</td>
<td>Who - is interested in and susceptible to the message/offer?</td>
<td>Targeting</td>
</tr>
<tr>
<td>Demanded advertising</td>
<td>Risk: Violation of personal integrity, security risks related to context data management</td>
<td>Willing receivers</td>
</tr>
<tr>
<td>Control over personal profile</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relevant message content</td>
<td>What – advertising content is relevant to the targeted user?</td>
<td>Message exposure</td>
</tr>
<tr>
<td>Distinct value proposition</td>
<td>Risk: Irritation over irrelevant offer</td>
<td>Interactivity</td>
</tr>
<tr>
<td>Customized to individual interest</td>
<td></td>
<td>Tracing and tracking information</td>
</tr>
<tr>
<td>Consumer control</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consumer reward</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Timely Consumer control Balanced frequency
When – is the targeted user susceptible and free enough to act on the advertisement
Reachability any-time Target at the right time
Risk: over frequency perceived as SPAM

Suitable to media Relevant to location Consumer control
Where - is the targeted user susceptible?
Reachability any-where Location based Target at the right location
Risk: wrong location perceived as intrusive

Fit with individual media goals Entertainment and information value
Why – does the advertising content match the consumer's intent?
Tailoring and customizing advertising
Risk: advertising perceived as non useful

Table 2. M-advertising values, balancing risks and context concepts

ADVERTISING IN UBIQUITOUS MEDIA ENVIRONMENTS

In this section we provide the publishers and advertisers reflections of adapting ubiquitous advertising to consumer context. We relate these thoughts to the themes derived in the literature review aiming at an understanding of challenges associated with context adaptations of ubiquitous advertising balancing user and advertiser values.

WHO – THE IDENTITY
The most fundamental aspect of ubiquitous advertising is the opportunities to reach individuals and thereby come much closer to consumers (see e.g. Barnes, 2002; Salo and Tähtinen, 2005). However, to truly target individuals it is necessary to identify individuals rather than devices. When advertising in for example mobile phone, this is done by identifying a device and a mobile phone subscription. However, to leverage the potential values of ubiquitous advertising individuals need to be identifiable independently of media and device as illustrated with this quote:

You cannot focus on a device to reach your target group. If you want to reach teenagers during the Idol show, you must advertise online in their social community. As soon as the TV commercial starts they go online to discuss the show with their friends. During the TV commercial break you might reach their parents. (Advertiser)

Consumers would then be targeted cross-media and throughout their media day anytime and anywhere. Being targeted with personalized advertising that is relevant is one of the fundamental values from the consumer point of view (Salo and Tähtinen, 2005; Bauer et al., 2005). On the other hand this means that consumers are targetable all the time and everywhere and it is important to respect the integrity of consumers and to make sure that
the consumer is in control of the flow of advertising (Vatanparat and Butt, 2009; Scharl et al., 2005; MMA, 2008a). According to this quote this is challenging to advertisers:

The most irritating advertisements are those that are not targeted, that is mass marketing and SPAM. Of course, it’s not fun to receive ads from Via and Pampers if you aren’t interested. We as advertiser are so trained at thinking in mass-media, I mean that if we reach as many as possible some of them will be interested an most of them not. We will not be able to restrict the targeting enough. We are too inhibited when it comes to advertising. (Advertiser)

This implies that there really is a need for a balancing role if the consumers in a UME are to be willing receivers of advertising (MMA, 2008b) and thus more receptive to the advertising messages. The publishers recognize that this can be accomplished if the consumer is in control of their personal profile as shown by Harris Interactive (2008).

We have to develop our ability to target. This is what we can sell to advertisers in the future. If we can define relevant target groups based on knowledge about the consumers and as a result reach the right people with the right advertising and provide the means for interaction between consumers and advertisers, we have really added new value to advertising. (Publisher)

The communication with consumers would then be far more personal and interactive than in traditional advertising.

WHAT – THE ACTIVITY
Information about consumer activities could be used to adapt advertising content. In traditional advertising the message is general to a wide audience, whereas in ubiquitous advertising the relevance of messages could be increased by adapting advertising to consumer actions (Vatanparat and Butt, 2009). Advertising content and format could be personalized to add value according to activities. For example, while cooking, recipes could be offered together with ads about food, kitchen utilities, kitchens, dining furniture, but not about drilling machines. Another example is illustrated by this quote form a newspaper publisher:

Your washing machine is broken. I start searching for washing machines, get some consumer tests together with advertising offers. I connect directly with the advertiser with the most attractive offer, place an order and the next day I have the washing machine delivered. (Publisher)

It is all about reaching people at the right moment and in the right mood. This means that the advertising would be adapted to consumers’ actual situation. Targeting on a situation, like when you are looking for a house to buy is a well working model. Everybody wanting to
buy or sell a house is interested. However, even if consumers try to avoid the advertising not perceived as relevant, some advertisers will try to push through anyway.

Nobody can avoid advertising. Then we only say: how are we going to reach this customer in another way? The company will talk to the consumers anyway. We will have to find other ways. Sure, we can try to sort and control as a consumer, but Pampers will not give up on parents of small children just because they have rejected advertising. (Advertiser)

Traditional advertising models are not selective enough since it also reaches people that are not interested. This could be an important part of the media house role in a UME.

WHERE – THE POSITION
One of the most common context concepts discussed is making use of position to customize advertising, for example location based advertising (see e.g. Haghirian et al., 2005; Tsang et al., 2004; Bauer et al., 2005). This might be even more interesting to consumers while on travel as this advertiser is visualizing.

Think to get a last minute ticket offer to a musical when you are in New York. That would be cool. Yes, if I have given my permission. But I don’t want them to know that I’m in New York. (Advertiser)

Another aspect of consumer position is increased reachability for advertising, to reach the consumers wherever they are. This fact also brings a risk of over exposing consumers with advertising and thereby causes irritation.

It is a delicate balance between advertising and disturbance, between surprise and irritation. If people are irritated they think SPAM – that does not work. (Publisher)

A mediating role coordinating advertising could help overcome this negative effect. Based on consumers individual acceptance level advertising could be channeled to consumers at the right location. The advertising format could be adapted to fit the location, for example the advertising message might be silent on the bus but maybe audio in the car. In traditional advertising in for example print newspapers, the audience in a specific area such as a town or a region is reached. In ubiquitous advertising it would be possible to reach the consumers independently of location.

WHEN – THE TIME
Based on context information, the best possible time to deliver advertising can be determined. Such context information may be based on time of day the consumers schedule etc (see e.g. Haghirian et al., 2005; Salo and Tähtinen, 2005). One aspect of timing is adapting advertising to time of day, so called day-parting. For example, ads about lunch
menus are not very interesting after 2 pm. Relevance is not only to target a specific time of
day but also about holidays and vacation times, so called seasoning. Relevant information
about the consumer could be used to customize offers according to for example Christmas,
Ramadan, Mother’s Day etc. However the right time can also be related to a situation, for
example when the consumer is searching for something as this quote shows.

That is the Google model, when the user is there, when they are searching for something,
and not when we think they want it. That is to say it is on the user’s terms. That is really
timing! (Publisher)

The back side of these opportunities is if consumers perceive the frequency of advertising to
be interruptive as demonstrated by this quote.

If it is the right time too often consumers will not accept advertising. We must learn from
TV viewers’ behavior. (Advertiser)

In traditional advertising messages are exposed to an audience during a specific time-slot,
such as a specific day in a morning paper or at a specific time in TV. Ubiquitous advertising
could offer opportunities to present advertising messages in real time when users are
interested.

WHY – THE PURPOSE
Adapting advertising to fit with consumer use purposes and needs is probably one of the
most challenging (Vatanparast and Butt, 2009). Discover consumer intent and to match the
message with the consumer use purpose is very complex. Search based advertising is the
model that comes the closest to this adaptation, but still how do you know why a consumer
is searching for something?

Search based advertising is very interesting but how do you really know why somebody is
searching for something based on one word. If I type the word sun in the search engine, I
could be looking for tomorrow’s weather, for a charter trip to the sun or maybe I am
searching for Sun Microsystems. (Advertiser)

To manage the fit between consumer goals and advertising offers, detailed information of
consumer preferences is required to support advanced interpretations of consumer media
behavior. Furthermore, there must be a process of requesting or prioritizing advertising
without predefined criteria. This is very challenging for media houses to achieve.

Maybe this could be a possibility if we can coordinate our efforts between the
newspapers. In the future we will see more behavioral advertising. What you do decides
what ads you get. (Publisher)
Thus, ubiquitous advertising could add value by supporting consumers use purposes, what the individual is trying to achieve, in contrast to the traditional model of exposure.

**SUMMARY**

As shown true targeting of individuals with ubiquitous advertising rely on information about the consumer about all five context concepts. In Figure 1, a summary of how ubiquitous advertising differs from traditional advertising is summarized.

![Figure 1. Ubiquitous advertising related to traditional advertising](image)

These differences will have implications for media house strategies. While the advertising and pricing models of today largely build on traditional advertising as described above, media houses have to rethink and reorganize in order to be able to expand their value offers to advertisers with ubiquitous advertising integrating all their channels as recognized by this respondent.

*We are very bad at using the strengths from each channel the best way and combine them for best effect. We should be able to use the fact that we have many channels as a huge advantage. But we do not do that today.*

In addition, to be able to attract advertisers, new models for tracing and tracking advertising impact are needed as illustrated by this quote.

*We really need to develop our methods for how to measure to produce targeting and tracing information. We really need to develop such techniques for the future. This is really a huge challenge and maybe the most important one because then we can communicate what we are selling to the advertisers.*
The publishers and advertisers that participated in interviews and workshops reported in this chapter recognize that for ubiquitous advertising to be successful, content, format and distribution of advertising need to be adapted to be accepted and appreciated by consumers. For media houses to take a role in accomplishing consumer value of advertising with context adaptations they have to rethink their relationships to advertisers and consumers. Their business would be much more relational and closer to individuals, in other words, a shift from mass-media to relational media. In the following we will discuss a scenario of the media house role in a UME and the associated challenges.

**MEDIA HOUSE ROLE IN UBIQUITOUS MEDIA ENVIRONMENTS**

To develop a role in UME that can balance advertiser and consumer value, media houses must be able to communicate the capability of handling context data. The media house role must vouch for individual integrity. Towards advertisers media houses need to offer a serious and trustworthy media environment. To be trustworthy, the supporting platform needs to be stable, secure and capable of intelligent and dynamic service and advertisement distribution.

Further, the opportunities of ubiquitous advertising adapted to consumer context also means that new values can be offered to advertiser customers. Apart from exposure, reach, coverage, targeting, and interactivity close relationship building can be offered in a serious and trustworthy media environment. In addition, a UME platform could offer new possibilities for detailed feedback to advertiser customers based on tracking and tracing data on how users react and act on advertising. Further, a UME offers possibilities of integrating relevant advertising in services, adding to service values. In other words, new possibilities for advertisers to contribute to and co-create consumer service value by supporting their use purposes are opened. In Figure 2, the future role of media houses balancing consumer and advertiser values in UME is illustrated.
However, to develop the role as outlined in Figure 2, a UME needs to be built on an interorganizational cross-media platform. A platform supporting a UME would apart from supporting a wide variety of mobile devices such as mobile phones, iPods, e-readers and other resources such as displays, wireless data access etc, be highly dependent on context information as described earlier. In our scenario of the media houses role in UME, this context data would be collected and managed by media houses. Context data together with the ability to identify individuals independently of device are hence the core resources in a UME. In turn, this is dependent on the ability to identify individuals. In light of the above we can establish that there are a number of challenges that media houses need to address in order to develop their role in UME.

**Challenge 1 - Context adaptation:** In what ways can advertising be integrated with services/content adjusted to context adding to consumer relevance?

Managing context data challenges the role of media houses dramatically compared to the role they have in traditional media. Adapting services and advertising to context information is of course very complex. It requires integration between systems such as publishing systems and advertising systems in and between organizations, and integrated technologies for intelligent and dynamic context adaptations. It would also require a very sensitive approach to consumer reactions to advertising adjusted to context.
Challenge 2 - Real-time advertising adjustment (and channeling) to consumer behavior and preferences: How to adjust advertising to consumer preferences, i.e. advertising on consumer terms?

Media houses would have to balance the interests of advertisers with user's integrity and preferences. Not only are there different acceptance levels for advertising in different media channels and different advertising formats, but also different acceptance levels between different situations and between individuals. These aspects are also part of the adaptations that need to be made of advertising. When advertising is integrated with editorial content in new ways this challenges the relationship between users, advertisers and media houses. For media houses to keep the respectability in their relations it is of utmost importance to develop models to balance advertising on user terms.

Challenge 3 - Dynamic data exploitation: How to develop models to produce and make use of consumer information dynamically over time in a ubiquitous media environment vouching for integrity and security.

Advertising in a UME requires huge amounts of data need to be managed in real-time. In addition, data need to be stored and managed to customize services as well as to analyze user behavior. In turn, this requires advanced integrity and security capabilities. This means that media houses would have to strengthen their relationships and build stronger value networks among themselves.

Challenge 4 - Consumer-advertiser relations: How to create an arena for building relations between users, users and advertisers as well as between advertisers?

A UME needs to support a very high level of interactivity. When advertising becomes more interactive and relationship building, there is also a need for structures to uphold relationships over time. Relationships might also be between consumers and between advertisers. If consumers can build communities as consumers within the media environment they can also communicate with advertisers in more powerful and influencing ways. Further, advertisers can be more adaptive to consumers and build relationships to create joint offers. Further, media houses can host interactive consumer forums with many different but related firms offering support to consumer needs. Thus media houses role is far more relational and would require new competences.

Challenge 5 - Advertising business models: How to develop business models that leverage advertiser value in ubiquitous media environments.

Ubiquitous advertising would demand totally new business models. In traditional advertising, the revenue models are built on selling a space and place or a time-slot to expose an advertising message to users. In a UME this would be impossible. New revenue models might instead be based on actual targeting effects, user reactions and actions or even on actual impact of for example sales. In addition, the business offers would include
production of advertising content to a larger extent than today. Further, detailed feed-back and analysis of advertising and market analysis are new business opportunities for media houses to offer advertising customers.

**CONCLUDING REMARKS**

In this chapter we have addressed the question of how ubiquitous advertising challenges the role of media houses in UME. We did this by deriving themes from a literature review as guidance for interpreting publisher and advertiser reflections and ideas about future advertising. By this analysis we have established that the media house needs to be extensively developed to leverage the values of ubiquitous advertising.

When new mobile media enter the media market this does not only challenge media houses to innovate services but defiantly also compel a need to innovate advertising offers. As we have shown, the need for innovating advertising is as important as exploring new services to media consumers. This is not limited to the efforts of publishing an e-newspaper, the need for innovating advertising is related to all channels integrated in a UME. Making use of the opportunities offered in a UME and pursuing a development towards ubiquitous advertising might be one path to innovate traditional newspaper media.

However, this development is not only challenging to media houses in general, it also challenges the existing value networks in the newspaper industry. Leveraging the values of ubiquitous advertising would expand the relationships and exchanges between media houses and advertisers. Further, to be able to leverage the advertiser values, the relationships between media houses would change to a more open network, exchanging knowledge, technical solutions and customer relationships. A single media house is not capable of building the platforms required, an interorganizational effort is needed. Whether the newspaper industry with its long tradition is capable of this change is still to be seen.

The development towards UME is not limited to the newspaper industry. The concepts described in this chapter are applicable to other industries, content providers and distributors of services. One example is the mobile service market in telecom infrastructure offering services to mobile phones. In this chapter we have discussed ubiquitous advertising challenges from a media house perspective, suggesting the media house as a suitable and trustworthy host for the context information needed in a UME. However, similar visions have been produced by for example DoCoMo and Nokia. There is no question about the digitalization towards ubiquitous advertising, it will become a reality in due time, in one form or another. The question is who is going to take the role of being the spider in the value network.
REFERENCES


ABSTRACT
This article presents the consumer view of an innovative m-service, that is, the e-newspaper, which is published for a mobile reading device equipped with an e-paper display. The research question of this article is: What are the implications of the consumer view of future m-service innovation on business models? In this article, we present empirical results from an online survey with 3,626 respondents representing the consumer view. The factor analysis revealed three aspects of consumer preferences, that is, Ubiquitous access, Prestige of news source and Local anchorage and advertising. These were then correlated with media behavior and e-newspaper preferences to indicate three possible market segments. We then discuss the implications that these consumer views could have on developing new business models, followed by a comparison to earlier research. Finally, we propose an integrated e-newspaper business model framework consisting of three models, ubiquitous, local, and prestige.

INTRODUCTION

Today, the market for mobile e-services (m-services) has expanded in a wide range of areas, including the newspaper industry. There are two ongoing trends that influence the newspaper industry and related m-service initiatives.

First, the media industry is converging and boundaries between different media domains are blurring (Fidler, 1997). For example, newspapers have become media houses, offering content and services in multiple channels such as the Web, radio, mobile phones, PDAs, and TV (Åkesson and Ihlström, 2006a). Companies often merge their businesses with free newspapers (Chan, 2004). Second, the newspaper industry faces structural change due to declining subscription and advertising revenues as well as new competition from companies attracting advertisers to digital channels, for example, Google and Yahoo. This is forcing the newspaper industry to explore new revenue opportunities (The Economist, 2006).

M-services have attracted growing interest from the industry over the last couple of years due largely to the high penetration of mobile phones and the possibility of reaching new and younger audiences (The Swedish Newspaper Publishers’ Association, 2007; IFRA 2006). The mobile phone penetration in the UK, Sweden and Italy already passed 110% in 2006 (Wallace, 2006), as teenagers and young adults in Sweden are in general more frequent mobile users than elderly (Westlund, 2006).

In Japan, the mobile channel has been the most common point of access to online services for years (Ratcliff, 2002). However, the adoption of m-services has not taken off as expected in Europe (Hammond, 2001; Carlsson et al., 2006). A growing body of research into m-services and m-commerce has sought to understand the reasons for this disappointing development (Amit and Zott, 2001; Pedersen et al., 2002; Samtini et al., 2003; Sarker and Wells, 2003; Vrechopoulos et al., 2003; Constantinou et al., 2005; Mallat et al., 2006). Among the explanations are business model related factors, usability factors and technological factors.

The newspaper industry has experienced problems finding successful business models for mobile content, mainly due to the revenue split with mobile operators, the difficulty of attracting advertisers and the low adoption rate of m-services among readers (Ihlström, 2005). Moreover, it has been challenging to offer a quality news reading experience on small screens. However, a technological innovation, e-paper technology (further described in section 2), has the potential of offering a quality news reading experience because this technology gives the same reading experience as on print. Incorporated in a mobile reading device, e-paper has the potential of revolutionizing the m-service market for this industry, with its core business of the “written word,” but the challenge of finding suitable business models remains. If planned carefully, the e-newspaper introduction could also address the challenges of revenue splitting and attract advertisers in new and innovative ways.
In addressing this challenge, we present empirically the consumer views on this particular future m-service. The core research question of this article is: What are the implications of the consumer view of future m-service innovation on business models?

The purpose of this article is twofold, theoretical and practical. The first objective is to contribute to existing literature on business models for m-services by illustrating the consumer view on a possible future m-service innovation. The second objective is to provide knowledge useful for the content providers to develop business models for the introduction of the e-newspaper.

The article is structured as follows; section 2 outlines the importance of e-newspapers, followed by the theory used in section 3. The methodology and data collection is presented in section 4, and the consumer view is presented in section 5. Section 6 discusses the findings and concludes the article.

THE IMPORTANCE OF E-NEWSPAPERS

An e-newspaper is a newspaper m-service published in a mobile reading device with an e-paper display. The e-newspaper should not be confused with electronic newspapers offered online, such as PDF versions of newspapers, which are digital replicas of the printed edition in 72 dpi resolution.

E-paper technology is reflecting, giving the same reading experience as on paper (such as high contrast and the possibility to read in sunlight), and is thin, flexible and nonsensitive. The resolution is 160 dpi, which is the same resolution as on printed newspapers, compared to the 72 dpi of a LCD screen. The electronically made print also enables e-paper the same viewing angles as printed material because it is a reflecting display technology in contrast to projecting technologies such as LCD screens. Another advantage of the technology is the low power consumption; power is only needed when the display is updated. Taken together, these properties make e-paper technology especially suitable for content traditionally offered in print such as newspapers, books, and magazines.

There are three e-paper based products that is, eReaders, on the market today, iRex iLiad with an 8.1” screen (iRex Technologies, 2006), Sony Reader with a 6.9” screen (Sony Styles, 2007), and Amazon Kindle with a 6” screen (Amazon, 2008), which makes them highly mobile but also allows larger presentation space than mobile phones and PDAs. E-paper technology is developing rapidly and many are investing in “plastic electronics” (E Ink corporation, 2007; Polymer Vision, 2007), which is predicted to become a multimillion dollar industry (Plastic Logic, 2007).
The optimal future e-newspaper combines the portability, readability and overview from the printed newspaper with the possibilities of online media such as constant updates, interactivity and video, offering a high quality news reading experience anytime and anywhere (Ihlström, Åkesson, and Nordqvist, 2004). However, at this point some of the most essential attributes like color, multimedia and interactivity are not supported in the available eReaders. At this moment, due to the fact that these devices do not support GSM, 3G or HSDPA, they do not support updated news anytime and anywhere if there is no WLAN coverage.

De TIJD, a Belgian financial newspaper, made a test trial publishing an e-newspaper on the iRex iLiad in the spring of 2006 (The Editors Weblog, 2006a) followed by a test trial with an e-newspaper from Sundsvalls Tidning in Sweden (Ihlström Eriksson and Svensson, 2007). Yantai Media Group started to publish e-newspapers on iRex iLiads in China during 2006 (iRex Technologies, 2006) and in May 2007 the French daily economic paper Les Echos started to print their e-newspaper (The Editors Weblog, 2006b). More recently, New York Times, Wall Street Journal, Washington Post and Le Monde among others, have started to publish on the Amazon Kindle (Amazon, 2008). In Figure 1, an e-newspaper from Sundsvalls Tidning is presented in the iRex iLiad.

The European project, DigiNews (ITEA 03015), was a 2-year project including partners from Belgium, Spain, Netherlands, France and Sweden, including several major technology firms, media houses and universities. Several studies regarding e-newspapers have been conducted by DigiNews. The overall goal of this project was to explore research and development issues regarding technology, design and business models for the future e-newspaper. The DigiNews project ended in June 2006, but this line of research has continued within a project called Designing Ubiquitous Media Services through Action Research (UbiMedia), which is a Swedish project with partners from nine Swedish newspapers, the Swedish Newspaper Publishers’ Association and Stampen. This 2-year project targets the challenge of designing ubiquitous media services for a multitude of devices and contexts to be consumed anytime and anywhere. The survey from which results are presented in this article was conducted as a joint activity between the two projects. In the following we refer to publications within these two projects.

Figure 1. An example of an e-newspaper in an iRex iLiad
The e-newspaper concept has attracted the interest of the newspaper industry mainly because of the print quality and readability. Publishing news on e-paper raises hopes in the newspaper industry as a future replacement of print, which would heavily reduce production and distribution cost while preserving the qualities of news reading. Another reason for their interest is the possibilities of expanding the market reach, for example reaching subscribers located far away (Ihlström, 2005). Moreover, due to the possibility of uniquely identifying each e-paper device to the database that handles the distribution and subscription, it is possible to target individuals with advertising, which in turn could attract more advertisers (Ihlström Eriksson et al, 2007).

The newspaper industry has for centuries built its business on selling news to consumers and exposure to advertisers. In this business model, the newspaper companies have control over production, distribution and customer relations. As the introduction of the e-newspaper involves both new technology and new content at the same time, the introduction involves multiple stakeholders in the value chain. Besides content providers, consumers and advertisers, device producers and infrastructure providers need to be involved. Due to the unique readability, the eReaders have the potential of becoming “the iPod of reading,” including content like books, manuals, maps, magazines, newspapers and personal documents, bringing together several content providers as well.

To test the e-newspaper concept, three e-newspaper prototypes (Figure 2) were developed within the DigiNews project in collaboration with three newspaper partners, that is, Aftonbladet, Göteborgs-Posten and Sundsvalls Tidning (Åkesson and Ihlström, 2006b; Ihlström Eriksson and Svensson, 2007). These prototypes were also presented in conjunction to the questionnaire used in this study (see section 4).

![Figure 2. E-newspaper prototypes](image_url)

The newspapers are prepared to take a more aggressive role in the e-newspaper introduction to avoid the competition from other stakeholders, such as mobile operators,
(Ihlström, 2005). As stated in the introduction, the challenge of finding initial business models still remains. In order to address this challenge, the content provider views of potential business models for the e-newspaper introduction have been studied (Ihlström Eriksson and Kalling, 2007), but in this article we focus on the consumer view and how their preferences can be of use for content providers in developing business models, and compare the results with the content provider view.

**THEORY**

In this study the business model construct has been used to capture the consumer view of the future e-newspaper. The business model concept is used by practitioners as well as academics. It has been discussed as a substitute for strategy (e.g., Normann, 1977; McGrath and MacMillan, 2000; Normann, 1977; Schumpeter, 1934), and, more importantly has been used to discuss electronic business strategies (e.g., Amit and Zott, 2000; Rappa, 2002; Timmers, 1998).

We have chosen to use Hedman and Kalling’s (2002, 2003) generic business model construct, which is based on established business strategy theory. This business model construct suggest that business models include six causally related firm-internal and firm-external components. Internally, firms consist of resources (e.g., Barney, 1991; Peteraf, 1993) which are activated and organized (e.g., Porter, 1985) to generate offerings (Porter, 1980). This requires interaction with the factor market (e.g., Barney, 1986; Porter, 1991; Wernerfelt, 1984), and, of course, that customers (Porter, 1980) are made to prefer the offering over those of competitors (Porter, 1980). Figure 3 depicts the construct. The construct can be used for the analysis of the relation between a business and its environment as well as between internal factors. It has a causal logic linking input factors through its conversion into offerings demanded at profitable levels in relation to competing offerings. It provides plausible explanations to firm performance variation and competitive advantage. Below we discuss the business model components and link these to current literature on e-news services offered online.
Customers

Customers put pressure on suppliers to increase the quality/price ratio (Porter, 1980), and understanding customers includes segmentation and individual customer knowledge in terms of preferences, price sensitivity, demographics, quality requirements, switching costs, locations, market position, and so on. Within online media, readers and advertisers are the most central customers (Clemons et al., 2002; Walter and Stolarova-Ornek, 2001), although here we concentrate on readers. Within research, the focus is on lock-in aspects (Sääksjärvi and Santonen, 2003), niche-marketing possibilities (Krueger et al., 2004) and the tendency to demand commoditized media products for free (Chyi, 2002).

Competition

Features of competition that make a difference and need be understood generically include scale and size, product range, cost structure, customer relations, competencies, value chain configurations, organization structure, locations, barriers to entry/exit, switching costs, and growth rate. Yet competition has received scarce attention in online media literature. Clemons et al. (2002) claim advertising has low barriers to entry whereas news has higher barriers due to credibility and reputation gained over years of news publishing. Punie et al. (2001) anticipate increasing consolidation in the sector, due the fragmentation of actors.

Offering

Any offering has a cost and a price, and tangible and intangible features that customers compare with those of competitors. Understanding customer needs and the features of the offering is central to perceived quality and uniqueness. Online offering aspects are well covered in current literature (e.g., Chyi. 2002; Punie et al., 2002; van der Beek et al., 2005;
Ihlström and Henfridsson, 2005). Online news is frequently free, and alternative sources of revenue include differentiating certain news for price-flexible customers, loyalty programs, and advertising. Personalization, archiving and versioning become important (Ihlström and Palmer, 2002). With respect to features, online media must consider content, advertisements, design, branding, and complementary products, in addition to several technical challenges. Screens, batteries, security, usability, technology ownership, hardware and software stability, speed and capacity are important factors in the functionality of mobile services (Tsalgatidou and Pitoura, 2001).

Organization and activities
A value-chain analysis includes sequences of activities, links to outside stakeholders and between internal activities, as well as structure and means of control. In addition, it requires an analysis of drivers of cost and differentiation. Possible metrics include productivity, effectiveness, and perceived quality of output. In the literature on online media, the organization of activities is typically assumed to resemble a traditional newspaper. Clemons et al. (2002) say it is principally about creating, producing, and authenticating news and that confidence is a central feature of online news providers. Furthermore, advertising will become more important, given that it is not the typical core competence of newspapers.

Resources and factor Market interaction
Competencies, brands, image, and proprietary technology are typical firm resources. Resources that matter are valuable but also unique, and analyzing under which circumstances they are valuable and unique is imperative. This includes how individual resources are activated and organized and how this links to critical features of the offering. Resources also need to be acquired and sourced cost-effectively on the factor market. In online media literature, strong customer and advertiser relations are highlighted (Walter and Stolarova-Ornek, 2001), as are reputation, brand name and advertising (Clemons et al., 2002). Reputation and recognition are important (because readers can turn anywhere to find news) and often characterized by time compression diseconomy (Dierickx and Cool, 1989).

In a recent study, this business model construct (Figure 3) was applied to address content provider views on possible business models for the e-newspaper introduction (Ihlström Eriksson and Kalling, 2007). This study was based on interviews and workshops with newspaper representatives. The empirical findings revealed 16 factors as the most important aspects when the e-newspaper market is being established.

Four typical business models (Figure 4) were suggested based on the input side of news distribution, that is, the degree of bundling, and the output side, that is, geographical coverage. This four business models are: The Interpress News Agent, International Newspaper, Local Newspaper and Community Micronews. The “International Newspaper” refers to the global actor who provides its own news, without bundling news from multiple sources. An example here includes the New York Times and companies with a global brand.
name and fully controlled editorial workflows. The “Interpress Newsagent” has a global coverage yet sources its content from a wide array of local providers. The “Community Micronews” actor has a very strong local approach, and covers local news in great detail, using a community journalism approach, not necessarily using their own journalists. The “Local Newspaper” resembles very much the ordinary local, regional or national newspapers of today.

Based on these four typical business models (Figure 4), a business model framework was suggested to represent the content provider view for the e-newspaper introduction (Table 1).

Figure 4. Four typical business models
The business model framework includes the 16 empirically identified aspects, as well as business model components for all four typical business models, that are relevant in a discussion of e-newspaper strategies from a content provider view. This earlier work suggests that the business model construct (Hedman and Kalling, 2002, 2003) is applicable to e-services, such as mobile e-news services.
In addressing consumer views on mobile e-services we have chosen to conduct a Web-based survey. This was done in the spring of 2006 at three Swedish online newspapers. The Swedish market is characterized by high newspaper readership (Lund, 2007) and high penetration of mobile phones (Wallace, 2006) suitable for a survey on a future innovative mobile e-news service. We choose to use online questionnaires because that allowed us to provide information for the respondents to obtain an understanding of the e-newspaper concept. Because we assumed that the e-newspaper concept was not known to most of the potential respondents we provided them with the possibilities to:

- read more about e-paper technology,
- watch three concept videos (see below), and
- explore the e-newspaper prototype of the newspaper in question (see below).

In nonprobability sampling there is a risk that the sample does not accurately represent the population. In the case of voluntary sampling, the sample tends to be overrepresented by individuals who have strong opinions. However, surveys on the Internet, as in other approaches, are limited by the willingness of the respondents to answer the questionnaire. Ritter et al. (2004) made a comparative study using Internet vs. mailed questionnaires and argue that: “among a convenience sample recruited via the Internet, results from those randomly assigned to Internet participation were at least as good as, if not better than, among those assigned mailed questionnaires, with less recruitment effort required. The instruments administered via the Internet appear to be reliable and to be answered similarly to the way they are answered when they are administered via traditional mailed paper questionnaires.” Furthermore, Buchanan and Smith (1999) argue that Web samples can be as representative as traditionally collected samples because of the heterogeneity of the online population.

Admittedly there are inherent problems in controlling who responds to online questionnaires. Control for cases with multiple submissions from the same IP number was handled in the data collection. Furthermore, the respondents that had given an age under 15, those who did not complete or answered the questions included in this study inconsistently were excluded from the data set. We are aware that we might have captured an audience that is more interested in media or technology than the average consumer as the questionnaire was placed on newspaper sites and regarded new technology as well as being a voluntary sample. On the other hand, it would not have been possible in this early stage of development to receive the preferences of a larger sample of consumers, without the properties of the Internet as we needed to show the prototypes and concept videos (discussed below) in order for the respondents to understand the concept of an e-newspaper.
We presented the questionnaires at the news sites of the three Swedish newspapers that we have collaborated with in developing e-newspaper prototypes (Figure 2), that is, Aftonbladet, Göteborgs-Posten and Sundsvalls Tidning. Aftonbladet is a tabloid with the most visited news site in Sweden, Göteborgs-Posten is a regional morning paper covering Göteborg (the second largest city in Sweden) and its surroundings, and Sundsvalls Tidning is a local morning paper in the north of Sweden.

Three short concept movies of future e-newspaper use were developed to further illustrate the potential of the e-newspaper. These movies were created in collaboration with SVID Stiftelsen Svensk Industridesign, the design company Propeller AB and the Swedish Newspaper Publishers’ Association. The movies envisioned the benefit of the e-newspaper for three different personas: the business woman, the student and the senior citizen. Close-ups on the designed user interface together with examples of functions showed the future newspaper in detail. The scenarios were based on preferences articulated by respondents in workshops and interviews and showed how a future e-newspaper could support the media consumption of the three personas in different contexts. These movies were presented to the respondents to further illustrate the e-newspaper concept.

Three approaches for presenting the questionnaire were used in our study, a) a newspaper article explaining the e-newspaper concept at Aftonbladet’s www.aftonbladet.se, b) a banner ad at Göteborgs-Posten’s www.gp.se, and c) a pop-up window at Sundsvalls Tidning’s www.st.nu.

a. In conjunction to the article at the site, links to the three concept videos and to the Aftonbladet e-newspaper prototype was presented. There was also a written invitation to participate in the questionnaire presented together with a link to the starting page of the questionnaire. The article was placed on the front page of www.aftonbladet.se on April 7th (11:23 AM) and was moved to the IT section on April 10th and was removed on April 11th (5:00 PM). At www.aftonbladet.se, 3757 respondents answered the questionnaire.

b. The banner read “Do you want to influence the future e-newspaper? Click here!” Clicking the banner directed the visitor to the starting page of the questionnaire. The banner was placed on www.gp.se between April 7th (10:23 AM) to April 12th (07:54 AM).

c. A full size pop-up window was presented each time a visitor entered the front page at www.st.nu between April 7th (12:10 AM) to April 12th (09:15 AM) resulting in 447 respondents. The pop-up window contained the starting page of the questionnaire.

In total, 4339 respondents answered the questionnaire (Table 2). After reducing the sample by removing inconsistencies and so forth, as discussed above, the dataset used in the analysis contained 3626 respondents. In Table 3, an overview of the demographics of the respondents is presented.
As can be seen in Table 3, there are more men than women and the average age of men is slightly higher. Most of the respondents are in the medium income segment, have secondary or university education, and work full time or study.

<table>
<thead>
<tr>
<th>Respondents</th>
<th>All</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>No of respondents</td>
<td>3626</td>
<td>2216</td>
<td>1410</td>
</tr>
<tr>
<td>Age range</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-86</td>
<td>1088</td>
<td>561</td>
<td>527</td>
</tr>
<tr>
<td>15-79</td>
<td>1520</td>
<td>853</td>
<td>667</td>
</tr>
<tr>
<td>15-68</td>
<td>1018</td>
<td>802</td>
<td>216</td>
</tr>
<tr>
<td>Average age</td>
<td>37,1</td>
<td>38,0</td>
<td>35,8</td>
</tr>
<tr>
<td>Std. dev</td>
<td>13,8</td>
<td>14,4</td>
<td>12,7</td>
</tr>
<tr>
<td>Income level</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>low</td>
<td>1088</td>
<td>561</td>
<td>527</td>
</tr>
<tr>
<td>medium</td>
<td>1520</td>
<td>853</td>
<td>667</td>
</tr>
<tr>
<td>high</td>
<td>1018</td>
<td>802</td>
<td>216</td>
</tr>
<tr>
<td>Education (54 missing)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>elementary</td>
<td>331</td>
<td>212</td>
<td>119</td>
</tr>
<tr>
<td>secondary</td>
<td>1646</td>
<td>1002</td>
<td>644</td>
</tr>
<tr>
<td>university</td>
<td>1595</td>
<td>975</td>
<td>620</td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>full time</td>
<td>1995</td>
<td>1353</td>
<td>642</td>
</tr>
<tr>
<td>part time</td>
<td>281</td>
<td>107</td>
<td>174</td>
</tr>
<tr>
<td>unemployed</td>
<td>210</td>
<td>115</td>
<td>95</td>
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<tr>
<td>retired</td>
<td>227</td>
<td>164</td>
<td>63</td>
</tr>
<tr>
<td>student</td>
<td>688</td>
<td>387</td>
<td>301</td>
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<tr>
<td>sick leave</td>
<td>132</td>
<td>50</td>
<td>82</td>
</tr>
<tr>
<td>other</td>
<td>93</td>
<td>40</td>
<td>53</td>
</tr>
<tr>
<td>constitution</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>total</td>
<td>3626</td>
<td>2216</td>
<td>1410</td>
</tr>
</tbody>
</table>

Table 3. Demographics of respondents

The questionnaire was divided in four different parts, 127 questions in total. The first part contained 20 background questions. The second part consisted of 39 questions regarding business models for media services, the third part 26 questions about media behavior and e-newspaper preferences, and finally, the fourth part 41 questions concerning mobile services. Many of the questions where of multiple choice and several open questions were included as well. In this article we report from part one, two and three.

The empirical ambition of this study is to track key concerns and considerations for media consumers with regard to e-newspaper business models. This includes, naturally, the objective of identifying patterns of preference and behavior, groups of factors that explain consumption of the offerings of e-newspaper suppliers, and possible ways to link these
factors to optional strategies and business models, all with the ambition to say something empirically and theoretically informed about the emerging e-newspaper industry.

- **Background questions (part one):** The background questions included questions of demographic nature (5), media consumption (3), technology use (5) and the use of mobile services (7). In this paper only the demographic questions are used, that is, gender, age, occupation, education and income level.

- **Business model questions (part two):** Our questions to users were designed in a way that enabled respondents to signal the importance of matters related to the different components of e-newspaper business models. Respondents were asked to indicate, by means of 1-7 Likert scale questions, the importance of certain features related to preferences, e-newspaper offerings, competing offerings, organization and activities, and resources. The questions were also designed to enable particular consideration of geographical coverage and degree of bundling (see Ihlström Eriksson and Kalling, 2007). Because there is relatively little written on e-newspapers, and even less using the five components of the business model construct, we operationalized the model partly openly and inductively, partly by reference to our past experience and knowledge of the e-newspaper business, and partly based on relevant indicators as proposed by Hedman and Kalling (2002).

The questions on “customers” were to capture consumer behavior, priorities and preferences with regards to the functionality offered (Hedman and Kalling, 2002). Q25, Q28, Q38, and Q52 are examples of questions related to these general aspects. Lock-in aspects (see Sääksjärvi and Santonen, 2003) are covered by Q34, Q49, and Q58. Niche-marketing possibilities (e.g., Krueger et al., 2004) are operationalized by Q33 and Q47. The demand for more commoditized media products (see Chyi, 2002) is tested through Q22 and Q32.

“Competition” questions are aimed here at understanding how readers view alternative offerings. Relatively little has been written on competition in the electronic news sector, and so the questions are based on general considerations of competing offerings in a fragmented sector (e.g., Punie et al., 2001), and particularly if and how competing alternatives can be integrated. The local vs. national vs. international dimensions (Ihlström Eriksson and Kalling, 2007) are covered by Q33, Q51 and Q59. Q23 and Q29 relate to the view on integrating competing offerings.

The “offering” questions are meant to indicate price sensitivity and the actual functionalities and quality properties that customers are interested in (Hedman and Kalling, 2002). Pricing (e.g., Ihlström and Palmer, 2002) is captured in Q27 and Q49. The importance of brand and confidence is covered in Q56, the real-time access preference in Q24 and Q43, the local vs. world news priorities in Q53, and finally the preference for electronic vs. physical papers in Q40 (see Chyi, 2002; Punie et al., 2002).

Looking at “activities and organization,” this business model component is meant to cover aspects related to the infrastructure of e-newspaper supply. We have looked in particular at
the timing dimension of news reporting (e.g., Clemons et al., 2002), operationalized in Q36, Q50, Q54 and Q55; and also in to the view on the importance and relevance of networking externally outside the media house itself. Q45 and Q48 indicate how readers view their own role in news reporting (e.g., community journalism) and how they rate the interaction with advertisers.

Finally, the “resources and factor market interaction” questions aim at describing readers’ view on the requirements on assets and their management (Kalling and Hedman, 2002). Customer relations, including the ability to show local and international news (Q30, Q35, Q37) and the ability to interact and make use of advertising (Q26 and Q46) are covered (see Walter and Stolarova-Ornek, 2001), as are the importance of credibility and recognition, particularly brands, journalists and editors, authenticity and swiftness (Q42, Q41, Q21, Q44 and Q57) (see also Clemons et al., 2002).

Media behavior and e-newspaper preference questions (part three): Of the 26 questions in part three, six regarded general e-newspaper preferences, based on earlier research (Ihlström et al., 2004; Ihlström, Svensson, and Åkesson, 2005, Åkesson and Ihlström, 2006b). In the correlation analysis in this article we use three of these (Q61, Q64 and Q67), that used a 7-grade Likert scale. Part two of the questionnaire also included four questions (Q62, Q63, Q68 and Q69) about acceptance of the e-newspaper concept as described in this study. These questions were given fixed options for answers. The questions regarding e-newspaper preferences could be found in Appendix B. The remaining 20 questions concerned media behavior.

To research media behavior, we first constructed questions that regarded the social and interactive nature of the media (Q70-71). Seven questions (Q73-79) were adopted and adjusted from the Technology Readiness Index (Parasuraman, 2000). We then looked at the need for news and focused on the different character of news items. Q80 refers to the attention creation mechanisms used by media companies (Fredberg, 2003), Q81 serves as an indicator of the extent to which readers prioritize localness or simple headline news (as is the business of content aggregators such as Yahoo News). Media markets are becoming increasingly differentiated where the local nature of news (geographic or topical) becomes increasingly important (Fredberg, 2003), and Q82-83 refers to the tendency of readers to seek value such news. The last two questions relate to the relation between the different media outlets of a news organization and aims at creating an understanding of readers’ opinion about the integration/competition between outlets. The questions used in the analysis of this article are presented in Appendix C.

The responses to the questionnaire were analyzed using SPSS v14.0. To analyze the structure of the interrelationships among the variables in part two we conducted an exploratory factor analysis. The sample met the necessary thresholds for conducting a factor analysis (Hair et al., 2005), KMO Measure of Sampling Adequacy = 0.88. We used principal component factor analysis with principal component extraction method and Varimax rotation method. After 5 rotations that accounted for 44% of the variance, this
analysis resulted in a set of three factors representing common underlying dimensions of the consumers media consumption patterns and preferences. To examine if these three dimensions are related to different consumer profiles we compared them against background factors such as age, level of education and income. This analysis focused on calculation of mean scores for each background factor, and the mean differences were examined with ANOVA analysis (Hair et al., 2005). Thereafter, we correlated these three factors to the questions about media behavior and preferences of a future e-newspaper. Thereby, we could relate the consumer’s perceptions of what is attractive for a future e-newspaper to the dimensions of business models.

**CONSUMER VIEWS ON MOBILE E-NEWS SERVICES**

In this section we present the data and analysis from the survey among newspaper consumers. First, the result of the factor analysis of the business models questions is outlined and second, the mean scores of the factors between different groups of respondents based on demographics are compared. Finally, the correlations between the factors and the question about preferences for a future e-newspaper and media behavior are presented.

**FACTOR ANALYSIS: QUESTIONS ABOUT FUTURE MOBILE E-NEWS SERVICES**

In order to examine the consumer view on future mobile e-news services, to inform the development of business models, we performed a principal component factor analysis on the questions in Appendix A. Initially all items were included and in an iterative process the items that scored lower than 0,3 or loaded on more than one component by 0,3 or higher were eliminated from the solution. For sample sizes 350 and larger the significance level for a factor loading is 0,30 or above (Hair et al., 1995). In the factor analysis 11 items with low factor loadings (>0,3) or cross-factor loadings were eliminated to ensure the factors to be unidimensional and distinct. The final principal components factor analysis (varimax rotation) suggests a three-factor solution (see Table 4) based on 28 items that after five iterations accounted for 44% of the total variance.
The three-factor solution presented in Table 4 gives three consumers views on mobile e-news services. The items in the first factor are related to how consumers access news content and to the independence of time and place. We have labeled this factor **Ubiquitous access** (1). The items forming the second factor concern the brand and the resources related to the news source and we have labeled this factor **Prestige of news source** (2). Finally, the third factor is related to items referring to local anchorage and advertising, thereby labeled **Local anchorage and advertising** (3). These three factors can be considered to be three viewpoints on mobile e-news services from a consumer perspective that inform the construction of business models for the introduction of the e-newspaper.
To compare the three viewpoints against consumer demographics we split the dataset into the different categories given by the background questions. We calculated the mean score for each of the three factors (from a seven grade scale) in relation to each of the demographic categories. Differences of mean scores were tested using ANOVA analysis. The results are presented in Table 5.

<table>
<thead>
<tr>
<th>Factor</th>
<th>Ubiquitous access</th>
<th>Std dev</th>
<th>Prestige of news source</th>
<th>Std dev</th>
<th>Local anchorage and advertising</th>
<th>Std dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>4,7</td>
<td>1,1</td>
<td>4,1</td>
<td>1,5</td>
<td>3,3</td>
<td>1,2</td>
</tr>
<tr>
<td>Women</td>
<td>4,5</td>
<td>1,1</td>
<td>3,9</td>
<td>1,4</td>
<td>3,6</td>
<td>1,2</td>
</tr>
<tr>
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<td>12,436/0,000</td>
<td>33,193/0,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-29</td>
<td>4,6</td>
<td>1,1</td>
<td>3,8</td>
<td>1,4</td>
<td>3,3</td>
<td>1,1</td>
</tr>
<tr>
<td>30-44</td>
<td>4,8</td>
<td>1,1</td>
<td>4,0</td>
<td>1,5</td>
<td>3,5</td>
<td>1,2</td>
</tr>
<tr>
<td>45-59</td>
<td>4,5</td>
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<td>4,1</td>
<td>1,5</td>
<td>3,5</td>
<td>1,3</td>
</tr>
<tr>
<td>60-</td>
<td>4,6</td>
<td>1,1</td>
<td>4,7</td>
<td>1,4</td>
<td>3,6</td>
<td>1,2</td>
</tr>
<tr>
<td>ANOVA F/sig</td>
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<td>2,074/0,000</td>
<td>1,336/0,037</td>
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<tr>
<td>Income level</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>low</td>
<td>4,6</td>
<td>1,1</td>
<td>3,9</td>
<td>1,4</td>
<td>3,4</td>
<td>1,1</td>
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<tr>
<td>medium</td>
<td>4,7</td>
<td>1,1</td>
<td>4,0</td>
<td>1,4</td>
<td>3,5</td>
<td>1,2</td>
</tr>
<tr>
<td>high</td>
<td>4,9</td>
<td>1,2</td>
<td>4,3</td>
<td>1,5</td>
<td>3,4</td>
<td>1,2</td>
</tr>
<tr>
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<td>8,095/0,000</td>
<td>1,709/0,163</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education (54 missing)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>elementary</td>
<td>4,5</td>
<td>1,2</td>
<td>3,9</td>
<td>1,5</td>
<td>3,6</td>
<td>1,3</td>
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<td>secondary</td>
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<td>1,1</td>
<td>3,9</td>
<td>1,4</td>
<td>3,5</td>
<td>1,3</td>
</tr>
<tr>
<td>university</td>
<td>4,7</td>
<td>1,1</td>
<td>4,1</td>
<td>1,4</td>
<td>3,3</td>
<td>1,2</td>
</tr>
<tr>
<td>ANOVA F/sig</td>
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<td>11,517/0,000</td>
<td>16,978/0,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>full time</td>
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<td>1,1</td>
<td>4,0</td>
<td>1,4</td>
<td>3,4</td>
<td>1,2</td>
</tr>
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<td>part time</td>
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<td>1,2</td>
<td>3,9</td>
<td>1,5</td>
<td>3,4</td>
<td>1,2</td>
</tr>
<tr>
<td>unemployed</td>
<td>4,6</td>
<td>1,1</td>
<td>3,9</td>
<td>1,5</td>
<td>3,4</td>
<td>1,1</td>
</tr>
<tr>
<td>retired</td>
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<td>1,2</td>
<td>4,6</td>
<td>1,4</td>
<td>3,7</td>
<td>1,2</td>
</tr>
<tr>
<td>student</td>
<td>4,6</td>
<td>1,0</td>
<td>3,8</td>
<td>1,3</td>
<td>3,3</td>
<td>1,1</td>
</tr>
<tr>
<td>sick leave</td>
<td>4,5</td>
<td>1,2</td>
<td>3,9</td>
<td>1,6</td>
<td>3,5</td>
<td>1,3</td>
</tr>
<tr>
<td>other</td>
<td>4,6</td>
<td>1,2</td>
<td>3,8</td>
<td>1,4</td>
<td>3,4</td>
<td>1,3</td>
</tr>
<tr>
<td>ANOVA F/sig</td>
<td>1,491/0,177</td>
<td>9,003/0,000</td>
<td>3,270/0,003</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 5.** Mean scores of the three factors per demographic category

As demonstrated in Table 5, the mean score differences are significant (p<0,05) with the exception of Ubiquitous access/Occupation and Local anchorage and advertising/Income level.
There are some interesting differences to be noted. *Ubiquitous access* and *Prestige of news source* are rated higher by men than women while women rate *Local anchorage and advertising* higher. The age group that rate *Ubiquitous access* the highest is 30-44, and the ones that rate *Prestige of news source* and *Local anchorage and advertising* is 60+. The age group 15-29 generally rate *Prestige of news source* and *Local anchorage and advertising* lower. *Ubiquitous access* and *Prestige of news source* are rated slightly higher by the higher educational and income level whereas *Local anchorage and advertising* is about the same for all income levels. Noticeable is that the higher educational level, the lower rating for *Local anchorage and advertising*. As a final point, *Ubiquitous access* and *Prestige of news source* are rated somewhat higher by full time occupied respondents whereas *Local anchorage and advertising* is rated higher by retired respondents.

**Correlation against E-newspaper and Media Behavior Questions**

The three factors representing consumer viewpoints were correlated against the questions about how consumers would prefer a future e-newspaper. The correlation coefficients are presented in Table 6.

<table>
<thead>
<tr>
<th>Q no</th>
<th>Preferences for a future e-newspaper (Alternatives on 7-grade Likert scale)</th>
<th>Correlation coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>61</td>
<td><em>What reasons are critical for you to exchange the traditional newspaper to the e-newspaper in the future?</em></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Environmental reasons, i.e. you are concerned about future environment</td>
<td>0.204** 0.026 0.068**</td>
</tr>
<tr>
<td>B</td>
<td>Cost savings, i.e. you see economical advantages for the exchange</td>
<td>0.323** -0.007 0.046*</td>
</tr>
<tr>
<td>C</td>
<td>Time savings, e.g. you do not have to go to a news stand to buy the newspaper</td>
<td>0.418** -0.029 -0.015 *</td>
</tr>
<tr>
<td>D</td>
<td>Accessibility, i.e. the newspaper is accessible where ever I am in the world</td>
<td>0.419** 0.022 0.014</td>
</tr>
<tr>
<td>E</td>
<td>Satisfaction, e.g. satisfy interest in new technology</td>
<td>0.428** 0.037* 0.029</td>
</tr>
<tr>
<td>F</td>
<td>Added value, i.e. the new technology offers new services that the traditional newspaper does not</td>
<td>0.444** 0.056** 0.044*</td>
</tr>
<tr>
<td>64</td>
<td><em>Apart from reading the news, what added services do you think should be available in a future e-newspaper?</em></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Personalization, e.g. possibility to choose the parts of the content that you are willing to pay for</td>
<td>0.163** -0.019 -0.015</td>
</tr>
<tr>
<td>B</td>
<td>Community information, e.g. time tables, maps, traffic information</td>
<td>0.156** -0.003 0.003</td>
</tr>
<tr>
<td>C</td>
<td>Personal information, e.g. phone book, schedule</td>
<td>0.177** -0.021 0.010</td>
</tr>
<tr>
<td>D</td>
<td>Common information, e.g. dictionaries, manuals</td>
<td>0.172** 0.022 0.002</td>
</tr>
</tbody>
</table>
How important are the following attributes/factors for you choosing to read your newspaper on e-paper?

<table>
<thead>
<tr>
<th></th>
<th>The appearance of the e-paper and its contents</th>
<th>The news are constantly updated</th>
<th>Offer of additional functions such as chat, motion pictures, interactivity</th>
<th>Ease of use and ease of learning</th>
<th>Trust in technology performance</th>
<th>Observation of people in my surrounding using the technology</th>
<th>Positive effect on the environment e.g. less paper production and tree fell</th>
<th>Importance of take part in new technology</th>
<th>Ease of finding what I am looking for/wish to read</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>0,129**</td>
<td>0,077**</td>
<td>-0,021</td>
<td>0,197**</td>
<td>0,001</td>
<td>0,031</td>
<td>0,099**</td>
<td>0,249**</td>
<td>0,145**</td>
</tr>
<tr>
<td>B</td>
<td>0,182**</td>
<td>0,015</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<td>D</td>
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<td>I</td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

* Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed).

Table 6. Correlations between the three viewpoints and e-newspaper preferences

The three factors/viewpoints were then correlated against the questions asked about their media behavior. The correlation coefficients are presented in Table 7.
I am often asked for advice about new technology, **0.222**, **0.021**, **-0.64**

I prefer simple technology to advanced functionality, **-0.23**, **0.042**, **0.011**

According to my opinion it is safe to use credit cards for payment on the Internet, **0.165**, **0.004**, **-0.091**

It worries me that other people can see what information I send on the Internet, **-0.006**, **0.019**, **0.020**

I have a desire to check for updates on the online newspapers I read, **0.293**, **0.030**, **-0.035**

I benefit from reading news on sites that summarize news, e.g. Yahoo News, **0.225**, **-0.007**, **-0.049**

My online newspapers address local issues and debates that are of importance to me, **0.164**, **0.031**, **0.052**

My online newspapers address topics that are of importance for my leisure interests, **0.157**, **0.029**, **-0.004**

I follow the same topics and news online as I do in other media, **0.155**, **0.041**, **-0.037**

It irritates me if I find the same article in the printed newspaper as in the online newspaper, **0.047**, **0.042**, **0.003**

**Table 7.** Correlations between the three viewpoints and media behavior

As indicated by the statistics in Table 6 and Table 7, there is a pattern of how newspaper preferences and media behavior correlate to the three viewpoints of future mobile e-news services. These patterns will be discussed below. In the factor analysis, Ubiquitous access centered around the notion of being able to access news (including international news) ubiquitously. In correspondence, the correlation patterns related to Ubiquitous access segment centre upon five groups of features: all possible functionality (Q 61, 64, 67), networking (Q 70, 71), advanced use of media and technology (Q 73-76, 78), constant updates and relevance (Q 80, 82, 83), and portal consumption (Q 81, 84, 85).

The Prestige of news source rests on questions related to well-known and recognized media brands, editors, journalists and news sources. The correlation patterns include preferences partly similar to those of the Ubiquitous access and Local anchorage and advertising segments: new and advanced technology (Q61E, 67A, 67H, 73, 74, 75, 77) is important (cf. the Ubiquitous access segment), while the perception that the e-newspaper is seen as a differentiated e-news service (Q 61F, 84, 85) resembles the preferences of the Local anchorage and advertising patterns.

The Local anchorage and advertising viewpoint emphasizes factors related to local news and local advertisements. The analysis also revealed that this viewpoint correlates to four groups of features: low degree of use of media and technology (Q 73, 75, 76, 78), differentiated media (Q 61F, 81, 84) where the e-newspaper should add value in relation to the paper version, basics only (Q 61A, 61B, 64H, 64F) meaning e-newspaper features such as environmental
friendliness and cost-effectiveness are important, and passive character (Q 67B, 67F, 70). We have summarized the features correlating to the three viewpoints in Table 8.

<table>
<thead>
<tr>
<th>Ubiquitous access</th>
<th>Prestige of news source</th>
<th>Local anchorage and advertising</th>
</tr>
</thead>
<tbody>
<tr>
<td>all possible functionality</td>
<td>new and advanced technology</td>
<td>low degree of use of media and technology</td>
</tr>
<tr>
<td>networking</td>
<td>differentiated e-news service</td>
<td>differentiated media</td>
</tr>
<tr>
<td>advanced use of media and technology</td>
<td>basics only</td>
<td></td>
</tr>
<tr>
<td>constant updates and relevance</td>
<td>passive character</td>
<td></td>
</tr>
<tr>
<td>portal consumption</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 8. Summarized features of the different viewpoints

As indicated by these statistics, we suggested that the market for the e-newspaper is a segmented market. There are three emergent segments; the Ubiquitous access segment, Prestige of news source segment, and the Local anchorage and advertising segment. All of these segments have certain features (see Table 8), that can be used to describe the preferences and consumption behavior of these segments. Finally, to examine the consumer’s acceptance of the concept of an e-newspapers four questions were asked concerning accepted cost level, the financing of an e-paper device, their willingness to exchange the printed newspaper to an e-newspaper in the future, and finally, within which timeframe they would consider exchanging. The results are presented in Table 9.

<table>
<thead>
<tr>
<th>Question and alternatives</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
</tr>
<tr>
<td>What cost level is acceptable for you to change to an e-newspaper?</td>
<td></td>
</tr>
<tr>
<td>Cheaper than the traditional printed newspaper</td>
<td>2119</td>
</tr>
<tr>
<td>Same price</td>
<td>371</td>
</tr>
<tr>
<td>Can be more expensive if there is added value</td>
<td>281</td>
</tr>
<tr>
<td>Price is unessential</td>
<td>171</td>
</tr>
<tr>
<td>Missing</td>
<td>684</td>
</tr>
<tr>
<td>Total</td>
<td>3626</td>
</tr>
<tr>
<td>How do you think the e-paper device should be financed/paid for?</td>
<td></td>
</tr>
<tr>
<td>Hire-purchase</td>
<td>281</td>
</tr>
<tr>
<td>Buy the device</td>
<td>711</td>
</tr>
<tr>
<td>Included in subscription</td>
<td>1708</td>
</tr>
<tr>
<td>Other</td>
<td>592</td>
</tr>
<tr>
<td>Missing</td>
<td>334</td>
</tr>
<tr>
<td>Total</td>
<td>3626</td>
</tr>
</tbody>
</table>
Would you consider to, sometime in the future, exchange your traditional printed newspaper for the e-newspaper?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>67,1</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>2431</td>
<td>67,1</td>
</tr>
<tr>
<td>Missing</td>
<td>1070</td>
<td>29,5</td>
</tr>
<tr>
<td>Total</td>
<td>3626</td>
<td>100</td>
</tr>
</tbody>
</table>

Within which time frame are you ready to read your newspaper on e-paper?

<table>
<thead>
<tr>
<th></th>
<th>Today</th>
<th>Within 5 years</th>
<th>Within 10 years</th>
<th>Within 20 years</th>
<th>Never</th>
<th>Missing</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1521</td>
<td>683</td>
<td>209</td>
<td>88</td>
<td>223</td>
<td>902</td>
<td>3626</td>
</tr>
<tr>
<td></td>
<td>41,9</td>
<td>18,8</td>
<td>5,8</td>
<td>2,4</td>
<td>6,2</td>
<td>24,8</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 9. Consumer acceptance of an e-newspaper

As can be seen in Table 9, the majority of consumers expect an e-newspaper to be cheaper than the traditional printed newspaper and prefer the device to be included in the subscription. As many as 67.1% would consider exchanging the printed newspaper for an e-newspaper and the majority are willing to do so today or within 5 years. This indicates that there is an acceptance among consumers for the concept of an e-newspaper as described in this study.

**DISCUSSION AND CONCLUSION**

In this article we have addressed the challenge of finding suitable business models for future innovative m-services, in this case the e-newspaper, by empirically illustrating the consumer view of such an innovation. We have done so by conducting a broad survey analyzed by a) a factor analysis of consumer views on an innovative e-news service, b) comparing the results with demographics, and c) correlating against media preferences and behavior. The analysis revealed three consumer views, that is, *Ubiquitous access, Prestige of news source* and *Local anchorage and advertising*. Further, the analysis indicates that these three viewpoints represent three possible market segments. These insights provide useful knowledge to content providers when developing initial business models. In the following we discuss the practical implications of addressing the research question of *what are the implications of the consumer view on a future mobile m-service innovation to initial business models*. Thereafter, we discuss how these findings add to the literature on business models for m-services.

The findings have some practical implications for content providers to develop initial business models for the e-newspaper. The results from this article can inform management in their efforts to target market segments. As shown by the comparison to demographic background data, the differences between different demographic groups regarding their
viewpoints on future mobile e-news services are not very large but, with few exceptions, they proved to be significant. Together with the patterns given by the correlations to preferences and media behavior, this study outlines possible strategies for market segmentation. The results from the factor analysis challenge the present notion of suitable business models held by content providers (Ihlström Eriksson and Kalling, 2007). While content providers notions form four different business models, that is, The Interpress News Agent, International Newspaper, Local Newspaper, and Community Micronews, the consumer viewpoint centers around three factors, that is, Ubiquitous access, Prestige of news source and Local anchorage and advertising. In the following, we will discuss the three possible market segments and how they relate to the content provider views on business models for the e-newspaper introduction.

Taken together, we argue that the three possible segments can be described as two main positions Ubiquitous access and Local anchorage and advertising with Prestige of news source as a mixture of properties from both. In other words, we argue that the Ubiquitous access segment expects a high degree of ubiquity of media, news and communication and interaction, prefers more or less any new possible feature that follows with the e-newspaper, uses the latest technology, prefers all news in one place (one integrator preferably), and who probably will not read paper versions in the future. In sharp contrast, the Local anchorage and advertising segment representative is not as interested in technology, networking, or the ubiquity of news and media, but rather sees the e-newspaper as a complement to the paper version, and who typically appreciates a strong local character with regard to advertisements and news content. Sharing preferences with both, the Prestige of news source segment is yet more aware and updated consumers, anxious to be part of the world of media and news. They are interested in new technology but also prefer their media sources to be well-known and trustworthy, and recognition appears important. Like the Local anchorage and advertising segment, they still see the e-newspaper as a complement to the paper version.

In comparison to the business model options suggested by Ihlström Eriksson and Kalling (2007), we suggest that the Ubiquitous access segment is probably best served by the Interpress News Agent business model. The Interpress News Agent business model includes customer preferences such as “news anytime, anywhere” customers and a multiplicity of sources, and it includes offering components such as low prices, “news wholesale” product scope, up-to-date world news and standard (nonbranded) e-reader devices. Furthermore, the activities of this business model include 24/7 operations, provider relations and differentiated advertising. Among resources required by the business model are source reach, global and local media brands, advertising networks, and to be perceived as a recognized wholesaler. This business model appears to fit hand in glove the preferences and consumer patterns of the Ubiquitous access segment.

Likewise, we think the Prestige of news source segment fits the International Newspaper business model (Ihlström Eriksson and Kalling, 2007), which includes brand aware customers concerned about the credibility and image of the media provider. The price model of the offering addresses the need to charge for news, which appears plausible for this segment.
The offering is also based on prestigious and branded devices and updated world news. Activities include 24/7 service, and global advertisement sourcing, and resources required are well-recognized journalists perceived as serious, and a global brand name.

The Local anchorage and advertising segment is probably well served by both the Community Micronews and the Local Newspaper business models. The question is whether it is important that the provider has a “local wholesaler” strategy with multiple sources or an “inhouse production” strategy. If this local customer is able to appreciate community journalism, is only interested in extremely local news and ads, and does not care too much about branded media and prestigious devices, then the Community Micronews model that probably suits the segment best. If customers are more tied to their local newspaper and media provider, and if they can accept a slightly higher price, then it might be the Local Newspaper model that fits the segment better.

As highlighted by the discussion above, the business model framework suggested for the content provider view corresponds to the three possible market segments suggested in this article. We therefore suggest a new integrated business model framework consisting of three models, that is, ubiquitous, local and prestige (Table 10), that could be helpful to content providers when developing business models for the introduction of the e-newspaper. The implications of these three models are further discussed below.

<table>
<thead>
<tr>
<th></th>
<th>The Ubiquitous Model</th>
<th>The Local Model</th>
<th>The Prestige Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customers</td>
<td>“Anytime, anywhere”; multiple sources and portal consumption; price sensitivity; all functionality; networking</td>
<td>Local interest; “basics only”; paper and e-paper seen as complements</td>
<td>New and advanced technology; e-newspaper a differentiated media; image awareness; global brand recognition</td>
</tr>
<tr>
<td>Competition</td>
<td>Bundling; distribution network; and low costs</td>
<td>Local papers and e-papers; ownership; outsource or insource?</td>
<td>Global news sources and media houses; distribution ownership; brand versus “wholesale” strategies</td>
</tr>
<tr>
<td>Offering</td>
<td>Price pressure; advertising price premium; “wholesale”; standard devices</td>
<td>Informative, local news and advertisement; regular and few updates of news; lower price sensitivity</td>
<td>Informative; global news and advertisements; 24/7 updated news; lower price sensitivity; prestigious and branded devices</td>
</tr>
<tr>
<td>Activities and organization</td>
<td>24/7, provider relations; sourcing to be prominent; umbrella trading and differentiated advertising</td>
<td>Local relations to advertisers; local journalists; possibly community journalism; distribution ownership</td>
<td>24/7 service; in-house journalists; distribution ownership; global advertisement sourcing</td>
</tr>
</tbody>
</table>
The possibilities and future potential for these business models vary, but the primary speculation is that the **ubiquitous model** will need to run a cost-effective operation and, at the same time, be able to source news and ads from all over the world. Infrastructure will become central, as will marketing in order to be perceived as trustworthy. Perhaps the most important tactic is to become the e-newspaper quickly in order to set standards and develop customer groups. It is likely, we believe, that this business model, more than the others, is subject to increasing returns, network externalities and first-mover advantages (see Amit and Zott, 2001). Cheaper standard devices, possibly distributed for free or included in the subscription, could be a way for this strategy to be implemented. But it must be complemented by a commitment to adjust the technology as the market matures.

Furthermore, the **local model** might face challenges due to technological development. The strong feelings for local news and advertisers will be matched by the global and international scope of news and advertising, but also lower prices, more frequent updates, and more. A device such as the eReader may not be able to compete with the physical paper unless its functionality is used to the maximum, including news and ads sourced from other places than the local town, and more frequent updates. Possibly, this business model will last as long as there are readers primarily interested in local matters.

The **Prestige model** has one central feature that will impact the opportunities, and that is the ability and will of customers to pay. How long this preference persists is another question. Crucial here is carefully nurturing of the brand, including potentially expensive things such as promoting trustworthiness, including journalists, authenticity, in-house productions, global networks of advertisers, marketing and more. One central task is to manage the internal infrastructure, which is bound to be global. There will be constant discussions about being “bureaucratic,” and the question of insourcing vs. outsourcing will probably surface frequently. For e-newsreaders, this business model is likely to include expensive and branded devices.

Adding to the literature on business models for m-services, we present this integrated framework including content provider as well as consumer views on m-services. This framework may serve as guidelines for future introductions of an e-newspaper, but may also be of guidance to other types of m-service content. As of yet, no major market analysis with the e-newspaper have been done, and it is therefore difficult to foresee patterns of usage, or where, when and how the e-newspaper will be used. More research is needed to understand in depth the possible role of the e-newspaper in people’s lives and in relation to
other media forms such as the Internet, the printed newspaper, television and already existing electronic mobile media. Also, there are several questions regarding the functionality of e-newspapers that remain unanswered. The preferences of the segments identified here may perhaps serve as guides for such functionality.

To conclude, the e-newspaper innovation attracts interest among the consumers. Two thirds of the consumers in our study are willing to read their newspaper on e-paper today or within 5 years. Matching this consumer interest with the content providers’ hopes for the e-newspaper, we believe that the e-newspaper introduction in Sweden is not far away, making it an important issue to consider at the managerial level. We believe that the practical implications based on the proposed integrated business model framework could be helpful for newspaper management when developing initial business models for this introduction. The article also contributes to existing literature on business models for m-services by creating a further understanding of customer preferences in this market and by further developing the conclusions one may draw of these preferences. Although this research has been conducted with consumers in the newspaper industry, we believe that the concept of these models is relevant to other m-services as well. Further research will address the advertiser view, also relevant in building business models for mobile news services. The proposed integrated business model framework must also be empirically validated, both in Sweden and internationally.

ACKNOWLEDGEMENT

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REFERENCES


APPENDIX A

Q no. Customers
32 I want access to news all day
34 It is important that the news source is well known
38 I am primarily interested in local news
52 I am primarily interested in national news
28 I am primarily interested in international news
58 My primary source of news is the morning paper
22 I read the news on the Internet every day
25 I want access to news also when I am travelling or commuting to work
47 Newspaper ads are an important source of information to me
33 I prefer local advertisements to national
49 I have strong confidence in my local paper

Competition
59 I prefer local newspapers to national
51 I read foreign papers on the Internet
29 My demands for news is not satisfied by one individual paper
23 I would appreciate it if several papers could share one portal/website
33 I combine local papers with national or foreign

Offering
56 For me, the brand of the paper is important
43 I must have access to news in real time
53 World news are more important than local news
24 I want access to several news sources simultaneously
27 I do not pay for electronic news
29 I am happy to pay for technical equipment giving me access to news (e.g. computers, Internet connection)
40 Within a few years I will not read the physical paper regularly

Activities and organization
54 It is of outmost importance that I have access to news instantly.
36 I am active informing paper editors about news
45 My paper or my news sources must have their own editorial board and journalists
50 I expect my paper to be more active in reporting news
55 My news source must update its news several times every day
48 I want to be able to communicate with the companies that advertise in my paper

Resources and factor market interaction
42 My paper must have well known journalists and editors
41 The brand of the news source is important
21 The credibility of papers is more important than the content
44 My news source must be well known
30 My news source must have access to world news
37 My news source must be able to provide local news fast
46 I find the advertisements in my paper useful
35 My paper must be able to offer all world news and local news simultaneously
26 I want to be able to interact more with journalists and editors (e.g. to ask questions)
57 News authenticity is more important than swiftness
APPENDIX B

Q no.
61 What reasons are critical for you to exchange the traditional newspaper to the e-newspaper in the future?
   A Environmental reasons, i.e. you are concerned about future environment
   B Cost savings, i.e. you see economical advantages for the exchange
   C Time savings, e.g. you do not have to go to a news stand to buy the newspaper
   D Accessibility, i.e. the newspaper is accessible where ever I am in the world
   E Satisfaction, e.g. satisfy interest in new technology
   F Added value, i.e. the new technology offers new services that the traditional newspaper
does not

62 What cost level is acceptable to you to change to an e-newspaper?
   A Cheaper than the traditional printed newspaper
   B Same price
   C Can be more expensive if there is added value
   D Price is unessential

63 How do you think the e-paper device should be financed/ paid for?
   A Hire-purchase
   B Buy the device
   C Included in subscription
   D Other

64 Apart from reading the news, what added services do you think should be available in a future e-newspaper?
   A Personalization, e.g. possibility to choose the parts of the content that you are willing to pay for
   B Community information, e.g. time tables, maps, traffic information
   C Personal information, e.g. phone book, schedule
   D Common information, e.g. dictionaries, manuals
   E Fiction and factional literature, magazines
   F Possibility to access yesterdays articles
   G Transactions, e.g. e-commerce, orders, bookings
   H Entertainment, e.g. games, horoscopes, movie tips

67 How important are the following attributes/factors for you choosing to read your newspaper on e-paper?
   A The appearance of the e-paper and its contents
   B The news are constantly updated
   C Offer of additional functions such as chat, motion pictures, interactivity
   D Ease of use and ease of learning
   E Trust in technology performance
   F Observation of people in my surrounding using the technology
   G Positive effect on the environment e.g. less paper production and tree fell
   H Importance of take part in new technology
   I Ease of finding what I am looking for/wish to read
Within which time frame are you ready to read your newspaper on e-paper?
A Today
B Within 5 years
C Within 10 years
D Within 20 years
E Never

Would you consider to, sometimes in the future, exchange your traditional printed newspaper for the e-newspaper?
A Yes
B No

APPENDIX C
Q no.
70 I actively contribute with letters to the editor, debates or comments about articles on the Internet
71 I would like to communicate more with other readers
73 I am often better informed than people in my surrounding about media content
74 I am often asked about media content
75 I am often well to the front with the latest technical products, e.g. mobile phones
76 I am often asked for advice about new technology
77 I prefer simple technology to advanced functionality
78 According to my opinion it is safe to use credit cards for payment on the Internet
79 It worries me that other people can see what information I send on the Internet
80 I have a desire to check for updates on the online newspapers I read
81 I benefit from reading news on sites that summarize news, e.g. Yahoo News
82 My online newspapers address local issues and debates that are of importance to me
83 My online newspapers address topics that are of importance for my leisure interests
84 I follow the same topics and news online as I do in other media
85 It irritates me if I find the same article in the printed newspaper as in the online newspaper
ABSTRACT
This article investigates how audience groups differ with respect to the adoption of new media services. The authors expand the existing framework of early adopters, which is heavily directed towards the technological aspects of a product, by including users that are more interested in the social and content-related aspects of media services. The objective is to identify and explore important audience groups that can be used as initial target groups for the introduction of the e-newspaper (a newspaper published on e-paper technology). Data was collected from in total 2976 respondents through the web sites of three Swedish newspapers.
INTRODUCTION

Organizations face a dilemma with regards to the potential business opportunities when they develop a new technology or adapt to a new technological standard. They can either disregard market signals and make a “proposal” to the market in terms of a new product (Verganti, 2005), or they can orient themselves to consumers preferences. In the first case, the risk of failure is very high. In the second case, there is a risk that the consumer orientation creates inertia for change – listening to current consumers may conserve organizational practices (Dahlsten, 2004; Danneels, 2003). To overcome the dilemma, techniques have been developed to analyze early market signals. In technology driven companies, it becomes natural to analyze consumers’ adoption of technological aspects of a new product. The perhaps most influential of these frameworks is Rogers’ (1995) notion of early adopters. These consumers are some of the first to use a technology or a product and to become important as a test bed for new innovations. It has therefore been in the interest of companies and market research organizations to identify these early adopters and test new ideas on them.

This was the case in the planned introduction of the e-newspaper, which was studied in a two-year collaborative research project called DigiNews, including several major technology firms, newspaper organizations and universities across Europe. The intention of the involved newspaper organizations was to use consumer research such as the early adopter approach to discover preferences of future consumers and use them as input for further development of the e-newspaper. The e-newspaper is a newspaper published on electronic paper (e-paper) – a technology which allows the same reader experience as paper such as high contrast and the possibility to read in sunlight. The e-newspaper is expected to become a convergence of the printed newspaper and the online newspaper (Ihlström et al., 2004). It has attracted the interest of newspaper organizations since the potential replacement of the printed edition in the future would dramatically reduce production and distribution costs.

In the case of the e-newspaper introduction, not only the technological aspects are important. The content as well as the social aspects of the innovation is central for its proliferation, since new media services are being developed for the device. This phenomena demand a different approach to analyzing consumer groups. Given this situation, it is not enough to focus solely on theories of technology adoption when planning the parallel introduction of a new technology and media services.

In this paper we propose an approach that considers both technology adoption and media consumption. Our overall research question is: How can we combine adoption theories with media consumption aspects to identify audience groups for parallel introduction of new technology and media services? The objective of this paper is to identify and explore
important consumer groups that can be used as initial target groups for the introduction of the e-newspaper.

For this purpose the paper is structured as follows: Section 2 describes the DigiNews case and is followed by a theory discussion in section 3. The research method is then described in section 4, the findings and analysis are presented in section 5 and section 6 concludes the paper with a discussion of the findings.

THE DIGINEWS CASE

DigiNews (ITEA 03015) is a recent European project that was finalized during the summer of 2006 and the project results were presented during the fall of 2006. The project started in 2004 after an initiative taken by Philips Applied technologies and the Newspaper Publishers’ Association. Partners were European newspaper organizations (e.g. Aftonbladet, De Telegraaf, Le Monde, Concentra Media), technology developers (e.g. Ibermatica, Robotiker), and Universities (e.g. Halmstad University, KTH, KUL Leuven).

The DigiNews project aimed at defining, architecting and demonstrating a solution of a digital newspaper. The solution included all parts needed to produce, distribute and consume digital news, i.e. all steps from publisher to reader. The project also explored ways to maximize the chances of a successful introduction to the market; this included the creation of different business plans and strategies. To reach the project goal and to ensure acceptance of the proposed digital newspaper system by the various stakeholders, three points-of-views were taken: user, business, and technology.

The project had the ambition to create a digital newspaper acceptable to a wide audience, by exploiting the potential of this digital media. Since the e-paper terminal used in the project had a much smaller display than the traditional printed newspaper, one challenge was to make this smaller format acceptable to the reader and to provide a user experience that was similar to reading a printed newspaper. Another challenge was to create a user interface that was easy to use, not only by computer experienced people, but for everybody.

During the project different e-newspaper prototypes (Figure 1) were developed for PCs and tablet PCs to be able to test conceptual ideas. These interactive prototypes were developed together with newspaper designers and used content from the newspaper partners. The prototypes allowed developers to test alternatives regarding for example navigation, the design of information structure and other interaction aspects.
E-paper Technology

One of the biggest advantages of using the e-paper technology is the readability of the display. E-paper is a wide-range term for a number of different technologies that can be used to produce displays; many of them have properties that can be compared with print on paper.

The technology works essentially in the same way, but instead of printing black dots on paper, the print is made electronically. Compared to transmissive displays such as LCD and TFT displays, e-paper is a reflective display technology. It has no backlight therefore the same reading properties as printed paper is granted. Transmissive displays that use backlight are in many cases almost unreadable in full sunlight. Many e-paper technologies have a high resolution that is comparable with the resolution used in traditional newspapers (170 dots per inch or more). This resolution is superior to the standard 72 dpi that is used on most of today's computer displays. The electronically made print also enables e-paper the same viewing angle as in any printed material. Another advantage of the technology is the low power consumption; power is only needed when the display is updated.

E-paper technology is developing rapidly and many actors invest in plastic electronics and produce new prototypes and products. Sony was the first company that launched an e-paper product on the Japanese market, the Sony LIBRlé. During autumn of 2006 Sony launched another e-reader, the Sony Reader, focused on the U.S. market (Sony, 2006). iRex Technology BV was the second actor that launched a commercially available e-paper reading device in April 2006 called the iLiad (iRex, 2006). Tianjin Jinke Electronics Co., LTD has several e-book products based on the same technology as Sony and iRex. The Hanlin ebooks also have almost the same specification as the Sony Reader. The company presents a roadmap with numerous new products including devices with bigger displays and dual displays that are planned to meet the market during 2007 (Tianjin Jinke, 2006). E-paper technology is also used in other products such as clocks and displays for mobile phones, Citizen, Seiko and Motorola have launched products based on e-paper displays. Table 1 (
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presents a brief summary of some of the competing e-paper technologies under development. In the DigiNews project, the iRex iLiad platform was used to present a solution for an electronic newspaper.

Potential Impact of E-Newspaper Introduction
In recent years the newspaper industry has experienced a decline in both advertising and subscription revenues (The Economist, August 26, 2006) which have lead them to seek other possible revenue opportunities, mainly exploring the digital arena.

Due to the obvious benefits of the e-paper technology described above, i.e. the resemblance of paper, the newspaper industry is taking an active interest in the development of the technology through projects like the DigiNews and IFRAs eNews initiative (IFRA, 2006).

If the printed newspaper could be replaced with an e-newspaper it would dramatically reduce production and distribution costs for the newspaper organizations. Several newspapers in Sweden are about to prospect new printing presses. Publishing the e-newspaper eliminates this stage of the newspaper production process which is costly and puts strains on deadlines, too. Many newspapers in Sweden have subscribers in sparsely populated areas which creates very high distribution costs. Delivering the newspaper electronically would reduce the distribution cost but also create new opportunities to reach potential readers all over the world. Furthermore, an e-newspaper allows for several editions a day or continuously updates like on the web.

<table>
<thead>
<tr>
<th>Developing company</th>
<th>Properties of the e-paper</th>
<th>Expected Release Date</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fujitsu</td>
<td>Bendable and vivid color display.</td>
<td>Between April 2006 and March 2007</td>
<td>Fujitsu (2005)</td>
</tr>
<tr>
<td>Plastic Logic</td>
<td>Printing on thin flexible plastic, production aimed at high volume and low cost.</td>
<td>-</td>
<td>Plastic Logic (2006)</td>
</tr>
<tr>
<td>Polymer Vision</td>
<td>Rollable display.</td>
<td>-</td>
<td>Polymer Vision (2006)</td>
</tr>
<tr>
<td>Hewlett Packard</td>
<td>Color display that is light, thin and flexible at a low production cost.</td>
<td>-</td>
<td>Sfgate.com (2006)</td>
</tr>
<tr>
<td>Siemens</td>
<td>Thin color display, able to show animations.</td>
<td>2007</td>
<td>Vnunet.com (2006)</td>
</tr>
</tbody>
</table>

Table 1. Summary of e-paper Technologies
The Chinese Yantai Daily Media Group is the first newspaper organization that has launched the e-newspaper commercially. The Chinese media group started in September 2006 to publish three newspapers on the iRex iLiad device. According to a press release from iRex, the President of Yantai Daily Media Group is “… convinced that this method of mobile digital printed media consumption will draw a lot of new users to reading our newspaper content” (iRex, 2006).

**Theoretical Background**

Technological shifts in the media business during the last 100 years have been of two kinds: the process improvement in the production of newspapers and the introduction of new media such as radio, television and the Internet. When a new technology or innovation has been included in the newspaper world, it has not always been an easy process. Such was the case with desktop publishing and pagination systems that made it possible to edit and layout the newspaper directly on the computer screen (Singer et al., 1999). The pagination systems were at introduction accused of creating more homogeneity among newspapers, and for reducing the role of reporters to data entry workers (Underwood, 1995). Another example is the introduction of online newspapers which initially was not embraced by all journalists (Ihlström and Palmer, 2002).

In the history of media the development of new technologies has been followed by developments in content. For example, newspapers did not disappear as a result of the introduction of radio or television as it was feared. Media forms seem to have complemented each other, as they have tended to take different roles (Weibull and Wadbring, 2000). Ihlström and Henfridsson (2004) argue that different genres have developed in different media forms, and Ziv (2005) argues that new content and services were key factors in making consumers adapt to new mobile devices. Media products include both technological and content related aspects. The medium (paper, radio, television, Internet, PDA etc.) itself carries the actual media service which becomes the focus of attention for potential consumers.

This means that consumers take on new and different roles in the relation to the media (Webster, 1998; Deery, 2003; Fredberg and Ollila, 2005). Media services have important social connotations through their content and their use (e.g. Bazalgette, 2005; Deery, 2003; Park, 1923). The members of the community formed around the media service (Johansson, 2002) become co-creators (Prahalad and Ramaswamy, 2003), and the community itself is an important part of the service (Hagel III and Armstrong, 1997).

To our knowledge, there exists no comprehensive overview of how newspaper organizations reason with regards to methods for analyzing new markets for media services. Also, the media industry does not have a tradition of product development to the same
extent as other industries. An example is the fact that several of the major European newspaper organizations do not have R&D departments.

To the extent that methods for analyzing future markets are used, developers seem to reason mostly using Rogers’ (1995) framework of early adopters. These consumers are some of the first to use a new product or innovation, and therefore have an important role in marketing the innovation to a greater mass of people. People that think about adopting the new technology turn to the early adopters for advice. Since early adopters are not too far ahead in the adoption curve, their preferences can serve as a proxy for those of the majority of consumers. Companies and researchers alike have therefore been focusing on this group to understand their preferences, as they would increase our understanding of the preference of the greater mass of consumers. The rationale is that if the group can be defined, then its constituents’ preferences can be researched, and guidance for further development be generated. Rogers’ framework on the diffusion of innovations primarily addresses the adoption rate of new technology and hence builds on a set of assumptions on people’s preferences for the technological aspects of a product.

With Rogers, the adoption rate over time is determined by the attitudes of the members of the social systems towards the characteristics of the innovation. These characteristics have five sources:

- Relative advantage – how much better potential adopters perceive the innovation to be in comparison to the current products or ideas. The advantage may for example be economical, in terms of social prestige, convenience or satisfaction.
- Compatibility – how consistent the innovation is with values, experiences, and needs of the potential adopters.
- Complexity – how difficult it is to understand and use the innovation.
- Trialability – how easy potential adopters may experiment with the product to learn to understand it.
- Observability – how evident the contribution of the innovation is to others.

To explain the diffusion of innovations, Rogers differentiates the rate of adoption among five groups of customers (or members of the social group/system): innovators, early adopters, early majority, late majority, and laggards.

Simply put, these aspects primarily relate to the technological aspects of a product. For many products, technological aspects are the easiest to measure. As a consequence, their characteristics can be used as arguments for managers or consumers wanting to make rational decisions. However, the technological aspect of a new product is not the only one that consumers take into consideration when making a purchase decision. Other aspects such as status (Vigneron and Johnson 1999), information value (Balasubramanian and Mahajan 2001), or experience (Arnould and Price 1993; Pine II and Gilmore 1999; Calder and Malthouse 2004) of a product or service also play an important role. A framework using only technological aspects only delivers partial answers as to why people adopt something.
a company perspective, this means that a reliance on the technology, early adopters will give one kind of development direction as to whether people will or will not adopt certain products or product characteristics.

The reliance on content in the development of new business creates a need to find an alternative approach to the analysis of how new services are introduced and why they become successful. Whereas Rogers (1995) relies heavily on the technological aspects of the product, new media innovations will include content aspects and media habits that cannot be ignored. The reliance on content and community related aspects in the development of new services make the media industry suitable for the development of another measure of innovation adoption. It is also of importance to the management of product development in newspaper organizations. Whereas a technologically driven company can rely on measurements such as early adopters, media companies need to put a heavier emphasis on content-aspects and media habits. We therefore argue that the case of a parallel introduction of new technology and media services needs further considerations such as media consumption issues.

Among media consumers, some are more active than others in taking part of and contributing to the media content (cf. Webster, 1998; Singer 2002). In this paper, we have chosen to call them active media consumers. The active media consumers have a focus on the content related and the participatory aspects of the product and are in that sense the content side equivalents to early adopters. They are not necessarily early adopters of a product in Rogers’ (1995) meaning, but a kind of “expert consumers” (for a discussion, see Bettman and Sujan 1987). They are more advanced in their media consumption, but are not likely to be homogenous with regards to media content preferences. Instead of high interest and consumption of new technology they have a high interest and consumption of new media that is accessible anywhere and anytime. Depending on the kind of innovation which is tested and introduced, one group or the other may be more important.

In the case of the e-newspaper, the introduction has a technological aspect as well as a content-related aspect, since new media services are being developed for the device. Early adopters may be important for the introduction of the device itself, i.e. the technology, whereas active media consumers may be interested in the introduction of new media services.

**METHOD**

In order to identify consumer groups for a parallel introduction of both a new technology and media services a qualitative approach has been taken (Hair et al., 2005). This study can be labeled as opinion research (Jenkins, 1985) with the objective to gather data on attitudes, opinions, impressions and beliefs of human subjects. This was accomplished by using a questionnaire.
DATA COLLECTION
We choose to use online questionnaires because that allowed us to provide information for the respondents to obtain an understanding of the e-newspaper concept. Since we assumed that the e-newspaper concept was unknown to most of the potential respondents we provided them with the possibilities to:

- read more about e-paper technology,
- watch three concept videos (see below), and
- explore the e-newspaper prototype of the corresponding newspaper.

Another reason for choosing online questionnaires is that web samples can be as representative, as or even more representative than traditionally collected samples because of the heterogeneity of the online population (Buchanan and Smith, 1999). Admittedly, there are inherent problems in controlling who responds to online questionnaires. Control for cases with multiple submissions from the same IP number was excluded in the data collection.

We presented the questionnaire at the news sites of the three Swedish newspapers that we have collaborated with in developing e-newspaper prototypes within the DigiNews project, i.e. Aftonbladet, Göteborgs-Posten and Sundsvalls Tidning. Aftonbladet is a quality tabloid with the most visited news site in Sweden, Göteborgs-Posten is a local morning paper covering Göteborg (the second largest city in Sweden) and its surroundings, and Sundsvalls Tidning is a local morning paper in the north of Sweden.

In parallel with the DigiNews project three short concept movies of future e-newspaper use were developed to further illustrate the potential of the e-newspaper. These movies were created in collaboration with SVID (Stiftelsen Svensk Industridesign), the design company Propeller AB and the Swedish Newspaper Publishers’ Association. The movies envisioned the benefits of the e-newspaper for three different personas: the business woman, the student and the senior citizen (identified as potential target groups in the DigiNews project). Close ups on the designed user interface together with examples of functions demonstrated the future e-newspaper in detail. The scenarios were based on preferences articulated by respondents in workshops and interviews in the early stage of the DigiNews project and showed how a future e-newspaper could support the media consumption of the three personas in different contexts. These movies were presented to the respondents to further illustrate the e-newspaper concept.

Three approaches for presenting the questionnaire were used in the study, a) a newspaper article explaining the e-newspaper concept at Aftonbladet’s www.aftonbladet.se, b) a banner at Göteborgs-Posten’s www.gp.se, and c) a pop-up window at Sundsvalls Tidning’s www.st.nu.
a) In conjunction to the article, links to the three concept videos and to the Aftonbladet e-newspaper prototype were presented. There was also a written invitation to participate in the questionnaire presented together with a link to the starting page of the questionnaire. The article was placed on the front page of www.aftonbladet.se on April 7th (11.23 AM), was moved to the IT section on April 10th and removed on April 11th (5.00 PM). At www.aftonbladet.se, 3757 respondents answered the questionnaire.

b) The banner (Figure 2) read “Do you want to influence the future e-newspaper? Click here!” By clicking the banner the visitor was directed to the starting page of the questionnaire. The banner was placed on www.gp.se between April 7th (10.23 AM) to April 12th (07.54 AM), only resulting in 135 respondents.

c) A full size pop-up window was presented each time a visitor entered the front page at www.st.nu between April 7th (12.10 AM) to April 12th (09.15 AM) resulting in 447 respondents. The pop-up window presented the starting page of the questionnaire.

![Figure 2. Banner at www.gp.se](image)

The questionnaire consisted of 127 questions in total, divided in 4 different parts, i.e. background questions, business models, e-newspaper preferences and preferences of mobile services. The first part contained 20 questions with regard to demographic nature (5), media consumption (3), technology use (5) and the use of mobile services (7). Question 14 was the initial question about the use of mobile services and also controlled whether section 4 (mobile services) should be presented to the respondent or not. The second part consisted of 40 questions concerning business models for the e-newspaper while the third part 26 questions about e-newspaper preferences as well as several key questions for identifying users groups. Finally, the last part consisted of 41 questions with regard to preferences for mobile services on PDAs and mobile phones. Many of the questions where of multiple choice nature, however, several open questions were included as well.

In this paper we only report about part one and three. Only respondents who pushed the submit button at each section of the questionnaire were included in this survey. As can be seen in Table 2, 2976 respondents answered the questions that are analyzed in this paper. In total, 4339 readers answered fully or partly to the questionnaire.
We identified early adopters of technology from 5 key questions and active media consumers from 6 key questions in section one and three of the questionnaire. The questions to identify early adopters concerned possession of and interest in new technology as well as questions about if the respondents talk about technology and is asked about new technology. The questions to identify active media consumers concerned media habits, consumption and interest in media in general. The respondents were also asked if they often discuss news and if they believe they are better informed about news than people in general.

The dataset was split in four groups in the analysis; early adopters, active media consumers, the above who were identified as both early adopters and active media consumers, and finally, those who were none of those. A comparative analysis between these four groups was conducted using percentage of frequencies and means of Likert scale questions.

**Findings and Analysis**

We have argued that one group of consumers may be more focused on the technological aspects of a product and another group on the social and content-related aspects. As described above, the first group is often called *early adopters* and we have chosen to call the second group *active media consumers*. Active media consumers have a high interest and consumption of new media that is accessible “anywhere and anytime”. Depending on the kind of innovation which is tested and introduced, one group or the other may be more important. Early adopters may be important for the introduction of the *device* itself, i.e. the technology, whereas active media consumers may be interested in the introduction of new media services. The cross-section between the groups is likely to be the most important for the introduction of new media technology. This third group we call *engaged media users*. Engaged media users is a blend of early adopters and active media consumers, i.e. they have a high interest in both new technology and active media consumption. We argue that a
definition of these engaged media users provides possibilities for a better understanding of the development of media markets and a better management of service development in the media sector.

In this section we present the analysis from part three of the questionnaire. We have divided the presentation of the results in four categories of respondents, early adopters (648) active media consumers (288), engaged media users (393), and the others group (878). Figure 3 shows the distribution of early adopters and active media consumers within the data set.

In the following analysis we account for the preferences of issues related to the e-newspaper introduction for each group respectively. Further, we have divided the presentation of the results into three themes, i.e. content preferences, readiness to change, change to the printed edition, and willingness to pay for the e-newspaper.

The three groups of consumers above together with the others group have similar distributions of age, occupation, income, education, and age. However, there is a difference in the distribution by gender (Table 3).

<table>
<thead>
<tr>
<th>Gender</th>
<th>Early Adopters</th>
<th>Active Media Consumers</th>
<th>Engaged Media Users</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Freq</td>
<td>%</td>
<td>Freq</td>
<td>%</td>
</tr>
<tr>
<td>Men</td>
<td>503</td>
<td>77,6</td>
<td>172</td>
<td>59,7</td>
</tr>
<tr>
<td>Women</td>
<td>145</td>
<td>22,4</td>
<td>116</td>
<td>40,3</td>
</tr>
<tr>
<td>Total</td>
<td>648</td>
<td>100</td>
<td>288</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 3. Distribution by Genders

The distribution of men and women in the others group is fairly even while there are more men than women in the other three. In the early adopter and engaged media users groups there are only slightly more than 20% women.
CONTENT PREFERENCES

The content preferences theme concerns the added value services that users consider to be preferable together with the e-newspaper. Respondents were also asked about the reasons for their preferences. They rated the factors on a 7-point Likert scale where 1 represented not interesting and 7 very interesting. In Table 4 the means per item is presented for each user group.

<table>
<thead>
<tr>
<th>Added service value</th>
<th>Early Adopters</th>
<th>Active Media Consumers</th>
<th>Engaged Media Users</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personalized news</td>
<td>5.58</td>
<td>5.27</td>
<td>5.84</td>
<td>5.21</td>
</tr>
<tr>
<td>Community information (time, maps)</td>
<td>5.63</td>
<td>5.35</td>
<td>5.74</td>
<td>5.18</td>
</tr>
<tr>
<td>Personal information (calendar, phone book)</td>
<td>3.92</td>
<td>3.59</td>
<td>4.56</td>
<td>3.15</td>
</tr>
<tr>
<td>General information (manuals, Encyclopedia)</td>
<td>4.64</td>
<td>4.65</td>
<td>5.18</td>
<td>4.26</td>
</tr>
<tr>
<td>Books and magazines</td>
<td>4.15</td>
<td>4.30</td>
<td>4.79</td>
<td>3.73</td>
</tr>
<tr>
<td>News archive</td>
<td>6.30</td>
<td>6.41</td>
<td>6.38</td>
<td>6.07</td>
</tr>
<tr>
<td>Transactions (e-commerce, bookings)</td>
<td>4.65</td>
<td>4.35</td>
<td>5.11</td>
<td>3.92</td>
</tr>
<tr>
<td>Entertainment</td>
<td>5.07</td>
<td>4.79</td>
<td>5.30</td>
<td>4.77</td>
</tr>
</tbody>
</table>

Table 4. Mean Ratings of Preferred Added Service Value

This data shows that the three groups early adopters, active media consumers, and engaged media users generally have stronger preferences than the others group. All of the suggested added services were rated as less interesting by these respondents. The opinions are similar between the audience groups early adopters, active media consumers, and engaged media users. It is interesting to notice that news archive is considered the most interesting and that personal information the least interesting by all three groups. Overall the engaged media user group has the highest rating of preferred added value of the different services. This may be connected to influencing factors for exchange of the printed paper to the e-newspaper (Table 4), where this group rated added service value highest of the three groups. All in all, this data indicates that the three groups are all relevant to consider as initial target groups as they have similar strengths in preferences and that they all differ significantly to the others group.

The respondents were then asked to choose the one added service value suggested in the previous question that they found the most interesting. The percentage of respondents within each category that choose the different added service values is presented in Table 5 below. It is interesting to notice the shift in ranking when the respondents had to choose between the added service values. The most important added service value for all four audience groups were personalized news followed by archives, and additional content such as community information and personal information. It is noticeable that the personal information is found much less interesting and news archive more interesting by active
media consumers and the others group compared to the other groups. However, this data implies that the majority have similar patterns of prioritizing which in turn indicates that the offer of added value services can be uniform.

<table>
<thead>
<tr>
<th>Added Service Value</th>
<th>Early Adopters</th>
<th>Active Media Consumers</th>
<th>Engaged Media Users</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personalized news</td>
<td>52.3%</td>
<td>46%</td>
<td>53.2%</td>
<td>48.1%</td>
</tr>
<tr>
<td>Community information</td>
<td>14%</td>
<td>12%</td>
<td>12.3%</td>
<td>13.8%</td>
</tr>
<tr>
<td>Personal information</td>
<td>14%</td>
<td>2.2%</td>
<td>12.3%</td>
<td>1.7%</td>
</tr>
<tr>
<td>General information</td>
<td>3.1%</td>
<td>2.6%</td>
<td>4.3%</td>
<td>2.4%</td>
</tr>
<tr>
<td>Books and magazines</td>
<td>5%</td>
<td>4.7%</td>
<td>5.1%</td>
<td>3.5%</td>
</tr>
<tr>
<td>News archive</td>
<td>15.2%</td>
<td>22.3%</td>
<td>14.3%</td>
<td>21.1%</td>
</tr>
<tr>
<td>Transactions</td>
<td>2.8%</td>
<td>3.3%</td>
<td>2.8%</td>
<td>1.3%</td>
</tr>
<tr>
<td>Entertainment</td>
<td>5%</td>
<td>6.9%</td>
<td>6.1%</td>
<td>8.2%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 5. Preferred Added Service Value

The respondents were also asked about the reason for choosing that particular added value service. They were asked to rate the factors on a 7-grade Likert scale where 1 represents do not agree and 7 agree. In Table 6 the means per item for each user group is presented.

<table>
<thead>
<tr>
<th>Reasons</th>
<th>Early Adopters</th>
<th>Active Media Consumers</th>
<th>Engaged Media Users</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benefit greater than cost</td>
<td>4.89</td>
<td>5.16</td>
<td>5.24</td>
<td>4.63</td>
</tr>
<tr>
<td>Time saving</td>
<td>5.47</td>
<td>5.71</td>
<td>5.86</td>
<td>5.09</td>
</tr>
<tr>
<td>Provides valuable information</td>
<td>5.95</td>
<td>6.09</td>
<td>6.19</td>
<td>5.70</td>
</tr>
<tr>
<td>Provides added value</td>
<td>5.89</td>
<td>6.01</td>
<td>6.19</td>
<td>5.60</td>
</tr>
<tr>
<td>Interest in latest services</td>
<td>4.37</td>
<td>3.29</td>
<td>4.76</td>
<td>2.66</td>
</tr>
<tr>
<td>Simplifies work tasks</td>
<td>3.55</td>
<td>3.76</td>
<td>4.34</td>
<td>2.64</td>
</tr>
</tbody>
</table>

Table 6. Reasons for Choosing Added Service Value

The ranking between the reasons is similar between the four groups. All consider valuable information, the added value, and time savings to be the most important reasons. Simplifying work tasks and interest in latest services are the least interesting reason for all groups. Nevertheless, there is an interesting difference, the others group has lower means for all suggested reasons. This is another indicator for presuming that the three groups early adopters, active media consumers, and engaged users are all relevant to consider as initial target groups.
READINESS TO CHANGE

The theme readiness to change concerns when the respondents believe they will be willing to read their newspaper on e-paper and if they would consider replacing the printed newspaper with a future e-newspaper. The theme also includes questions about the factors influencing the decisions.

The respondents answered within which timeframe they believe they are prepared to read the newspaper on e-paper (Table 7).

<table>
<thead>
<tr>
<th>Time frame</th>
<th>Early Adopters</th>
<th>Active Media Consumers</th>
<th>Engaged Media Users</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Today</td>
<td>71.4%</td>
<td>54.1%</td>
<td>78.6%</td>
<td>43.6%</td>
</tr>
<tr>
<td>Within 5 years</td>
<td>21%</td>
<td>27.2%</td>
<td>16.4%</td>
<td>30.1%</td>
</tr>
<tr>
<td>Within 10 years</td>
<td>4.4%</td>
<td>9%</td>
<td>4%</td>
<td>11.4%</td>
</tr>
<tr>
<td>Within 20 years</td>
<td>1.2%</td>
<td>2.5%</td>
<td>0.5%</td>
<td>3.9%</td>
</tr>
<tr>
<td>Never</td>
<td>2.0%</td>
<td>7.2%</td>
<td>0.5%</td>
<td>11.0%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 7. Time frame

The group that is the most prepared to read the e-newspaper today is clearly engaged media users followed by early adopters and the majority of active media consumers are also prepared to read the newspaper on e-paper today. The others group is more pending and as many as 11% of the respondents claim they will never read on e-paper. The respondents were asked if they would consider exchanging their printed newspaper to an e-newspaper sometime in the future (Table 8).

<table>
<thead>
<tr>
<th></th>
<th>Early Adopters</th>
<th>Active Media Consumers</th>
<th>Engaged Media Users</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>88.3%</td>
<td>72.3%</td>
<td>93.2%</td>
<td>67.5%</td>
</tr>
<tr>
<td>No</td>
<td>11.7%</td>
<td>27.7%</td>
<td>6.8%</td>
<td>32.5%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 8. Willingness to exchange

This result clearly shows that the engaged media users have the most positive attitude towards exchanging the printed newspaper into the e-newspaper. The most negative is the others group.

The respondents were then asked to rate factors that influence the willingness to exchange the printed newspaper with an e-newspaper. They answered on a 7-grade Likert scale where 1 represents do not agree and 7 agree. In Table 9 the means per item for each user group and in Table 10 the ranking within each group are presented.
As can be seen in Table 9, all items are rated lower by the others group. Early adopters rate all items higher than active media consumers. It is also noticeable that engaged media users in general rate these factors the highest. Table 10 shows the relative importance of different aspects of the e-newspaper for the adoption of the e-newspaper.

<table>
<thead>
<tr>
<th>Ranking</th>
<th>Early adopters</th>
<th>Active media consumers</th>
<th>Engaged media users</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Anytime anywhere access</td>
<td>Anytime anywhere access</td>
<td>Anytime anywhere access</td>
<td>Anytime anywhere access</td>
</tr>
<tr>
<td>2</td>
<td>Added service value</td>
<td>Economical savings</td>
<td>Added service value</td>
<td>Economical savings</td>
</tr>
<tr>
<td>3</td>
<td>TimeSavings</td>
<td>Added service value</td>
<td>TimeSavings</td>
<td>Added service value</td>
</tr>
<tr>
<td>4</td>
<td>Economical savings</td>
<td>Time savings</td>
<td>Economical savings</td>
<td>Environmental reasons</td>
</tr>
<tr>
<td>5</td>
<td>Environmental reasons</td>
<td>Environmental reasons</td>
<td>Environmental reasons</td>
<td>Time savings</td>
</tr>
</tbody>
</table>

Table 10. Ranking of Influencing Factors for Exchange within Each Group

All groups rate anytime anywhere access the most important. Economical savings and time savings are more important to active media consumers and the others group whereas added service value is rated higher by early adopters and engaged media users. Time savings is on third place for early adopters and engaged media users while active media consumers rank it as fourth and the others group as fifth. Environmental reason does not seem to be very important to any of the audience groups. All things considered, the pattern of factors influencing the adoption seems similar. Nonetheless, engaged media users show the strongest tendency of valuing these factors high.

The next question on this theme concerned the importance of different factors for choosing to read the e-newspaper. The respondents rated the factors on a 7-point Likert scale where 1 represents *not important* and 7 *very important*. In Table 11 the means per item is presented for each user group.
Table 11. Means of Rating of Importance of Factors for Choosing to Read the e-Newspaper

<table>
<thead>
<tr>
<th>Item</th>
<th>Early Adopters</th>
<th>Active Media Consumers</th>
<th>Engaged Media Users</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Layout</td>
<td>5.57</td>
<td>5.20</td>
<td>5.61</td>
<td>5.01</td>
</tr>
<tr>
<td>Continuous updates</td>
<td>6.37</td>
<td>6.45</td>
<td>6.55</td>
<td>6.00</td>
</tr>
<tr>
<td>Interactive functions</td>
<td>4.44</td>
<td>4.01</td>
<td>5.05</td>
<td>3.51</td>
</tr>
<tr>
<td>Ease of use</td>
<td>5.81</td>
<td>6.13</td>
<td>5.62</td>
<td>6.29</td>
</tr>
<tr>
<td>Dependable technique</td>
<td>6.41</td>
<td>6.52</td>
<td>6.40</td>
<td>6.37</td>
</tr>
<tr>
<td>Environmental issues</td>
<td>4.93</td>
<td>4.97</td>
<td>5.17</td>
<td>4.72</td>
</tr>
<tr>
<td>Easy navigation</td>
<td>6.44</td>
<td>6.50</td>
<td>6.57</td>
<td>6.14</td>
</tr>
</tbody>
</table>

Yet again all items are rated lower by the others group except for one, i.e. ease of use, which is rated the highest by this group. The interest for interactive functions and environmental factors is generally low whereas dependable technique, ease of use, easy navigation and updates are rated higher. This indicates that the influencing factors are more or less ranked in the same order even though they in general are considered more important by engaged media users.

WILLINGNESS TO PAY

The theme willingness to pay concerned attitudes towards cost levels and the financing of the e-reader device. The respondents were asked about the acceptable cost level for exchanging the printed newspaper with the e-newspaper (Table 12).

<table>
<thead>
<tr>
<th>Cost level</th>
<th>Early Adopters</th>
<th>Active Media Consumers</th>
<th>Engaged Media Users</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cheaper than the printed newspaper</td>
<td>70%</td>
<td>71.1%</td>
<td>63.6%</td>
<td>74.1%</td>
</tr>
<tr>
<td>Same price as the printed newspaper</td>
<td>14.4%</td>
<td>14.3%</td>
<td>13.8%</td>
<td>12.4%</td>
</tr>
<tr>
<td>Can be more expensive if providing added value</td>
<td>11.4%</td>
<td>8.5%</td>
<td>17.3%</td>
<td>8%</td>
</tr>
<tr>
<td>Price is not essential</td>
<td>4.2%</td>
<td>6.1%</td>
<td>5.3%</td>
<td>5.5%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 12. Acceptable Cost Level for Exchange

The accepted cost level is similar between the four groups. The engaged media users are slightly more inclined to accept a higher price if there is added value and are more accepting to a higher price than the other three groups. However, all four groups clearly indicate that they expect a lower price to consider exchanging the printed newspaper with the e-Reader device.
The next question on this theme regarded opinions about how the e-Reader device should be financed. The respondents were given three alternatives to choose from (Table 13).

The group most willing to purchase the e-reader device is the engaged media users and the active media consumers are the least willing to pay for the e-reader. The majority of all four audience groups think the e-newspaper should be free with a subscription, even though engaged media users do not think so to the same extent.

<table>
<thead>
<tr>
<th>Finance model</th>
<th>Early Adopters</th>
<th>Active Media Consumers</th>
<th>Engaged Media Users</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchase by instalments</td>
<td>12.5%</td>
<td>11.4%</td>
<td>11.3%</td>
<td>9.2%</td>
</tr>
<tr>
<td>Purchased by the user</td>
<td>27.5%</td>
<td>23.8%</td>
<td>32.4%</td>
<td>25.1%</td>
</tr>
<tr>
<td>Free with a newspaper subscription</td>
<td>60%</td>
<td>64.8%</td>
<td>56.3%</td>
<td>65.6%</td>
</tr>
<tr>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

*Table 13. E-Reader Device Finance Models*

**DISCUSSION AND CONCLUSION**

In this paper, we have addressed the question of how to combine adoption theory with media consumption aspects to identify audience groups for parallel introduction of new technology and media services. We set out to experiment with different audience groups to study how they differ with respect to the adoption of new media services, combining early adopter profiles with social and content-related aspects of media services. This resulted in identifying interesting consumer groups for introducing new media technology together with new media services: (1) the traditional early adopter group, (2) active media consumers, and a very interesting new group (3) engaged media users.

In analyzing the results of our survey, we found some interesting differences between the early adopters, the active media consumers and the engaged media users compared to the others group. Regarding content preferences the three groups early adopters, active media consumers and engaged media users are similar, however the engaged media users have the strongest likelihood to exchange the printed newspaper for an e-newspaper. This is also the group with the strongest willingness to pay for the new offer. The group of engaged media users may be important as a segment for analysis when introducing new media offers that encompass technological as well as content and socially related aspects. Our analysis in this paper shows that active media consumers have as strong preferences as early adopters, but their preferences are slightly different. This makes them an important group to analyze.
separately from early adopters. We argue that the impact and use of this group may be the largest when introducing innovations with content (as opposed to strictly technology). The introduction of the third audience group, the engaged media users, allows us to analyze respondents that fit into both categories.

In this case, investigating preferences for a future e-newspaper, the content and socially related aspects were proven to be very important. We could also show that the active media consumer group has as strong preferences and interests as early adopters and that these aspect matter to the early adopter group as well as technological issues. The objective of the paper was to identify important audience groups that can be used as initial target groups for the introduction of the e-newspaper. We have discussed differences and similarities between different audience groups in order to shed light on possible strategies for the e-newspaper introduction.

We argue that the focus on early adopters, and thereby the technical aspects of a new innovation, is too limited when it comes to highly “mediated” products and services for which an important part of the product offering is related to the social values that consumers enjoy. As organizations tend to focus on the preferences of early adopters they are therefore limited in their approach. The preferences of active media consumers give way to a different kind of analysis which is complementary to that of Rogers’ (1995). We believe that an expansion of Rogers’ (1995) framework would be fruitful for a better understanding of the development of media markets and would offer better possibilities to manage the introduction of new media technologies and new media services. Broadening the technology focus with social and content related aspects of media services gives a more comprehensive analysis, and thus is more likely to correspond to the audience adoption patterns.

How does this improve our previous understanding? The prime gain from using the framework of early adopters is the time span between the early adopters’ use of a new product or service and that of the mass market. Organizations can hence adapt to this prognosis of future market preferences and adjust its products and product portfolio. The behavior of early adopters remains important for the introduction of new technological functions in products. But as shown in this paper there are other groups to consider when it comes to the introduction of a new media product or service. Considering the group of active media consumers for instance builds on the existence of expert consumers that are high up in what one may call a “consumption hierarchy” (Rogers 1995). These consumers are characterized by a high degree of consumption or use of their products. Instead of gaining time (as with early adopters) to adjust product attributes and the product portfolio, the active media consumers give way to an understanding of the potential consumption hierarchy for a new product in connection to its use. If companies organize their product portfolio in accordance, this means that they differentiate products and services on price, prestige, communication intensity, or other dimensions of the social value of innovations. For novices, there is a basic set of consumption possibilities. For more advanced consumers, there are add-ons to be consumed, generating a pyramid of consumption possibilities. The
consumption by those at the top of the pyramid have prognostic value for the social aspects of the new media forms, as we can assume that they through their preferences are more aware of the social value of the media, and hence will examine those aspects more critically when faced with new media.

Our analysis is based on data from the newspaper industry. It has been acknowledged, however, that more and more products or services also in other industries are becoming mediated. Beside the technical aspects of the products their content is becoming increasingly important (Normann and Ramírez 1994; Normann 2001). In a mobile phone, the communication facilities are of crucial importance but the mobile phones business of today is relying on media content. Thereby the adoption of new mobile phones is influenced both by the technical innovation and the media content.

We therefore suggest that one possible strategy for new media products and services that may benefit organizations is to seek out the engaged media users to find a foothold in the market. Such would be the case also for the e-newspaper. Further research should dig deeper into the characteristics and adoption patterns of audience groups such as engaged media users and active media consumers, and to compare them with those of early adopters. This would be useful to further understand the market potential of an e-newspaper, but also for other media products or services.

REFERENCES


INTERNET REFERENCES


