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**Cultivating the Norwegian Mobile
Internet:**

A critical inquiry into high level services
based on mobile telecommunication
technologies

Master thesis
30 credits

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PREFACE AND ACKNOWLEDGEMENTS

This Master thesis is submitted in partial fulfillment for my Master's degree in Informatics (Information Systems*¹) at the Department of Informatics, University of Oslo. The work was carried out between 18th of August 2008 and 15th of December 2008.

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¹ Concepts assigned with an asterisk (*) are explained in Appendix 1.

ABSTRACT

In this thesis the Norwegian Mobile Internet (NMI) is investigated. The critical approach, to my research, stems from a Habermasian concern for collective liberation through the cultivation of a (networked) public sphere, as well as a Foucauldinian concern for individual self liberation. The investigation draws upon two conceptual frameworks, namely, Actor-Network Theory and *generativity*. Here, the concept of generativity lends special attention to how well the presence of current mobile telecommunication technologies and services, allow for the innovation, development and adoption of new high level services.

Through the application of the two conceptual frameworks, the thesis seeks to investigate the NMI's generative capacity as well as its emancipatory potential. My findings suggest that the somewhat obscure pricing schemes on mobile data traffic, in conjunction with the lack of a strong de facto* standard for publishing and retrieving mobile browser content, is generally hampering the emancipatory potential of the NMI. In addition, I suggest that the mobile telecom operators also being directly involved in mobile content provision (e.g. CPA-platform), is keeping a lid on innovation. The main reason for this is the increased incentives for mobile telecom operators to control both content providers' and end users' interests towards the NMI.

KEYWORDS

Information Systems, IS, Information and Communication Technology, ICT, Actor Network Theory, ANT, Critical (Social) Theory, CST, democracy, emancipation, the (Networked) Public Sphere, philosophy, Mobile Internet, mobile telecommunication, generativity, convergence, standards, mobile phones

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1 INTRODUCTION

During the last decade, we have witnessed an enormous increase in global Internet penetration. The Internet has launched us into what Castells (2001) characterize as the 'information era'. As with former breakthroughs in Information and Communication Technology* (ICT) (e.g. Gutenberg's printing press, the telephone, the telefax, the radio and the television) the Internet has also opened the doors for new and beneficial means of communication and information sharing. At the same time, the Internet has brought with it certain elements of risk, like the emergence of large hierarchical power structures culminating into centralized control over complex technologies.

Today, there is a growing public awareness of the socio-political potential embedded in the Internet and other large scaled communication and information sharing networks, and with this growing awareness new and challenging research questions emerge. A plethora of these questions have already been addressed by scholars from various fields such as sociology, anthropology, informatics, political science and law. I will bring attention to some of these scholarly contributions, which I find strictly relevant to my work, in chapter two (Theory).

Our PCs, whilst connected to the Internet, let us explore and enjoy an ever increasing multitude of high level services (e.g. email, interactive web, peer-to-peer file sharing, instant messaging, online communities, Facebook, youtube, etc). These services, along with a great variety of new ones, tailored to suit our 'on the go' and 'in the fast lane' lifestyles, have been widely anticipated to flourish and make our mobile everyday lives richer and more rewarding. However, the (Norwegian) Mobile Internet has, thus far, failed to live up to many of these expectations. Arguably, some expectations concerning certain high level services e.g. mobile video telephony may indeed have been too high, considering the extensive list of both social and practical barriers compiled by O'Hara, Black, et al. (2006). In relation to more established Mobile Internet technologies and standards, like WAP*, a lot of research has been done to improve the user experience, see Buchanan, Farrant, et al., (2001). Admittedly, most Norwegians, in their everyday lives, at work or at home,

have nearly continuous access to desktop computers or portable laptop computers with larger screens, straightforward means of input and faster network speed than their handheld counterparts. In addition, empirical studies, although Korean and hence not directly comparable, indicate, contrary to common belief, that: "use contexts of Mobile Internet are of a concentrated type rather than being widely diverse (Kim et al. 2002)". In fact, the Korean authors suggest that we use the Mobile Internet the most when we are alone, in a dim lit and quiet place, typically in our bedrooms or in the office. Still, the consensus shared by IT-companies, telecom operators, application developers, content providers, online stores, the media and the general public seems to be that a lot is to be desired in terms of innovation, development and adoption of high level services based on mobile telecommunication technologies in Norway.

Hanseth and Nielsen (2007) have already embarked upon a case study exploring the Norwegian Mobile Internet (NMI). In their analysis, they apply the very same conceptual framework, as will be applied in this thesis; Zittrain's (2006) concept of generativity. However, the authors are more concerned with describing certain instances of the NMI (e.g. the CPA-platform, Mobilinfo and SMSinfo), as opposed to the NMI as a whole. As the authors state themselves: "issues related to how to enable broadest possible innovative activities by infrastructural technology design" were at the centre of their attention. Indeed, the authors were able to identify and convincingly describe key infrastructural characteristics of the successful CPA-platform. Due to its success, the CPA-platform has achieved an influential role in what here is characterize as the NMI. This, however, calls for the raising of other questions. For instance, what are the socio-political implications of a strong and influential CPA-platform? Or, may the success of the CPA-platform, in any way, constrain or hamper the innovation, development and adoption of other high level services, maybe with a greater democratizing and self liberating potential?

1.1 Scope, structure and problem formulation

Scope: Throughout this thesis I will explore the level of innovation, development and adoption of high level services based on mobile telecommunication technologies in Norway. The clearest delimitation to the scope of my investigation of the NMI, besides from the obvious focus on national trends, is my deliberate focus on the roles played by the mobile telecom operators, Telenor in particular.

Structure: In the following section, I will introduce the case of the NMI and argue how the Mobile Internet can be said to have national borders. My second chapter (Theory) sets out by introducing several different theories and philosophies regarding the emancipatory potential of the (Mobile) Internet. Subsequently, I will introduce the two conceptual frameworks which I have found useful, for my analysis of the NMI; generativity and Actor Network Theory. The third chapter of my thesis (Methods) opens with a description and justification of the underlying epistemology, critical theory, on which this research is based. Consequently, it gives accounts for my empirical work - mainly consisting of three in-depth interviews, along with studies of various documents and online resources. Chapter four (Analysis) consists of an analysis of the generative capacity of the NMI, as well as a description of key characteristics of the extremely complex socio-technical network of inter-related actors involved in the cultivation of the NMI. The analysis and description culminates into an evaluation of the overall generative capacity of the NMI, and hence, as I will argue, also an indication of its emancipatory potential. My reflections are presented in chapter five, mainly addressing the applicability of generativity as a conceptual framework and perceived ambiguities with the term Mobile Internet. Finally, my concluding remarks and implications for future work can be found in chapter six.

Problem formulation: In this critical inquiry I seek to shed light on what factors might be hampering the NMI's overall capacity to spur the (peer) production and disclosure of information and points of view, which can be built upon, filtered and synthesized by a large, varied and uncoordinated audience, as well as lend itself to internalization and application by the individual in her local context.

1.2 A case study: The Norwegian Mobile Internet

"The Mobile Internet is nearly at a halt", or at least so it is stated in the headline of an article published by the Norwegian online news mediator digi.no (Aug. 27th 2008). The article is based on an interview with information manager Øyvind Vederhus in NetCom, the second largest mobile telecommunication operator in Norway. In the article it is pointed out that the sales of NetCom's so called *Connect*-subscriptions were tripled from 2006 to 2007. Connect is the name of a service that lets the consumer connect her PC to the Internet using a mobile phone as a modem, via the 3G-network¹. Furthermore, the news article states that the traffic directed to the actual screens of the mobile devices has not increased at all. The last statement is backed up by figures depicting the WAP*-traffic in NetCom networks during 2007. In an attempt to explain the lack of interest in Mobile Internet penetration, Vederhus points out that the price of the services could be a determining factor.

1.2.1 Mobile Web Surfing

Both Telenor and NetCom have decided upon fairly unorthodox price models for data traffic going through their mobile networks. Instead of a small scalable price, both operators have decided to charge a fixed amount for one megabyte of traffic. In NetCom's case the price is 20NOK and in Telenor's case it is 12,50NOK. At the same time, 20NOK is the maximum daily charge using NetCom's service (NetCom, Oct. 14th 2008) - all surfing or traffic consumption exceeding one megabyte is free. Telenor on the other hand, has set the maximum daily charge for data traffic to 75NOK (Telenor, Oct. 14th 2008). For a consumer with daily traffic consumption exceeding one megabyte, the NetCom subscription would result in a yearly expense of 7300NOK.

¹A mobile phone that supports 3G and Bluetooth 2.0 can act as a gateway and router and provide Internet connections for multiple Bluetooth-capable laptops.

Unfortunately, there is practically no way for the inexperienced consumer to keep a reasonable level of control over her mobile surfing expenses - as I will illustrate with an example. If you try to access the webpage at www.dagbladet.no through your mobile web-browser, you will automatically be redirected to a mobile version of the requested news mediator's web page, consuming about 100Kb of traffic. If you instead try to access www.vg.no you will be directed to this news mediator's standard web page, which will typically consume ten or even fifteen times more traffic. Some sites only have their mobile versions made available through alternatively prefixed URLs, while other sites support browser recognition and an automatic redirection of traffic. When a mobile version of the desired web page cannot be found by typing *mobil*, *mobile*, *mob*, *wap*, *wml*, *m* or any other semi-standardized prefix in front of the URL, the consumer will be forced to resort to gambling. The gambling strategy may cause the consumer to access a standard version of the desired web page, which could contain a video clip or some animated graphics, forcing her to immediately max out on her daily surfing expenses. For the heavy consumer, a subscription with a fixed monthly fee may be beneficial, but even those subscriptions will cost about 5000NOK a year. Even with a monthly subscription the pricing of the service is unpredictable once you travel abroad.

In fact, much of the mobile surfing is not actually performed with the user typing a desired URL into her mobile browser at all. Most novice users explore the mobile web via *portals*, by navigating the hyperlinks made available through these portals. Telenor's portal, 'Entry', is by far the most significant one. Last year, the Internet branch within the Federation of Norwegian Media Companies² (FNMC), representing a total of 147 content providers, declared that they would discontinue their provision of content for the mobile telecom operators' portals, effective from March 1st 2008. In order to understand the underlying motivation behind the declaration, three things must be considered:

- 1) In Norway, when you purchase a mobile phone, the mobile company's portal (e.g. 'Entry') is preprogrammed as your Internet start page.

² My translation (Nor. Mediebedriftenes Landsforening).

- 2) The process of changing the start page is cumbersome and therefore a rather unattractive alternative to the novice and intermediate users.
- 3) By sustaining the practice in 1) and 2), operators make additional revenue by promoting sales of *CPA-services* (explained below) on their portals, since traffic that certainly would have gone directly to the news mediators' own pages, goes through telecom operators' portals.

In response to FNMC's declaration, the operators have agreed to address the issue in 2). The signing of the formal agreement between mobile telecom operators and FNMC was recently postponed, and it is now due for signing during December this year. The technical solution is estimated to be in place and running by April 1st 2009. There is, in fact, one last easily accessible resort for finding information and services on the mobile web; alas, the mobile web search engine available from the mobile telecom operators' portals (i.e. 'Sesam') nearly exclusively returns an array of online news articles - non-mainstream or non-commercial content is thus difficult to retrieve on the Norwegian mobile web.

1.2.2 You pay for content

My description of the NMI has thus far been preoccupied with the consumption of data traffic using traditional Internet services (e.g. email and web). However, the Mobile Internet as it is defined here, also includes services that are more or less designed for consumption exclusively on mobile handheld devices (e.g. SMS, MMS, ringtones). In Norway, the CPA-platform is the most substantial infrastructure for facilitating provision and consumption of these particular mobile content services. The information made available through CPA-services is often available at lower prices or for free, on the Internet. Despite this fact, the availability of the content in a convenient format, easily consumed on mobile handheld devices, along with extensive marketing campaigns, has thus far produced a high demand and a consumer willingness to pay for the content³ - or the convenience. Services provided through the CPA-platform are based on a price model and a billing system that requires the consumer to pay a *premium*

³ Mobile phone ringtones are typically sold within the price range 15 NOK -30 NOK

charge for content, i.e. the SMS or MMS returned to the consumer's mobile phone costs more than the cost of a regular SMS/MMS. The revenue is split between the network operator and the content provider, typically favoring the network operator some 30 to 50 percent.

During the last few years, more bandwidth-demanding mobile multimedia services have emerged on the Norwegian mobile content market. Consumption of these services typically require a WAP-enabled device with 3G* data transfer speed and a media player supporting the 3GP* standard. Rubberduck Media Lab provides the technical backbone and interfaces for a variety of these services. Typically, the consumer subscribes to a predefined multimedia package (not unlike the packages offered by cable-TV or satellite-TV companies), which offers access to streaming of television broadcasts (Mobil-TV), video clips and other multimedia streams. In addition to a fixed monthly fee, ranging from about 50NOK to 100NOK, the subscriber may have to pay an additional charge, set by the content provider, for each video stream she chooses to download. TV-broadcasts may also be charged by the minute. Rubberduck Media Lab hosts the mobile multimedia content on their own servers, and through formal arrangements with Norwegian telecom operators the traffic from their servers to the end consumers' handheld devices is *white listed*. This means that instead of the telecom operator charging the consumer for the data traffic, a predefined billing or a subscription is associated with the service. The customer gets an affordable service, as opposed to being charged for the actual traffic consumption, while additional revenue is created for telecom operators and content providers through the new emerging market. Obviously, these services are not available under the same conditions abroad, as the server traffic has not been white listed with foreign mobile telecom operators.

Some content providers i.e. news mediators and television broadcasters (e.g. VG, Dagbladet, NRK, TV2, TVNorge) hire the application developer, in this case Rubberduck Media Lab, for hosting multimedia content (typically small video clips) so that it can be consumed freely by users visiting the content provider's mobile web pages via traditional Internet connections (i.e. WLAN* access points), thus serving as an additional treat for their mobile web visitors.

1.2.3 What on Earth is the Norwegian Mobile Internet anyway?

Today, there exist no worldwide roaming agreements between mobile telecom operators. Differing national laws and regulations, along with telecom operators' conflicting interests, suggest that such an agreement belongs to the distant future. The lack of such an agreement has produced some of the most confusing and obscure pricing schemes in modern international telecommunication history, which in turn has caused some rather tragic circumstances for uninformed travelling users of the Mobile Internet.

The unlucky Swedish tourist Kristoffer Sandberg was obliged to pay 44.000 NOK after downloading and watching youtube-movies via Telenor's 3G-network in Norway (Computerworld, Oct. 14th 2008). Similarly, Dagsavisen (Oct. 14th 2008) could report of a Norwegian tourist receiving a telephone bill with the astounding charge of 160.000 NOK, after one week of Mobile Internet service consumption abroad. These horrific examples do to some extent illustrate the national borders of the Mobile Internet. Admittedly, it could very well be argued that the data traffic mentioned in these examples was not intended for actual consumption on small screened handheld devices, bearing in mind the mobile phones modem like functionalities⁴. The extreme cases presented here were, however, chosen for purpose of illustration.

In order to produce any sound arguments about whether or not the NMI is at a halt and what factors might be involved in causing such a halt, it is crucial to establish a common understanding of the term "Mobile Internet". It has occurred to me, during my investigations, that the notion of a Mobile Internet is ill-defined yet in widespread use. As part of my reflections in chapter five, I will address the perceived ambiguity with the term more thoroughly.

Within Information Systems (IS*) research, the term Mobile Internet has been defined in a somewhat consistent manner. Kim et al. (2002) state that the Mobile Internet: "is the use of the Internet via hand-held devices such as mobile phones or personal digital assistants". Similarly, Hanseth and Nielsen (2007) suggest that it stands for "high level services based

⁴See the NetCom *Connect*-subscription mentioned earlier in this section.

on mobile telecommunication technologies". In this thesis, the Mobile Internet refers to the ever growing array of high level services traditionally associated with the Internet, as they are made available for consumption on small screened handheld devices (i.e. mobile phones, PDAs, smart phones and similar hybrids) via mobile telecommunication networks. This suggests that the high level services available through the CPA-platform are a part of the Mobile Internet, while Internet use on a handheld device via a WLAN connection, is not. The reason for this deliberate distinction stems from a concern with the nation-wide availability of the same services under the same terms and conditions, as will be elaborated on both in section 2.1 and in section 5.1.

1.2.4 The role(s) of a mobile telecom operator; Telenor

In the case of Norwegian mobile telephony the first sign of open market competition was introduced in 1993, when the company NetCom GSM was formed. The following year both NetCom and Telenor independently engaged in the construction of their GSM* networks. The monopoly on fixed line telephony services was not lifted until 1998. Today Telenor is the leading mobile telecommunications company in Norway and the world's 7th largest mobile telecom operator, with 143 million mobile subscriptions per Q4 2007 (Telenor, Oct. 10th 2008). Telenor is engaged in providing mobile telephony services, wire based telephony and broadband access services, as well as being the Nordic markets largest provider of television services via cable and satellite.

Here at home, Telenor is currently engaged in constructing a *Turbo-3G* network. NetCom is doing exactly the same. The Turbo-3G upgrade provides broadband-like data transfers speed over the mobile network, and is approximately 10 times faster than regular 3G networks.

In terms of organizational structure Telenor is best described as what Henry Mintzberg (1983) has labeled *divisionalized form*; typified by old age, a huge workforce and a wide range of inter-organizational interests. During our interview, Erik Saastad from Dagbladet applied the metaphor of an onion when referring to Telenor's organizational structure:

"Telenor is like an onion, and the nature of the response you get from Telenor depends a great deal on what layer of the onion you are trying to communicate with (not exact quote)".

The fact that Telenor is a large and cutting edge pioneer in many of its endeavors, combined with the organizations widespread area of commercial interest in digital technologies and services, makes it an essential and powerful actor in the ongoing process of digitalization. The effects of the Digital Revolution is best described by the word; *convergence*. Gisle Hannemyr (2005: 141) points out that in our modern times the term convergence is frequently drawn upon to describe the ongoing digitalization of different forms of information and communication technologies. In the sense that, formerly distinct and separated forms and means of communication and information sharing (e.g. private letters, news papers, books, records, video and telephony) are now distributed over the same networks in digital form. Telenor acts at many of the intersection points and crossroads caused by the Digital Revolution and the alignments the company makes towards one technology or standard might depend greatly on how deeply the company is engaged in providing revenue making services for another and partly competing technology or standard.

The ins and outs of the Mobile Internet is not only influenced by the vast amount of inter-related actors involved in providing mobile telecommunication networks and mobile telecommunication services per se, but also by all the actors involved in developing and providing traditional Internet services (e.g. Google, Amazon, Yahoo, and Microsoft). The convergence caused by the digital revolution is indeed opening the doors for the integration of the whole mobile telecom 'world' into the Internet itself. Along with the rather speedy progression of the digital revolution comes a tremendous amount of complexity as a huge variety of actors with completely different strategies are trying to position themselves in the emerging markets and prepare for as well as trigger change.

From a mobile network provider's perspective, change needs be controlled, in the sense that it should have as few unknown and unwanted ripple effects as possible. At the same time, flexibility for change must be seen as a competitive

advantage. In the early 1990-ies, when NetCom announced their plans to build a GSM network in Norway, Telenor was ready to swiftly engage in a similar project. In October 2007 NetCom announced their plans to build Turbo-3G networks. This year we have witnessed both companies rushing to build their Turbo-3G networks in Norway.

2 THEORY

In this chapter, I introduce and discuss the concepts that provide the theoretical foundations of the thesis, as well as point out how they relate to Critical (Social) Theory. In section 2.1 I will briefly touch upon how the open end-to-end architecture of the Internet has traditionally been recognized for its democratizing potential, and how this potential is now widely perceived, among scholars from various disciplines, as being severely threatened. I will also relate these concerns to the traditional architecture of the mobile telecommunication networks.

Section 2.2 gives a brief introduction to Habermasian concerns for collective liberation through the cultivation of a public sphere. In section 2.3, I will illustrate how the democratizing potential of the (Mobile) Internet may be realized through the cultivation of a 'networked public sphere', and how the cultivation is facilitated by the (peer) production and disclosure of information and points of view, which can be built upon, filtered and synthesized by a large, varied and uncoordinated audience. Furthermore (in section 2.4), I will point to how our postmodern project based lifestyle demands attention to more individualistic emancipatory concerns, like the ease of internalization and application of information, by the individual in her local context.

In section 2.5 I will introduce Zittrain's conceptual framework, *generativity*, as a useful tool for analyzing and describing the level of innovation, development and adoption of high level services based on mobile telecommunication technologies. Finally, in the last section of this chapter, I will introduce a limited set of concepts from Actor Network Theory, that I find useful in describing the complex network of inter-related actors who influence, cultivate and shape the NMI.

2.1 End-to-end architecture

Initially, the Internet was designed with an open end-to-end architecture, a definition that was originally phrased by Saltzer et al (1984). The significance of the end-to-end principle, to the success of the Internet, has also been stressed by historian Janet Abbate (1999). Since the turn of the century, we have witnessed the growth of a strong academic critique, addressing the fact that Internet access through broadband cable has gained more and more prominence. The critique is based on the idea that the cable broadband architecture can more easily be manipulated to deviate from the neutral end-to-end architecture of the traditional Internet. One of the front figures in this critique is the law scholar, credited as one of the founding fathers of the Creative Commons⁵ movement, Lawrence Lessig. He explains how the end-to-end architecture was formerly protected by United States law and regulations, in the sense that traditional telephone service was regulated as common carriers* (Lessig, 2004). The new broadband cable services are commonly regulated as *information carriers*. With this shift in regulation the Internet Service Providers (ISPs) are no longer required by law to carry all Internet traffic indiscriminately.

The fact that all telecom services in Norway used to be provided through a monopoly has in turn lead to strong governmental regulations, following the discontinuation of the monopoly. 'Teleloven' was introduced in 1995 and was effective until it was replaced by The Electronic Communications Act (Nor. Ekomloven) in 2003. The Norwegian Post and Telecommunications Authority (NPTA, Nor. Post- og teletilsynet) functions as a watchdog to uphold The Electronic Communications Act. NTPA is complemented by The Norwegian Competition Authority (NCA, Nor. Konkurransetilsynet) whose responsibility is to facilitate fair competition in the Norwegian markets, with the safeguarding of consumer interests as its paramount objective. From an unofficial⁶ web published

⁵ *Creative Commons*; is a non-profit initiative promoting alternative Copyright Licenses that allows people to legally share and build upon the creative works of others.

⁶ "The unofficial translation from Norwegian is for purpose of information only. Legal authenticity remains with the original Norwegian version (original disclaimer)."

English translation of The Electronic Communications Act the following purpose statement can be retrieved:

"The purpose of the Act is to secure good, reasonably priced and future-oriented electronic communications services for the users *throughout the country* through efficient use of society's resources by facilitating sustainable competition, as well as fostering industrial development and *innovation* (Post- og teletilsynet, Nov. 22nd 2008, my emphasis)".

The growing public awareness of the socio-political potential embedded in the Internet, was remarkably apparent when Telenor announced their plan to disconnect from Norway Internet eXchange* (NIX), effective of July 1st 2007. The announcement received wide media coverage, and the public response culminated into a large amount of comments in weblogs and online discussion groups expressing dismay and skepticism. Telenor went through with their initial plan, as NPTA, NCA and the general public learned to accept the organizations intentions as being related to Quality of Service* (QOS), network security and network stability, with no ulterior motives jeopardizing the status quo in terms of Network Neutrality*. However, the increasing demand for QOS, on the Internet, is a threat to Network Neutrality in its own right, as David (2005) observes. He suggests that the success of the Internet is due to the intelligence being located in the *fringes* and not in the network. Better QOS is naturally implemented by means of increased intelligence in the network.

The mobile telecom industry has traditionally been characterized by intelligence situated in the network. Recently, we have witnessed the introduction of more powerful and 'intelligent' handheld devices (e.g. iPhone), providing improved user friendliness for a wide range of tasks. The iPhone has produced an extraordinary increase in Mobile Internet use among its owners, so much so, that many Norwegian Internet companies now provide dedicated iPhone versions of their websites. In section 2.3 the importance of intelligence located in the fringes is elaborated on, by introducing Benkler's arguments regarding the 'programmability of terminals'. But first, I will take a detour and introduce Habermas' historical observations of the (Bourgeoisie) Public Sphere and his concerns for its cultivation.

2.2 Habermas and the cultivation of a public sphere

Democracy; is government by the people, and government by the people is something more than periodic elections. Government by the people traditionally also involves the people enforcing a certain degree of control over their representatives, through reasoned discourse and scrutiny, based on freedom of speech and free access to information. These assumptions are as old as the idea of a democracy itself, and they are for instance dealt with by Plato in the Republic⁷.

During the eighteenth century we saw the rise of an autonomous public that was able to shape its own opinion. The printing press provided the public with newspapers and books, which lead to growing rates of literacy, and enabled the educated classes to engage in reasoned and informed face-to-face conversations over political issues and topics of public concern. The streets, the salons, the coffee houses and the town halls turned into arenas of debate and public will formation, and what Habermas has later termed *the Bourgeois Public Sphere* was established. Habermas describes the idea of a public sphere as such:

"a network for communicating information and points of view (i.e., opinions expressing affirmative or negative attitudes)"; which, in the process of communicating this information and these points of view, filters and synthesizes them "in such a way that they coalesce into bundles of topically specified public opinions (Habermas 1996 in Benkler 2006: 193, my emphasis)."

However, the mass media that at one point was able to contribute to the Enlightenment movement, and the cultivation of a liberal public sphere, had by the end of the nineteenth century begun to contribute to what Habermas has characterized as the 'decline of the public sphere'. According to Habermas (1989: 176):

⁷ *The Republic*; is a Socratic dialogue by Plato, written in approximately 360 BC. It is a highly influential work of philosophy and political theory.

the "public was largely relieved of" its tasks "by other institutions: on the one hand associations in which collectively organized private interests directly attempted to take on the form of political agency; on the other hand by parties which, fused with the organs of public authority, established themselves, as it were, *above* the public whose instruments they once were" (original emphasis).

Habermas suggests that the public sphere has declined due to the strong influence of money and power. Private interests made their way into political roles and agendas, while powerful corporations came to increasingly influence the state and the mass media. Citizens gradually turned towards dedicating their attention to consumption and private concerns rather than to issues of political and public concern. Today, the campaigns and the procedures associated with the elections of our political representatives have turned into mere routines (i.e. opinion polls and media experts), and as Larry Lessig points out, the outcome of the elections depends greatly on the experts who have turned these routines into a profession (Lessig 2005:41-42).

When we see the cultivation of a public sphere, through rational discourse, arguments and dialogue, as the fundamental prerequisites for a functioning democracy, a huge responsibility is left in the hands of the network operators, device manufacturers and information systems developers who actively shape, influence and cultivate the new arenas of public will formation of today. USENET discussion groups, mailing lists, weblogs, online communities and instant messaging services are all high level services available through the Internet. These high level services are arguably inheriting the roles of the old salons, coffee houses and town halls of the eighteenth century, in terms of sheer democratizing potential.

2.3 "The networked public sphere"

Yochai Benkler takes the argument about the democratizing potential of an open end-to-end architecture and intelligence located in the fringes one step further, by stressing the importance of the programmability of the end points (terminals). He makes a distinction between programmable devices and *appliances*, where appliances are devices pre-programmed to assist the consumer in a set of well defined tasks without much flexibility for adaptation into new usage areas (Benkler 2006:126). In terms of programmability the desktop computers and portable laptops connected to the Internet can be seen in stark contrast to the devices traditionally associated with consumption of mobile telecommunication services.

Triggered by the tremendous amount of people connected to the open end-to-end 'information highway', via programmable computers, it can be argued that a whole new social configuration is starting to take place. The overall democratizing effect of the Internet, as Benkler sees it, is caused by the rise of a new social model - based on ideas of cooperation, sharing and a peer production mentality. Benkler suggests that a new platform for the cultivation of a public sphere is emerging on the Internet:

"The Internet as a technology, and the networked information economy as an organizational and social model of information and cultural production, promise the emergence of a substantial alternative platform for the public sphere. The networked public sphere, as it is currently developing, suggests that it will have no obvious points of control or exertion of influence - either by fiat or by purchase. It seems to invert the mass-media model in that it is driven heavily by what dense clusters of users find intensely interesting and engaging, rather than by what large swathes of them find mildly interesting on average. And it promises to offer a platform for engaged citizens to cooperate and provide observations and opinions, and to serve as a watchdog over society on a peer-production model (ibid: 177)".

It needs to be mentioned, that the democratizing potential of the Internet has been questioned by a range of scholars, regardless of its end-to-end architecture, the intelligence located in the fringes or the programmability of terminals. In his book *republic.com*, Cass Sunstein presents two vital concepts to this critique; *information overload* and *group polarization* (Sunstein, 2001).

Information overload simply refers to the presence of too many available topics to submerge into and too many viewpoints to take into consideration. According to Sunstein filtering information and engaging in selected topics of discourse appears to be the only viable solutions for dealing with the overwhelming amount of choices online (ibid: 56-62). Furthermore he assumes that individual information filtering will be based on personal preferences (ibid: 112-115). When everyone connected to the Internet constantly filter information, and spend less time watching TV, listening to the radio or reading the newspaper, the traditional function of the mass media as the main facilitator of public will formation is thoroughly undermined. When it comes to addressing online political discourse Sunsteins argument is quite similar but somewhat more intricate.

Group polarization is the name of the documented effect occurring when like-minded people engage in discourse about a given topic over time. The effect is caused by social influence among group members and a limited set of arguments (ibid: 56-69). Sunstein suggest that the most extreme imaginable consequence of extensive group polarization would be a fragmentation of society (ibid: 71-75). People divided into smaller groups would make conversations on selected topics of interest, while ignoring the opinions uttered in other communities. The outcome would be a society characterized by limited understanding between the groups and a reduced potential for coming together and solving larger problems that humankind would need to deal with as a whole (e.g. nuclear crisis, global warming, world wars, terror and an increasingly unstable global economy). As Beck (1992) has pointed out our modern 'risk societies' are indeed characterized by an increasing number of conflicts of a global magnitude.

The critique regarding the democratizing potential of the Internet, briefly mentioned above, has already been thoroughly addressed by Benkler (2006). One of his main counter-arguments is that online peer production based communities, are in fact developing techniques and strategies to deal with information overload, and the side-effects associated with it. One such strategy widely adopted in online communities, be it hosted by commercial interests or non-profit, is to let the users vote or comment on material submitted by other users, along with the ability to vote or comment on already posted comments and votes. These strategies support a comprehensive peer production model, of relevance and accreditation, which culminates into a rather natural selection of valuable information and points of view. It could then be argued that the peer production model, supported by the right technologies and tools, may effectively compete with the mass media in its public will forming potential - a lot of peers are able to locate and access the same relevant and widely accredited information. These are the kind of technologies and tools I have in mind, when I argue for the deliberate cultivation of the NMI. In addition, I suggest that our postmodern lifestyles require yet another array of liberating tools, which I will present in the following.

2.4 Postmodern lifestyles and self liberation

The true end points of our communication and information sharing networks are indeed individual human beings - the atomic units of our democracies. The Internet has practically demolished the space-time barriers, which in turn facilitates information sharing and communication between incomprehensible amounts of people, from all corners of the world.

In the following I will review some noteworthy academic and philosophical reflections on how these historically unmatched possibilities, for individual exploration and experimentation, has opened the doors for the *construction* of new and more flexible personal *identities*. Sherry Turkle (1995) is arguably one of the most significant early explorers of the construction of identities on the Internet. Her interview based studies describes how people take on new identities to explore their own personalities. On the Internet, she says:

"we are encouraged to think of ourselves as fluid, emergent, decentralized, multiplicitous, flexible, and ever in process." Thus "the Internet has become a significant social laboratory for experimenting with the constructions and reconstructions of self that characterize postmodern life (Turkle 1995: 180, 263-264 in Spinoza et al 1997: 11-12)."

She suggests that participation in online communities facilitates experimenting with different selves, simply because experimentation on the Internet does not normally have substantial negative consequences. For example sex on the Internet does not lead to pregnancy or AIDS. Spinoza et al. put these early observations, made by Sherry Turkle, into a broader context in their philosophical investigation into postmodern life-styles and contemporary society (Spinoza et al., 1997). They point out that today people are shying away from life plans, or if we have life plans we include a great deal of room for changing our commitments. The authors state that:

"We no longer expect careers, employers, spouses or *communities* to remain constant throughout our lives. More and more, we give up trying to arrange relations among our various roles as spouse, parent, employer, employee, friend, and so forth in order to achieve a sense of integrity or overall purpose (ibid: 10, my emphasis)."

The project based postmodern lifestyle could even be seen in contrast to Sunstein's fear of a society fragmented by excessive group polarization. As we are becoming more experimental and project based in our endeavors the threshold for jumping from one interest based community to another - plunging into a completely new world of ideas, philosophies and opinions - becomes notably lowered.

Michel Foucault portrayed a rather different view on emancipation, than Habermas. He suggested that power can sometimes manifest itself positively by producing knowledge, that can be internalized and subsequently assist the individual in developing self liberating techniques or 'technologies of the self'. He distinguished these self liberating techniques from 'technologies of power':

"technologies of power, which determine the conduct of individuals and submit them to certain ends or domination, an objectivizing of the subject;
technologies of the self, which permit individuals to effect by their own means, or with the help of others, a certain number of operations on their own bodies and souls, thoughts, conducts, and way of being, so as to *transform* themselves in order to attain a certain state of happiness, purity, wisdom, perfection or immortality (Foucault, 1997: 224-225, my emphasis)."

Brocklesby, Cummings et al. (1995) suggests that from a Foucauldian perspective, tools of emancipatory value should make visible the hidden ways in which the individual is constrained by power, and assist the individual in developing personal empowering strategies in response. Arguably, they are suggesting a rather individualistic version of critical (social) theory.

Foucault's faith in the individual as a critical thinker undermines the role of the expert thinker, social researcher and analyst. At the same time responsibility is transferred into the hands of the toolmakers, developers and designers. Their task is to create tools with self liberating features, for the individual to apply in her local context.

Within the IS field this suggest the development and design of information systems, communication networks, applications and services that supports the easy retrieval, manipulation and synthesizing of information, as to assist the individual in creating internalized knowledge and developing self liberating techniques or 'technologies of the self'. As Shelly Turkle observes, the PC and the open end-to-end Internet, has become exactly such a tool for liberation and transformation of the self. Tools with self liberating features should obviously be seen in contrast to tools that are designed to dictate a certain way of conduct, in order to produce certain effects and avert certain undesired ones - much like Benkler's distinction between programmable devices and appliances. In the following sections, I will introduce two conceptual frameworks, which will be applied in my analysis of the NMI; generativity and Actor-Network Theory.

2.5 Generativity

The concept of generativity was coined by Jonathan Zittrain (2006). He observes that the PC and the Internet, in conjunction, have produced a paradigm example of what he calls a generative technology. In his own words:

Generativity "denotes a technology's overall capacity to produce unprompted change driven by large, varied, and uncoordinated audiences" (ibid., p. 1980).

Zittrain fleshes out the concept of generativity in more detail by dividing it into four more tangible and observable criteria; *the capacity for leverage across a range of tasks, adaptability to a range of different tasks, ease of mastery, and accessibility.*

Capacity for Leverage "describes the extent to which" tools and technologies "enable valuable accomplishments that otherwise would be either impossible or not worth the effort to achieve."

"Adaptability refers to both the breadth of a technology's use without change and the readiness with which it might be modified to broaden its range of uses." "Adaptability in a tool better permits leverage for previously unforeseen purposes."

"A technology's ease of mastery reflects how easy it is for broad audiences both to adopt and to adapt it: how much skill is necessary to make use of its leverage for tasks they care about, regardless of whether the technology was designed with those tasks in mind."

"Accessibility – [t]he more readily people can come to use and control a technology, along with what information might be required to master it, the more accessible the technology is."

By fleshing out the concept of generativity, Zittrain attempts to explain the success and level of innovation furthered by the grid of PCs connected to the Internet. He also suggests that these four criteria produce a conceptual framework for describing and analyzing the generative capacity of "any" given technology. Moreover, he suggests that: "[c]onsumers

deciding between security-flawed generative PCs and safer but more limited information appliances (or appliancized PCs) may consistently undervalue the benefits of future innovation (and therefore of generative PCs) (ibid: 2021)", and thus undermine the generative capacity of the Internet-PC grid with their choices.

Zittrain's work suggests an emphasized focus on 'the big picture'. As communication and information sharing networks, devices and applications are so interconnected and interdependent in today's technologies, a strict focus on only one aspect, or principle (e.g. network neutrality, end-to-end, programmability of terminals) is unfruitful. The total generative capacity may simply be severely hampered through the alternation or regulation of another part of the technology. For the purpose of addressing 'the big picture' he suggests the conceptual framework generativity as a useful tool or framework.

By analyzing other large device-network grids, distinctly similar to the Internet-PC grid (i.e. the Mobile Internet), in terms of their generative capacity, I suggest that the critical researcher may find assistance in unveiling and describing the ways in which the given device-network grid may also be constraining or disempowering. The concept of generativity may assist the researcher in structuring the analysis, in order to adhere to more than just one design principle, more than one aspect of the device-network grid and more than one source of domination. Finally, Zittrain's conceptual framework offers four rather precise and accurate success criteria, which may assist the critical researcher in developing liberating change strategies. In chapter four (Analysis), I will apply Zittrain's conceptual framework, derived from examining the grid of PCs connected to the Internet, to the grid of handheld devices connected to the Norwegian mobile telecommunication networks.

2.6 Actor Network Theory

Actor Network Theory (ANT) was initially developed and applied at the Ecole des Mines in Paris (Callon, 1986; Latour, 1987). At first the application of the theory was concerned with the sociology of science, but recently a focus on technology has been incorporated (Latour, 1996). The developers are known to frequently revise or extend the concepts of the theory, also in response to critique e.g. Star (1991). Star's widely acclaimed critique fostered a stronger emphasis on power imbalances and marginalization, which in turn has caused later applications of the theory to relate more strongly to a critical social research perspective.

It could be argued that ANT is not really a theory at all, but rather a set of concepts, or a tool-kit, specifically designed to describe the process of order-making within socio-technical networks. By order-making it is here referred to the reaching of some kind of equilibrium, where heterogeneous *actants* (technological artifacts, humans, organizations, institutions, etc.) are *enrolled* into aligned actor-networks, by means of *translations*. It is important to note that the term actant thus include both human and non-human actors, and does not distinguish between them. Here, I will only explain a few concepts, strictly relevant to my analysis, that have remained relatively stable during the last decade or so: *inscription* (Akrich 1992, Akrich and Latour 1992), *translation* (Callon 1991, Latour 1987) and *obligatory passage point* (Callon, 1986). For a more extensive introduction to ANT-concepts see Law (1992).

Inscription refers to the way tools or technical artifacts embody or dictate patterns of use - the hammer being a classic example of a tool with a strong inscription: "Technical objects thus simultaneously embody and measure a set of relations between heterogeneous elements" (Akrich 1992: 205, in Hanseth and Monteiro 1998). Hanseth and Monteiro further explain the concept:

"The term inscription might sound somewhat deterministic by suggesting that action is inscribed, grafted or hard wired into an artefact. This, however, is a misinterpretation. Balancing the tight rope between, on the one hand, an objectivistic stance where artefacts determine the use and, on the other hand, a subjectivistic stance holding that an artefact is always interpreted and appropriated flexibly, *the notion of inscription may be used to describe how concrete anticipations and restrictions of future patterns of use are involved in the development and use of technology* (my emphasis)."

According to ANT the point of equilibrium in aligned actor-networks is continuously negotiated through translations. The actors or *actants* in the network have different interests from the outset, and so the order-making process is determined by different actor's abilities to translate the interests of others' into their own. Somewhat stable networks of aligned interests are established through the *enrollment* of a sufficient body of allies, who are willing to participate in particular ways of reasoning and conduct that sustain the network.

Latour (1991) provides an illuminating illustration of these core concepts of actor network theory. A hotel management wishes to ensure that the hotel guests leave the keys at the front desk when leaving. The question then becomes. How is such a behavior to be inscribed and into what artifact? In Latour's example the management first attempts to inscribe behavior into a sign behind the counter, requesting all guests to return the key upon leaving. However, this inscription proved to be too weak. Their second strategy was to hire a manual door-keeper, but still the guests failed to leave their keys. Finally, management decided to inscribe the desired behavior into a metal knob, of some weight, attached to the key. By incrementally increasing the weight of the knob, the desired behavior was finally achieved. Hence, through a succession of translations, the hotel management's interests were finally inscribed into a network strong enough to impose the desired behavior on the hotel guests.

The reception desk becomes the obligatory passage point (OPP), in this story, as it is the only available service adhering to the guests' strengthened interests in safely abandoning the key. The notion of an OPP broadly refers to a situation that has to occur in order for all the involved actors to satisfy the interests that have been attributed to them by the focal actor, in Latour's story; the hotel management. The focal actor defines the OPP that the other actors must pass through and by which the focal actor, thus, "render itself indispensable" (Callon, 1986).

One of the most compelling features of ANT as a conceptual framework is its ability to cope with complexity. The theory supports the practice of zooming in and out, collapsing comprehensive actor-networks into simple actants, thus allowing for the description of order-making, at any level of abstraction, using the very same terminology. In my analysis (chapter four) I will apply a limited set of chosen ANT-concepts, introduced here, in describing the complex network of inter-related actors involved in the cultivation of the NMI.

3 METHODS

The work presented throughout this thesis draws heavily upon the consensus established within the paradigm of Critical (Social) Theory (CST) (Habermas, 1971, 1989 and Held, 1980). Within the IS field a wide range of publications draw upon a critical social perspective (Markus 1983, Hirschheim and Klein 1994, Myers and Young 1997). In the following section I will give a very brief introduction to CST and its implications for our understanding of knowledge and research - IS research in particular. In section 3.2 I will elaborate on my choice of conceptual frameworks and research methods as well as explain how my research was conducted.

3.1 Democracy and emancipation as the aims and goals of science

During the late 1960s, the German philosopher and front figure of the Frankfurt school of critical theory Jürgen Habermas developed *the Theory of Different Knowledge Interests* (Habermas 1971, Finlayson 2005:18). The publication of the theory led to a widespread discussion about the aims and goals of science. In his work, Habermas makes a clear distinction between three different interests that motivates the human quests for knowledge; technology, understanding and *emancipation*. In their philosophical work on IS research and IS design Bo Dahlbom and Lars Mathiassen refer to the work of Habermas, when pointing out that:

“Until our societies become democratic, until values such as liberty, equality and justice are realized, the aim of social research can only be to promote these values, and its interest has to be *emancipation*. Rather than collecting regularities for the purpose of control, we must *analyze the regularities* to determine whether they are oppressive or not, legitimate or illegitimate from a democratic perspective. Rather than developing a common understanding of society, we must analyze the common understanding of society, the ruling ideology, and criticize its oppressive components (Dahlbom, Mathiassen 1993:188, my emphasis).”

The underlying assumption, within CST, is that social reality is historically constructed, and it is the task of the researcher to uncover the different constraints and regularities produced by various forms of social, cultural, political and technological domination. I will, in accordance with Dahlbom & Mathiassen (1993: 247), suggest that the interest of the critical IS researcher is to investigate the political qualities of our technologies and illuminate the way technologies control and determine our lives. Phrased differently, the task of the critical IS researcher is to liberate people from the power of *technological determinism*. See Hughes (1987) and Winner (1977) for an introduction to technological determinism. Furthermore, the task of the critical researcher is pro-active in its struggle to produce actual change, as opposed to traditional research where the aims and goals are heavily fixed on contributing to the ever growing database of 'objective' knowledge. The pro-active task of the critical IS researcher is then to produce reflections on how we can design technologies to make our personal lives richer and more rewarding and our societies more democratic.

3.2 Gathering and interpreting data

Besides epistemological considerations, the very nature of my domain of interest, and the short time available for gathering and interpreting data, have set strong premises for my work. At the outset, I had a limited understanding for the domain of interest. I was able to define the aims of my inquiry more clearly, as I gained more knowledge, through an empirical case study approach (Yin 1993). In accordance with most critical research, my work is of a highly interpretative nature (Orlikowski and Baroudi, 1991; Walsham, 1995).

For the analysis of the large grid of handheld devices connected to the Norwegian mobile telecommunication networks, I have chosen to apply Zittrain's conceptual framework; generativity. By applying the framework to the case of the (Norwegian) Mobile Internet, I have conducted a comparison study between the NMI and the Internet-PC grid, considering the fact that Zittrain's framework has been derived from examining the Internet-PC grid. The underlying assumption that makes such a comparison fruitful, from a critical research

perspective, lies in the perceived emancipatory potential of the traditional Internet - suggesting that it serves as the present ideal device-network grid. In my analysis, the NMIs capacity to spur the (peer) production and disclosure of information and points of view, which can be built upon, filtered and synthesized by a large varied and uncoordinated audience, has been emphasized. I have also emphasized more individualistic concerns, for instance the readiness by which information lends itself to internalization and application by the individual in her local context. For the description of the socio-technical aspects of the NMI, the involved actors and their alignments, I have found it useful to lend central concepts from Actor-Network Theory (ANT).

The data for this thesis was drawn from a great variety of sources which include:

- o Three forty-five minute interviews
- o Numerous official web resources (e.g. Telenor Nordic, Dagbladet, Rubberduck Media Lab, NTSTDF, NIX, etc.)
- o Two Norwegian laws (Ekomloven, Teleloven)
- o 1 Quarterly report (Telenor)
- o 1 Statistical bulletin
- o Numerous online news articles
- o Several weblogs
- o Several online debate forums
- o 1 USENET newsgroup
- o Several lecture slides
- o Several research notes

A consensus of public opinions on certain matters regarding the Norwegian (Mobile) Internet was gained through the scrutiny of online blogs, web forums, a USENET newsgroup and comments directly associated with online news articles. At an early stage of the data gathering process, I decided to write a set of imaginary Mobile Internet use case scenarios (narratives). They were initially developed as a means of preparation for the interviews, but they were also subsequently edited and adjusted in response to ideas presented during the interviews. In addition, they were meant as a tool for structuring my thoughts and realizing what the Mobile Internet is at present, and could be in the future. I found the narratives to be helpful in several ways:

- o for realizing what I actually wanted to find out more about
- o as a preparation for interviews
- o for building a shared understanding of what was the actual domain of interest during interviews
- o for dealing with ambiguities during interviews (i.e. the term Mobile Internet)

Also, by writing the narratives I realized in what areas my domain knowledge was severely restricted. The narratives are included in Appendix 3. For the collection of my main corpus of data, I have relied upon in-depth forty-five minute interviews with three key informants, Erik Saastad, Jan Øyvind Agedal and Espen Erikstad from Dagbladet, Telenor Nordic and Rubberduck Media Lab respectively. From the very beginning of my data gathering process, the roles of the telecom operators have been deliberately emphasized, due to their perceived level of control over complex technologies vital to the NMI.

3.2.1 Interviewing

The nature of the three Interviews ranged from completely unstructured (first interview) to semi-structured (last interview), as I was able to narrow down the scope of my research and develop more precise questions for each subsequent interview. Erik Saastad, representing the mobile department at Dagbladet, produced a lot of facts and figures during the first interview. From my experience with the first interview I decided to tape the two subsequent ones, simply because I realized that there were just too many actors, technologies, concepts, abbreviations and concerns regarding the cultivation of the NMI for me to fully comprehend everything whilst I was taking notes. In addition to responding to my questions during our Interview, Erik Saastad has been extremely helpful in providing subsequent clarifications via email. I found it useful to transcribe the two taped Interviews, in order to work with the information in a structured and organized manner, highlighting the information that I found important to my inquiry and discarding the information that I found to be outside the scope of my research. The interview transcripts can be found in Appendix 2.

4 ANALYSIS

I will structure my reasoning about the NMI by referring to two distinguishable branches of high level services; 'the mobile web' and the premium charged 'CPA-services', although, as we shall see, the two are strongly interlinked. In this analysis, the notion of a 'mobile web' refers to more than just the regular web made available on handheld devices; it potentially also refers to other traditional TCP/IP based services and technologies (e.g. email, FTP), traditionally supported by regular non-mobile web browsers. The following section is concerned with detailing the alignments between different actants involved in shaping and cultivating the NMI, while section 4.2 consists of my analysis of the NMI, in terms of its generative capacity. Finally, in section 4.3, I will, in the light of the preceding analysis, explore the NMI's emancipatory capabilities, and offer some modest implications for the deliberate cultivation of the NMI.

4.1 The Norwegian Mobile Internet and the actants involved

Let's start by examining the perceived interests of some of the actants involved in shaping and cultivating the NMI, along with the means they use and the alignments they make to achieve their goals. First, I will address the network of actants involved in shaping the Norwegian mobile web, next I will focus on conflicts and alignments related to the CPA-services, and finally, I will take into consideration some of the influential actants whose interests are not directly linked to the mobile web or the CPA-services per se.

4.1.1 Norwegian mobile web

Figure 1 depicts the socio-technical network of actants involved in cultivating the Norwegian mobile web, which, in turn, influence the way the mobile web is perceived by the end users. I use the word 'perceive', simply, because, at present, surfing the mobile web may not bear much of a resemblance to the more traditional World Wide Web experience on larger screens.

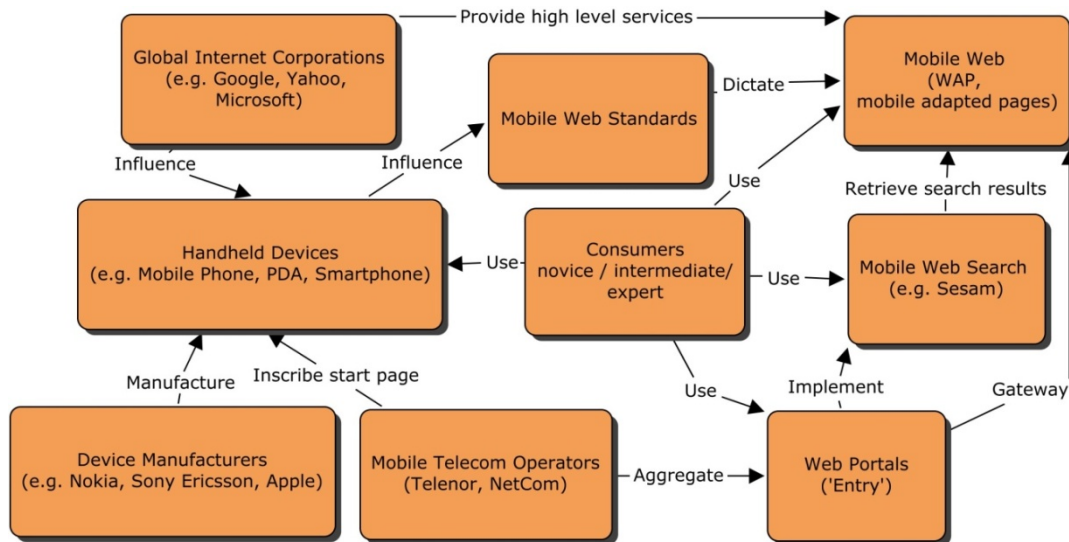


Figure 1; Actants influencing the Norwegian mobile web

Surfing the mobile web tends to start out at the telecom operators' start pages (e.g. 'Entry'), which are preprogrammed into the mobile devices. The preprogramming acts as a strong inscription as it is quite cumbersome to replace the start pages. In turn, the portals function as the Obligatory Passage Points (OPPs), through which the mobile web users may find the means to satisfy their online needs.

Unfortunately, only a limited set of services and resources can be reached effortlessly from the operators' portals, by following the variety of available links or submitting a query to the search engine (i.e. 'Sesam'). In turn, the search engine nearly exclusively returns hits from published online news articles. As mentioned earlier, there has been a strong incentive for the telecom operators to sustain the status quo in terms of traffic going through their portals, as visiting users are exposed to advertisements for the premium charged CPA-services. In fact, the portals are not only serving as OPP's for the end users, but also for the content providers. In order for the content providers to reach the mobile web users, advertisement on the operators' portals or a fully fledged advertizing campaign is required (advertizing on the regular web as well as offline advertizing). Three factors must be taken into consideration in order to recognize the dominant roles of the telecom operators' portals, in relation to the marketing of mobile services:

- 1) Norwegian mobile web users generally access the web via telecom operators' portals.
- 2) Mobile services need advertizing, as the consumer must typically be exposed to the new services in order to realize that she "needs" them.
- 3) The mobile web, unlike the traditional World Wide Web, does not yet have a substantial mass of users or mobile online communities, where more specific interest based mobile services may be advertized.

Both device manufacturers (e.g. Nokia, Sony Ericsson, Apple) and the large Internet corporations (e.g. Google, Yahoo, Microsoft) are developing strategies and technologies (e.g. iPhone, Android, Windows Mobile) to gain more influence over the end users. The design, the physical attributes, the operating systems and the applications running on the handheld devices do of course have a tremendous influence on end user habits, preferences and needs, as we have seen with the already mentioned 'iPod revolution' (section 2.1). The design and the physical attributes of the devices (e.g. screen size and resolution) also influence or dictate the standards for mobile content provision (e.g. mobile web standard), which we have also seen in the case of the iPhone. The use of the term standard is actually not misplaced here, as Internet companies favoring the iPhone in their mobile web designs may indeed force other device manufacturers to swiftly offer similar device capabilities, in order to retain customers.

4.1.2 CPA-services

Today, the telecom operators "own" the NMI users. The users subscribe with the operators in order to gain access to the mobile telecom networks, and client details are associated with the operators billing system. With the telecom operators turning around and offering billing services to the CPA* content providers, a wide range of services that would otherwise be unattractive or impossible to retail are made available for public consumption. As Hanseth and Nielsen points out: "The cost of adding the billing of content services to existing phone bills is marginal compared to the cost of content providers formalising new billing relationships and perform billing of small transactions (Hanseth & Nielsen, 2007)."

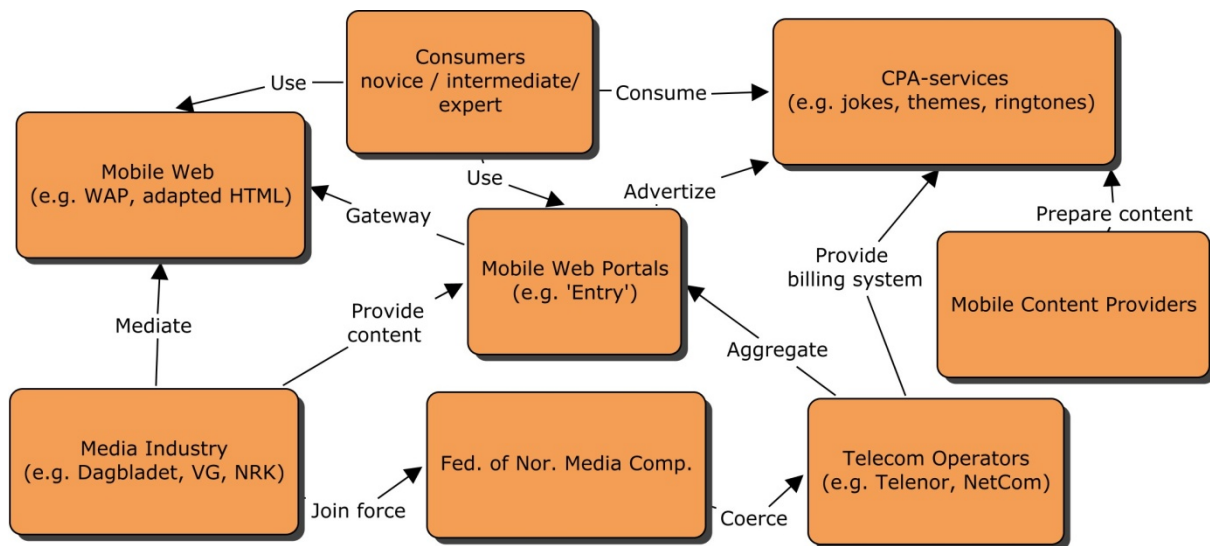


Figure 2; Actants influencing the CPA-services

The readily available billing system dictates certain ways of conduct for the content providers. The CPA-platform becomes the OPP for any content provision compatible with the CPA business model and standards. All other things being equal, it is impossible for a content provider to compete without tapping into the telecom operators' already established customer relations. *Figure 2* illustrates the socio-technical network of actants whose interests are related to the CPA-platform.

The success of the CPA-platform, and the practices endorsed by the telecom operators in order to sustain the income stream facilitated by the CPA-services, has produced some strong side effects. So strong, in fact, that a variety of media companies have decided to further change through the Federation of Norwegian Media Companies (FNMC). As mentioned earlier, the Internet branch within the FNMC has threatened to discontinue the provision of content, for the telecom operators' portals; unless, the strong inscriptions of the preprogrammed start pages are removed or lightened. FNMC argues that the preprogrammed start pages hamper the media industry's endeavors on the mobile web. For instance, offline advertizing campaigns for mediators' mobile web sites and web based services are rendered nearly useless, as the consumer going through the portal may just as easily visit the link of a competing mediator providing similar content. It could be argued that the only actant truly benefiting from the mediators offline advertizing campaigns would be the telecom

operators, as they would gain traffic through their portals either way.

The signing of the agreement between the FNMC and the telecom operators is due for December 2008, which will initiate the implementation of a technical solution. Today, there are several initiatives engaged in creating alternative mobile web portals, which are supposedly more open and obviously not as controlled by the telecom operators. Arguably, many users of the mobile web are not going to bother replacing the telecom operators' start pages until an alternative comes preinstalled with the mobile web browsers.

Up until now, it would seem as if the mobile telecom operators, by means of strong inscriptions, have managed to render themselves, in Michel Callon's terms, utterly "indispensable", not only in their roles as providers of the mobile telecom networks, but also when it comes to advertizing on the mobile web and in the provision of mobile content.

4.1.3 'The big picture' and external influences

The seemingly unavoidable merge between the 'world' of mobile telecommunication and the Internet has already been mentioned in relation to the ongoing digital revolution (section 1.2.4). Once again, the Apple iPhone may serve well as an example, with its ability to elegantly alternate between different providers for its data traffic consumption (e.g. telecom networks and available WLAN access points) (Figure 3). Also worth noticing is the Norwegian media industry's growing interest in providing multimedia content, which can be consumed freely by users visiting the content provider's mobile web pages via available wireless Internet connections (i.e. WLAN* access points).

Traditionally, the consumers of mobile services are used to paying for everything and the willingness to do so is quite extraordinary, bearing in mind that ringtones have been retailed for about 30NOK for a decade. As the surfing experience on the Mobile Internet grows more resembling to traditional Internet surfing, both in appearance and in functionality, consumers are going to expect the Mobile Internet to be available at an affordable fixed monthly price, not unlike the fixed line broadband subscriptions for their

homes. At the same time they are going to expect more services to be available for free, like they are on the traditional Internet.

The network upgrades, offering broadband like data transfer speed over the mobile telecom networks (e.g. Turbo-3G), are expensive investment that needs to produce substantial revenues for the network providers. Paradoxically, they are the kind of upgrades that makes it difficult to distinguish between the mobile telecom services that consumers are traditionally willing to pay for, and the Internet services that they are used to enjoy for free; mobile VoIP serving as a particularly prominent example.

In the case of the NMI, the mobile telecom operators' have been very successful at translating the interests of both content providers and end users, into their own. However, influences like the FNMC initiative and the capabilities of new handheld devices (e.g. WLAN readiness) suggest that also the mobile telecom operators may have to negotiate their interests, in the foreseeable future. In the following, I will show how the different interests and alignments, presented throughout this section also affect the generative capacity of the NMI. The influence of Norwegian laws and regulations, to the case of the NMI, will briefly be recognized in my reflections (section 5.1).

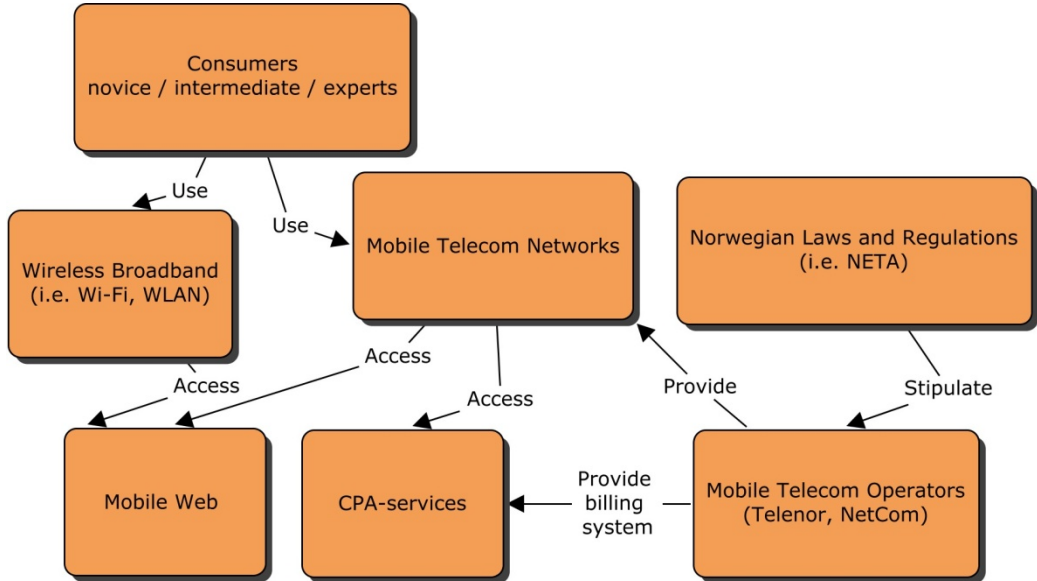


Figure 3; External influences to the NMI

4.2 The generative capacity of the Norwegian Mobile Internet

The analysis of NMIs generative capacity is structured as follows. First, I will explore both the mobile web and the CPA-services according to each of the four success criteria; capacity for leverage across a range of tasks, adaptability to a range of different tasks, ease of mastery, and accessibility. I will point to differences between the two distinguishable branches of services within the NMI, and also how they differ from the grid of PCs connected to the Internet. Finally, I will summarise my observations and address the generative capacity of the NMI as a whole.

4.2.1 Capacity for leverage across a range of tasks

Please, recall that: capacity for Leverage "describes the extent to which" tools and technologies "enable valuable accomplishments that otherwise would be either impossible or not worth the effort to achieve."

Leverage: CPA-services

As pointed out by Hanseth and Nielsen (2007), the CPA-services have created a potential for leverage, which simply does not exist on the traditional Internet. By breaking the end-to-end principle and including a billing system in the network, the telecom operators offer content providers new opportunities to provide services that otherwise would be unattractive or impossible to retail. However, the premium charge business model associated with the CPA-platform only leaves room for the distribution of content and information of a perceived commercial interest.

The CPA-services are effortlessly consumed on mobile handheld devices, typically initiated by the consumer sending an SMS with a service request to a four digit number - a practice that should be seen in contrast to the efforts of finding similar content on the Internet, downloading it and transferring it to the handheld device. The CPA-services have added something to the mobile experience, which wasn't there before - although mostly in terms of convenience.

Leverage: mobile web

The mobile web experience has traditionally been characterized by small screens, cumbersome navigation, and tedious means for providing input, along with low data transfer rates. These obvious shortcomings have made it difficult for content and service providers to offer anything but flat information services like news articles and weather forecasts. Today, we are witnessing the introduction of more user friendly devices, with larger screens and higher resolution - suggesting that the mobile representation of traditional Internet services (e.g. email, interactive web, instant messaging, and video streaming) will bear a stronger resemblance to their counterparts on larger screens. The use of such traditional high level Internet services may be facilitated through mobile web interfaces and robust server side logic, even if the devices themselves are somewhat applianceized or 'closed' e.g. iPhone (Tag, 2008).

The lack of a strong de facto standard for provision of mobile web content has made it difficult to produce accurate statistical bulletins depicting the data traffic consumption and the number of unique users surfing the mobile web via small screened handheld devices. The traffic that actually can be counted and measured, with accuracy, is the WAP traffic. As mentioned in section 1.2, the WAP traffic going through Norwegian mobile telecom networks has not increased at all during the last year. The lack of statistical bulletins or tangible facts and figures has made it difficult for content providers and the media industry to attract investors for their mobile web endeavors.

4.2.2 Adaptability to a range of different tasks

"Adaptability refers to both the breadth of a technology's use without change and the readiness with which it might be modified to broaden its range of uses." "Adaptability in a tool better permits leverage for previously unforeseen purposes."

Adaptability: CPA-services

Although, the CPA-platform enables the provision of services which otherwise would be hard or impossible to offer, it still suffers from a lack of adaptability into new usage areas. The

CPA-platform functions as a bridge that lets content providers push some of the content available on the Internet, or elsewhere, into the domain of mobile content services, while taking a small fee for their trouble. However, the CPA platform has hardly caused any innovation in terms of creating new and unique services that take advantage of the mobility and the increasingly high-tech attributes integrated in the handheld devices (e.g. camera, video recording, GPS, etc). Most CPA-services are arguably based on the assumption that handheld devices are primarily content consuming appliances. The CPA business model and the inclusion of the billing system in the network severely delimit the adaptability of the CPA infrastructure.

Adaptability: mobile web

The World Wide Web with all its currently established standards and technologies promises an enormous playground for corporate mobile service providers and creative commoners alike (e.g. mobile homepages and mobile weblogs). At the same time, the handheld devices are gaining more and more attributes and features, offering the user the means to create multimedia content that potentially can be shared with others or indeed whole mobile communities. I explore some of the mobile web's perceived adaptability in my 'imaginary Mobile Internet use case scenarios' (Appendix 3). It is important to note that the mobile web's adaptability is not characterized so much by the breadth of use at present, but rather by the readiness with which it might be modified to broaden its range of use, even into new and uncharted domains. Much of the unreleased potential of the Norwegian mobile web lies in the lack of a critical mass of users ready to adopt new web based mobile services, which should be seen in relation to the current constraints both in terms of ease of mastery and accessibility.

4.2.3 Ease of mastery

"A technology's ease of mastery reflects how easy it is for broad audiences both to adopt and to adapt it: how much skill is necessary to make use of its leverage for tasks they care about, regardless of whether the technology was designed with those tasks in mind."

Ease of mastery: CPA-services

The CPA-platform makes it easy for content providers to create interfaces for new service according to well defined standards. The customer relations are dealt with by the already available billing system. The marketing is equally easily handled through the operators' portals. However, the CPA-infrastructure is fairly inflexible, due to its devotion to content provision. It is designed and developed to enable a limited set of well defined tasks.

The CPA-services allow for easy retrieval and immediate consumption of the desired content by a broad audience, and the skill requirements for the end users are absolutely minimal. However, the CPA-services tend to dictate a certain way of conduct for the end user, and does not readily allow for the consumer to modify or apply the content or the services into new usage areas or contexts. Being exclusively an infrastructure for content distribution the CPA-platform does not provide services assisting the more advanced or expert mobile user in fulfilling more complex or non-standardized tasks.

Ease of mastery: mobile web

The lack of a strong de facto mobile web standard makes it difficult for small companies or commoners to produce mobile versions of their online resources. It could be argued that in order to make a full mobile online representation of your endeavours, several different mobile versions needs to be produced (e.g. WAP, iPhone-version, etc), which in turn requires a significant mobile web budget or a lot of spare time. Development for the mobile web requires additional software, mobile simulators, handheld devices and different mobile browsers for testing and debugging. In comparison, designing for the traditional World Wide Web can be done on a single private home computer with minimal software requirements.

The mobile web has so far been quite difficult to master, also for the user, at least compared to its desktop counterpart. In fact, a lot of mobile phone users may not even realize that their devices are capable of exploring the mobile web, the functionality sometimes being 'hidden' somewhere in an obscure and unexplored section of the mobile phone's menu system. For

those who actually do explore the web, their encounters tend to start out at the telecom operators' portals. As pointed out earlier it is quite cumbersome and difficult for the novice or intermediate consumer to find non-mainstream content and services by navigating from the preprogrammed start pages.

4.2.4 Accessibility

"Accessibility – [t]he more readily people can come to use and control a technology, along with what information might be required to master it, the more accessible the technology is."

Accessibility: CPA-services

Most CPA-services are supported by any new mobile phone, as well as a huge range of older devices. Due to the CPA infrastructure, appliancized handheld devices may readily facilitate the consumption of available content and services. The distribution of the content and the service comply with simple and widely supported mobile standards (e.g. SMS, MMS and WAP). In addition, the premium charged services are priced in a predictable manner within a price range that most consumers find affordable. Almost all users of mobile phones or similar handheld devices may potentially purchase CPA-services, without any cumbersome registration or sign-up fees. Anybody with a good business idea may set up and provide content services through the CPA-platform, as long as she does not break with a few simple guidelines or Norwegian laws and regulations. However, the cost of setting up a new service and connecting to the CPA infrastructure, along with the predefined revenue share model, may restrict content providers from distributing services via CPA.

Accessibility: mobile web

For the large media companies and mobile web content providers (e.g. Dagbladet, VG, NRK), advertizing and general content provision on the mobile web has been heavily restrained. The 'restrictions' are related to the mobile telecom operators' strong incentives to sustain the practice of having mobile web users going through their mobile web portals, as it exposes the visitors to advertisement for the CPA-services. The media industry and the mobile web content providers have thus been forced to provide content for the telecom operators' portals

in order to reach the end users. Obviously, only a limited set of content providers may be represented at the start pages, and so only the information and content perceived to have the utmost mainstream market value is given precedence, suggesting that smaller companies' or commoners' endeavors are excluded from the public eye. Even the mobile search engine, Sesam, is devoted to returning commercialized information from published online news articles. These circumstances obviously also affect the surfing experience for the end users, as does the obscure and unpredictable prices on data traffic consumption. The current pricing schemes make mobile web surfing and exploration far less accessible than its fixed line broadband counterpart. The fact that most people have daily access to large screened computers and fixed line broadband Internet, suggests that they will rather wait and satisfy their online needs in an environment with more predictable expenses.

Newer mobile devices (e.g. iPhone), with larger screens and better resolution, have produced a strong pull away from the delimiting WAP-standard(s), favoring stripped down versions of regular web pages instead. This suggests a move towards making all traditional web resources accessible, also for mobile explorers of the web.

In the next section I will summarize and discuss the findings of my analysis.

4.2.5 Summary

My observations suggests that the CPA-platform is characterized by a lack of adaptability, simply due to its dedication to content provision - content, which also has to be of a perceived mainstream market value. The content does not lend itself to easy modification or application in various contexts. Being a "one way" content distribution channel the CPA infrastructure does not let the consumer take advantage of the high-tech features built into newer handheld devices (e.g. camera, video, GPS).

The generative capacity of the mobile web, on the other hand, is primarily hampered by the lack of a strong and manageable de facto standard, making it complicated to provide and use mobile web resources. The lack of a strong de facto mobile web standard has also made it difficult to produce statistical bulletins describing the users' activities on the NMI, which in turn makes it difficult for the media industry and mobile web service providers to attract investors for their projects.

The mobile web accessibility is severely hampered, both for content providers and end users, due to the success and domination of the CPA infrastructure. In particular, this domination is apparent with the telecom operators' strong incentives to sustain the practice of preprogramming the mobile web start pages into the handheld devices, in a manner that does not allow for easy replacement. The dominant role of the telecom operators' portals has made it difficult for smaller mobile web content and service providers to reach the end users, which obviously delimits the range of readily available opportunities for the end user. The accessibility for the end user is also severely hampered due to unpredictable prices on mobile web surfing. The unpredictable prices need to be seen in relation to the lack of a strong de facto standard, forcing the end user to resort to gambling, in terms of bandwidth consumption, when exploring the mobile web outside the scope of the operators' portals.

The mobile web is, however, characterized by transition as well as imminent change. The most significant changes are related to the introduction of new and more user friendly handheld devices with larger screens and more efficient means for navigation and input. In addition, the mobile telecom networks are being upgraded to support broadband like data

transfer speed. *Diagram 1* summarizes my analysis of the generative capacity of the NMI. The 'CPA-services' and the 'mobile web' have been given relative values, ranging from one to three - represented by plus signs. The values denote their perceived generative capacities according to each of the four success criteria. A plus in brackets suggests that the generative capacity may be improved by the imminent changes mentioned throughout my analysis. However, the generative capacity of a given technology needs to be seen as a whole, and not only as four detached success criteria. When addressing the big picture of the NMI, I will suggest that the grid of handheld device connected to the mobile web is highly generative, imminent changes taken into consideration.

Zittrain propose an emphasized focus on: "understanding which platforms will remain open to third-party innovation and which will not (Zittrain 2006: 1979)." Considering the two branches of content and service provision examined here, 'the mobile web' or TCP/IP based technologies and standards are by far the most open for third party innovation and for realizing the communication and information sharing potential embedded in newer handheld devices. However, in order for this potential to be realized, change needs to be introduced. Relevant change has so far been controlled by telecom operators and device manufacturers. By introducing and maintaining technical solutions that facilitates control over both content providers and end users, the telecom operators have managed to remain in their roles as focal actors also in relation to content provision. In the next section, I will point to some change 'strategies' and their implications for the generative capacity of the NMI. I will also point out their implications for collective liberation through the cultivation of a public sphere, as well as individual self liberation through internalization and application of information in local contexts.

	CPA-services		Mobile Web	
Generativity	Content provider	End user	Content provider	End user
Leverage	++	++	+(+)	+(+)
Adaptability	+	+	++(+)	+(+)
Ease of Mastery	++	+	+(+)	+(+)
Accessibility	++	+++	+(++)	+(++)

Diagram 1; Generative capacity of the NMI

4.3 Generativity, change and liberation

The CPA-platform's lack of adaptability and its strict devotion to mainstream content provision obviously facilitate a one-to-many communication, or 5000-to-many - or as Benkler (2006) might phrase it; it is driven heavily by what large swathes of consumers find mildly interesting on average rather than what dense clusters of users find intensely interesting and engaging. The CPA-infrastructure does not allow for users to share their own content or even publicly comment on the content and information they obtain. The CPA information model suggests that we should rather think of the handheld devices and their users as detached islands with needs that can be accommodated in a standardized and well defined manner.

Considering the more individualistic and self liberating potential of the CPA-services, the available content and information does not lend itself to easy modification or application into new usage areas. In fact, the services tend to strongly dictate a certain way of conduct. Through the CPA infrastructure, information is retailed according to a premium charge model which allows the user to purchase an 'answer' to one of his current needs (e.g. a weather forecast, a traffic report or a phone number lookup) rather than a general 'solution' or actual knowledge, which can be modified and applied in new contexts. My further investigation into liberating change strategies are thus only indirectly concerned with the CPA-platform.

4.3.1 Liberating change strategies

Some of my suggestions for 'liberating change strategies' are merely observable changes being introduced to the NMI at present, described from a critical social perspective. The strategies presented here are either related to the lack of a strong de facto standard for presenting and retrieving mobile web content, the obscure and unpredictable prices on mobile data traffic consumption, or the dominant role of the CPA-infrastructure. A strong de fact standard is obviously not going to be established overnight, as the handheld devices are still only modestly developed to suit our mobile needs and dreams. A variety of initiatives may be embarked upon in order to cultivate the NMI during a period of transition.

User oriented search engine(s)

The search engine, Sesam, made available at the telecom operator's portals, nearly exclusively returns hits from published online news articles along with a few other results of commercial interests. In the interest of making the most information available to the whole mobile web 'public', I propose the introduction of a more open search engine at the operators' portals. Instead of categorizing and returning hits discriminately, as Sesam does now, the search engine could return all World Wide Web search results indiscriminately and provide the user with the tools needed for filtering the obtained search results herself - a tool for developing 'technologies of the self' or self liberating strategies. If the user is performing the search from a regular WAP browser she may be allowed to filter the returned search results through a 'WAP filter', if she uses an iPhone she may dictate the search engine to return all detectable stripped down HTML pages. People are used to finding information on the Internet through search engines. Effective and efficient search engines have been of immeasurable importance to the success of the World Wide Web. When all published information becomes publicly locatable, the incentive to become a publisher, or a contributor to an online community, increases substantially. Purposeful search engines assist the individual in collecting, filtering and generally dealing with enormous amounts of available data according to her current needs. The need for the introduction of a more open search engine, at the operators' portals, is based on the assumption that users are going to remain 'faithful' to the portals for an extended period of time. I will not deal with the introduction of alternative mobile web portals as a distinct change strategy, as the possibility has already been mentioned extensively earlier in my work. The emancipatory concerns related to the introduction of a substantial alternative to the operators' portals are fairly similar to the ones mentioned in relation to the search engine.

Measuring NMI data traffic

The issue related to measuring the mobile web data traffic and counting unique users on the mobile web is currently being addressed by TNS-gallup⁸. The lack of a strong de facto mobile

⁸ TNS Gallup is a service market research company specializing in brand tracking and media research.

web standard, the use of the mobile devices as modems for larger computers, and the fact that many mobile web users access regular web pages with their mobile browsers, has made it extremely difficult to measure the actual mobile web traffic consumption accurately. TNS-gallup recently had to acknowledge that they had failed to provide a correct picture of the activities on the mobile web, this time due to a difficulty with counting unique iPhone users. TNS-gallup has announced the publication of more accurate NMI statistics by the end of 2008. In turn, the investors and marketing specialists get figures and facts to work with.

More accurate measures of advertizing potential along with an increased incentive for investors may lead to the introduction of new services, that are unique to the Mobile Internet; services which actually take advantage of the resources and attributes built into the handheld devices. In turn, the general public may find more reasons to use the Mobile Internet and eventually gain enough substance to create new and innovative mobile communities.

More predictable data traffic pricing schemes

If the prices on mobile data traffic were more predictable and generally less costly, more users would be interested in using the NMI also for exploratory purposes, as opposed to following the collection of links made available at the operator's portals. In turn, this would help service providers and community builders in reaching critical masses of users for their non-mainstream mobile endeavors. With an affordable fixed price on Mobile Internet surfing more users would feel free to use the Internet also for sharing and contributing to mobile peer production, as opposed to simply diving into the Mobile Internet in order to solely retrieve information.

New multimedia services

The growing market for mobile multimedia services (e.g. streaming TV-broadcasts and video clips) has already been mentioned. These services are based on a business model quite similar to the CPA-model, and in fact, the new generation of CPA-services does incorporate multimedia services, like the streaming of music and video. The availability of these multimedia services may indeed contribute to further the cultivation of the NMI, as they create a new incentive for users to explore the NMI altogether. The inclusion of the

billing system in the network actually allows for the inversion of the traditional CPA-business model. The services are not based on a premium charged price model, but rather on a business model that lets the consumer pay less for the service than the 'cost' of the actual data traffic consumed. However, these services could eventually turn into premium charged services, much depending on the mobile telecom operators' future prices on data traffic. The new multimedia services could also eventually take over the rather conservative role of the more traditional CPA-services, as it is based on the idea of taking something that already exist on the traditional Internet, or elsewhere, and adapt it for effortless consumption on the Mobile Internet while charging a small fee. As we have seen this business model has contributed to the slow level of innovation in the case of the NMI, as the introduction of the billing system into the network, along with the split revenues between content providers and mobile telecom operators, has increased the incentives for telecom operators to control both content providers and consumers interests on the NMI.

In the next chapter I will present some of my reflections concerning the work I have done, and in the final chapter I will present the concluding remarks to my research.

5 REFLECTIONS

In the following sections I will present some of my thoughts concerning the work I have done, the frameworks I have adopted and some encountered challenges during my research endeavor.

5.1 Ambiguities with the term *Mobile Internet*

During my four months of investigating the Norwegian Mobile Internet I have come across a range of perceptions, opinions and definitions of what is the Mobile Internet. The most stinking ambiguity with the term is in the fact that surfing the Internet on a small screened device (i.e. mobile phone), and surfing the Internet on a laptop computer via a mobile modem (i.e. mobile phone), are both commonly referred to as using the "Mobile Internet" - as can be observed by referring to the following two news articles (digi.no, Aug. 27th 2008; Amobil.no, Dec 3rd 2008). Within IS research literature the term Mobile Internet commonly refers to the former of the two conditions, however, even the definitions in the IS literature tends to leave room for ambiguity. In section 2.1 I emphasized three criteria in my definition of the Mobile Internet:

- 1) high level services
- 2) made available on small screened handheld devices
- 3) via mobile telecommunication networks

The formerly cited Norwegian Telecommunications Act (section 2.1) suggests that in Norway we should have "good, reasonably priced and future-oriented electronic communications services for the users throughout the country". When describing and analyzing the Mobile Internet as a national phenomenon or indeed even a national public good, naturally, the services in mentioning needs to be readily available under the same terms and conditions for all Norwegians. Extensive WLAN coverage is restricted to the big cities - it does not offer substantial mobility and it is not available to the public as a whole. With new handheld devices (e.g. iPhone) being able to alternate between transferring data from the telecom networks in one second and open WLAN access points in the next, this notion of a Mobile Internet is, admittedly, getting more ambiguous and confusing.

5.2 Is Generativity a theory, a conceptual framework or both?

In my work, I have applied the conceptual framework of generativity to the case of the NMI. Zittrain's concept seems to be heavily inspired by and derived from studying one paradigm example of a generative technology; the grid of PCs connected to the Internet. It seemingly captures the success of the Internet, in four tangible criteria. When applied as an analytical framework to the analysis of other large scaled information and communications networks or device-network grids, it is possible to describe the given technology as either a success or a failure according to the four criteria. However, there is obviously no way for the researcher to actually falsify or test the relevance of the four criteria. How accurately do they in fact describe the success of the grid of PCs connected to the Internet and the level of innovation associated with it?

With that said, I suggest that generativity as a conceptual framework lends itself well to application in a critical social approach to research, as it opens up for the investigation of a given technology while adhering to 'the big picture', not excluding either technological, social, cultural, institutional, economical or political sources of domination. The application of Zittrain's conceptual framework, to the critical investigation of a given technology, is rooted in the assumption that the Internet-PC grid does in fact possess a unique emancipatory potential, as have been argued for in this thesis.

In my work I have also demonstrated how the application of Zittrain's framework may be complimented by Actor-Network Theory, for describing conflicts and negotiations among the actants how strongly influence the investigated technology.

5.3 Ethical considerations

I have formally, by email, asked anyone who is referred to by name, in my work, for their consent to do so. I have also asked for the consent to publish the two interview transcripts.

6 CONCLUDING REMARKS

Initially I presented my problem formulation as such:

In this critical inquiry I seek to shed light on what factors might be hampering the NMI's overall capacity to spur the (peer) production and disclosure of information and points of view, which can be built upon, filtered and synthesized by a large, varied and uncoordinated audience, as well as lend itself to internalization and application by the individual in her local context.

In my analysis I emphasized the influence of three such tangible factors:

- 1) The lack of a strong de facto standard for publishing and retrieving mobile web content
- 2) The obscure and unpredictable prices on mobile data traffic consumption
- 3) The side-effects of a dominant and revenue making CPA-infrastructure; in particular the telecom operators strengthened incentives to control content providers and end users interests towards the NMI

The lack of a strong de facto standard for the mobile web is simply caused by the speed of innovation in handheld device design, caused by the huge amount of competitors involved in developing and manufacturing devices. The early days of the PC and the first Internet browsers were characterized by the very same issues (e.g. Netscape and Internet Explorer). The major difference between the early days of web standards for PCs and the present issues with the mobile web is in the sheer number of different browsers following a variety of standards on all kinds of screen sizes and resolutions all over the world. Over time, these issues are going to diminish, but at present I suggest that we need to develop robust technologies and tools that let the individual address these issues according to her needs in her local context (e.g. search engine).

In Norway, the obscure pricing schemes on data traffic have contributed to enhance the negative effects of a lacking de facto standard, as Mobile Internet exploration has been made particularly unattractive. The cultivation of the NMI may be supported by addressing the unpredictability of the prices, or

simply lowering the prices to such an extent that the current 'gambling' approach is transformed into willful exploration.

The last of the three factors I have emphasized, concerns the mobile telecom operators and the strong incentives for them to control change in the case of the NMI. We have seen that technologies of control may be placed into both handheld devices and the network they are connected to (e.g. preprogrammed start pages and billing systems). We have also seen how these technologies have assisted the telecom operators in effectively controlling and dictating the interests of both content providers and users of the NMI.

In order for the NMI to fully realize its emancipatory potential and also reach a higher level of generativity; information, content and services needs to be presented in the same format as it is on the traditional Internet. The (Norwegian) Mobile Internet needs to tap into all the resources currently available on the traditional Internet, as opposed to the handheld devices functioning as appliances dedicated to receiving bits and pieces of highly adapted information and content through controlled information channels. Only by tapping into all the information that is currently available on the Internet, may we begin to further true innovation and develop new high level services that may address the needs and desires of Mobile Internet users.

It is easily imagined that changes introduced by the dominant device manufacturers and the large international Internet companies will have global impact and determine the course of development for the (Norwegian) Mobile Internet, but as we have seen the Mobile Internet does have national borders. Control mechanisms and 'technologies of power' may readily be introduced at a national level, also in Norway.

It should be noted that the development and introduction of the CPA-platform was actually initiated against the mobile telecom operators' (i.e. Telenor) managerial interests, as pointed out by Hanseth and Nielsen (2007). Only when the business model appeared to have a widespread success and large revenue making potential, did it start to give telecom operators the incentives to resist change. This is why I will argue for a more deliberate cultivation of the NMI to take place; more actors and interests need to be represented in

dialogue and negotiation. We have seen a prelude to such negotiations with the media industry joining forces to produce change through the FNMC.

6.1 Implications for further research

The Mobile Internet is in a time of transition. Unfortunately, this has already been pointed out for nearly a decade, and I am currently joining the ranks of optimistic prophets expecting the NMI to reach new heights within a short time frame. First and foremost my optimism is grounded in the device design revolution. A revolution, in the sense that the standards developed for the regular Internet, are becoming directly applicable to the Mobile Internet.

Still, there are many ways to implement 'technologies of power' rather than 'technologies of the self', or to develop strategies and mechanisms to control change and indirectly hamper innovation. What are the incentives behind the current implementation of the Sesam search engine available at the telecom operators' portals? What does the alternative and self proclaimed more open mobile portals look like in practice and what will be the motivation behind their designs? The Internet media industry joined forces to produce change, but what are their motives and actual change strategies beyond weakening the strong role of the telecom operators' portals? I suggest that the emerging alternatives to a NMI dominated by mobile telecom operators needs to be investigated from a critical social perspective.

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Appendix 1: Vocabulary

These are clarifications of concepts and abbreviations used throughout the thesis, which are marked with an asterisk (*).

3G

3G is the third generation of standards and technology for mobile networking, superseding 2.5G. It is based on the International Telecommunication Union (ITU) family of standards under the IMT-2000.

3GP

3GP is a multimedia container format defined by the Third Generation Partnership Project (3GPP) for use on 3G mobile phones.

Common Carrier(s)

A common carrier is a business that transports people, goods, or services and offers its services to the general public under license or authority provided by a regulatory body.

De facto

De facto; is a Latin expression that means "concerning the fact" or in practice but not ordained by law.

GSM

Global System for Mobile Communications; is a digital cellular phone technology based on a specified standard for how data is sent over a wireless network. It is the predominant network system used in Europe and Asia.

ICT / ICTs

Information and Communication Technology; is an umbrella terms that includes any communication technology, device or application.

Information System(s)

See *IS*.

Information and Communication Technology / - Technologies

See *ICT/ICTs*.

IS

Information Systems; is a sub-discipline of computer science. Defined by Roger Clarke (1995) as such: "[T]he multidisciplinary study of the collection, processing and storage of data; of the use of information by individuals and groups, especially within an organisational context; and of the impact, implications and management of artefacts and technologies applied to those activities."

Network Neutrality

See *NN*.

NIX

Norwegian Internet eXchange; is a junction for IP based traffic in Norway.

NN

Network Neutrality; is a principle that is applied to residential broadband networks, and potentially to all networks. A neutral broadband network is one that is free of restrictions on the kinds of equipment that may be attached, on the modes of communication allowed, which does not restrict content, sites or platforms, and where communication is not unreasonably degraded by other communication streams.

Norwegian Internet eXchange

See *NIX*.

Networked Public Sphere, the

See section 2.3 of this thesis.

Public Sphere, the (Habermas)

See section 2.2 of this thesis.

SS-7

Signaling System #7; is a set of telephone signaling protocols.

VoIP

Voice over Internet Protocol; is a general term for a family of transmission technologies for delivery of voice communications over the Internet or other packet-switched networks.

WAP

WAP is an open international standard for application layer network communications in a wireless communication environment. Its main use is to enable access to the Internet (HTTP) from a mobile phone or PDA.

WLAN

A wireless LAN or WLAN or wireless local area network is the linking of two or more computers or devices using spread-spectrum or OFDM modulation technology based to enable communication between devices in a limited area.

STPA

QOS

See Quality of Service.

Quality of Service

Quality of Service refers to the capability of a network to provide better service to selected network traffic over various technologies, including Frame Relay, Asynchronous Transfer Mode (ATM), Ethernet and 802.1 networks, SONET, and IP-routed networks that may use any or all of these underlying technologies.

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Appendix 2: Interview Transcripts

The transcribed interviews are presented here for purpose of completeness and are only made available in Norwegian.

Transcribed Interview: Telenor Nordic

Interviewer: Terje A. Sanner (TAS)

Interviewee: Jan Øyvind Agedal (JØA), Enterprise Architect

Date/Time: 30.09.2008 / 12:00

- TAS** Hva er egentlig stillingstittelen din her hos Telenor?
- JØA** Stillingstittelen er løsningsarkitekt og løsningsarkitekter blir allokert på prosjekter. nå er jeg ansvarlig arkitekt på et prosjekt som heter IP-TV.
- TAS** Under en tidligere presentasjon ved instituttet for informatikk snakker du litt om Telenor og jobben din som løsningsarkitekt. I presentasjonen la du spesielt stor vekt på evnen til fornyelse og å tilpasse seg forandring. Kan du si litt mer om hvorfor du ser på disse aspektene som spesielt viktige for akkurat Telenor?
- JØA** Telenor er en gammel POTS(*)-bedrift. Men det har jo blitt bredbånd, IP, IP-telefoni, TV over IP osv. som har kommet nå i det siste, og da krever det en del av både nettverket og oppsettet av nettverket og hvordan det skal være. Fra *linjeswitch* til *pakkeswitch*, holdt jeg på å si. En ny måte å tenke på, men også for en del kundesystemer. Så det er noe vi må tenke på hele tiden.
- TAS** Jeg ser for meg at Telenor er preget av en form for divisjonalisert struktur med en del ulike interessefelt og satsningsområder.
- JØA** Ja, men du, vi hadde en plan, eller vi vurderte hvor vidt vi skulle bare sette en strek og si at alt det som var før et gitt tidspunkt det er 'gammel moro' - og så har du IP-verden, som er 'ny moro', så lager vi nye støttesystemer, nye *network management* systemer, nye kundefrontsystemer og nytt alt. Det høres jo ut som en besnærende tanke, men hvis du går inn og ser det litt mer i detalj, så ser du at en person, når han har en vanlig analog telefon og så har han bredbånd fra Telenor så ønsker jo han at det skal se ut som om det er integrert, vertfall at kundefronten skal være integrert. Du får kun en regning og du blir bare registrert en gang, sånn at viss du ringer inn om en feil så skal vi vite at ja du har telefoni og så har du bredbånd, så ting henger litt mer sammen enn det. Du kan ikke bare ta en *clear cut*, og si at alt det gamle er bare det gamle - og så bare sett opp en helt ny *stack* ved siden av - for at der er relasjoner. Du må leve i en verden med begge. for når vi så på det mer og mer, så fikk vi se

flere og flere slike steder hvor du måtte ha relasjoner, så på slike ting så vi at det ble for dyrt å gjøre sånn *giant step* for å kople seg tilbake til *legacy systems* på et utall steder, da blir det spagetti uansett. så da var det bedre å modellere det gamle til å inkorporere også nye aspekter fra IP basert telefoni.

TAS <<Viser til artikkel på digit.no med uttalelser fra informasjonsansvarlig i NetCom, og påstanden om at mobilt Internett står stille.>>

JØA Ja, det er jo helt feil. Eller, det kommer an på hva du legger i begrepet Mobilt Internett forresten. Når jeg hører begrepet Mobilt Internett, så er det at slike PCer som det (han peker på en bærbar pc på bordet) kan være på Internett, selv om ikke de er *connected*. Sånn at det er 'Mobilt Internett' i Telenor, mens 'Internett på Mobile Enheter', det er Internett på sånne dingser som dette (holder frem en mobiltelefon). Det er noe helt annet. Men Mobilt Internett er i en voldsom vekst og det er, ja, det er i en grassat vekst.

TAS Det er et veldig viktig poeng som kommer frem her nå. Slik jeg ser det er det flere forskjellige betydninger av nettopp dette begrepet basert på forskjellige kontekster. Slik jeg oppfatter bruken av Mobilt Internett som begrep fra blant annet min veileder, Ole Hanseth sin side så dreier Mobilt Internett seg ikke om å knytte en tradisjonell pc eller en bærbar pc til Internett ved hjelp av mobiltelefoner som modem.

JØA Men da er det *Internett på Mobile devicer* du snakker om. eller på små håndholdte, *small*, *smallscreen* er egentlig. *smallscreen* er nøkkelordet her; '*Internett på smallscreen*'.

TAS Jeg er nok enig med deg, ja, i at avgrensninger her går på *smallscreen*. For det er akkurat det som er noe av den interessante greia her; hvor begrensende er egentlig den skjermen? I hvor stor grad kan egentlig disse tjenestene som vi har blitt vant til og forbinder med internett brukes på små håndholdte enheter? For dette henger jo da veldig sammen med generativitetskonseptet - hvor det ideelle scenario er at alt er veldig åpent og veldig fritt - altså å se på i hvor stor grad mulighetene ligger til rette - hvor åpent systemet er og tilrettelagt for forandring.

JØA Ja, igjen så, da kan jeg nok være enig med Øivind Vederhus fra NetCom om at det ikke har vært så voldsom vekst, og det kan godt være at det kommer til å forbli slik. Det man har sett er at vi kan jo ikke måle helt nøyaktig hvor mye vekst det er på Internett gjennom slike *devicer*, altså sånne små håndholdte fordi at ofte blir disse brukt som modem til en stor, og da er det jo trafikk som går igjennom denne telefonen likevel og da kan ikke vi

vite hvorvidt den trafikken er noe som blir vist på en større skjerm. For oss er det mobilt bredbånd uansett - for det er bredbånd som går over HSDPA eller et annet Turbo 3G nett UMTS eller EDGE eller noe sånt.

TAS Ja, akkurat, det er også interessant, for i den artikkelen så virket det jo da som om NetCom hadde en måte å ha kontroll over denne trafikken på, fordi der blir det hevdet at bruken av mobil som modem har blitt tredoblet over det siste året, mens det blir hevdet at trafikken til mobilskjermen står stille. Samtidig poengterer Erik Saastad i dagbladet at begrensninger i muligheter for å holde øye med trafikken på håndholdte mobile enheter kan være en hemske for utviklingen. Han snakket om at det går an å måle WAP, men ikke noe annet.

JØA Ja, for du har jo tjenester som *wap.aftenposten.no*, for eksempel. Det er jo en helt egen tjeneste som du kun bruker på mobil, men så er det jo mange som laster ned *www.vg.no* som jo er den samme versjonen som du får på PC-en. Å vise den på en liten skjerm, som du kan gjøre - er ikke helt optimalt om du spør meg da, og så tar det litt lang tid. Man ser jo at forsiden på *vg.no* har økt, nå var den vel oppe i 2 megabyte, tror jeg, før var den 1 megabyte, så størrelsen dobles hver 18 måned, eller noe sånt. Det er en markant økning i forsiden for folk. Det tenker jo ikke folk over. Når du sitter på en *fixed*, et bredbånd som er med kabel da eventuelt med WLAN så merker du ikke det i noen særlig grad - når du går over HSDPA og et mobilt bredbånd, så merker du det - der er det kapasitetsproblemer, men du merker det kanskje ikke så mye viss du skal på *smallscreen*, for da skrur du ned hele siden, da er du ofte på en eller annen WAP-side som er begrenset, må tilpasse enormt til skjermen. Det har jeg også sett på tv da, som jeg jobber mest med. der er det jo; vi behandler PC og flatskjermer som TV-er da - på samme måte, mens mobil er noe annet. Der må du ha et annet innhold. Du må ha mye mindre oppløsning og mye mindre båndbreddekrevene innhold.

TAS Når det gjelder prismodeller så har NetCom har et 20 kroners tak på prisen for en dags datatrafikk, og Telenor har da 15 kroner for en megabyte men et tak på 75 kroner for en dags trafikk.

JØA Vi har forskjellige. Vi har en som heter *lite bruk* og en som heter *fri bruk* og så er det en som heter *middels bruk* eller noe sånt tror jeg. Og på *lite bruk*, da er det sikkert sånn som du sier. For fribrukt betaler du 399 kroner i måneden, tror jeg. Da kan du bare bruke så mye du vil. Og så er det *middels bruk*, eller er det kanskje *proff* det? Da har du gratis fra kl 07:00 til 17:00 på dagen, og så betaler du for ettermiddagen og helgen. Det er sånn for businessfolk da. Det er en tre-fire sånne, jeg husker ikke alt. Og så er det en begrensning på fem gigabyte i måneden.

TAS

Den er på alle dem?

JØA

Spesielt på *fri bruk*, så kunne man jo tenke seg at, men det skal jo noe til å sitte og, for båndbredden varierer jo veldig. (pause). Men igjen, det er jo all trafikk over HSDPA, eller på ett turbo 3G-nett. Hvorvidt trafikken da vises på skjermen eller om det lagres på en PC eller lagres på minnekort eller noe sånt, for at du senere skal vise det på en TV - det vet vi jo ikke. Det er jo noen som laster ned film, eller bilder eller noe sånt da og som de da har på mobilen sin, eller musikk som de skal spille på et stereoanlegg eller vise på en TV - da er det jo ikke for å vise det på en *smallscreen*. Men det han *dagbladetfyren* sikter til er jo dagbladet sin portal, som du viser på den lille skjermen mens du sitter på bussen. Min hypotese er at det er et begrenset marked fordi folk har større skjermer der de kommer fra og der de drar til - det er akkurat mens de drar, mens de reiser, mens de er på flyttefot, så kan det være aktuelt. Når man sitter på kollektivtrafikk da spesielt.

Ja, hvor var vi? Vi var på dagbladet og deres portal, husker jeg i alle fall. De har en portal. Jeg var på et seminar hvor den ble omtalt. Krigen går på en måte om at innholdsleverandøren skal ha hele portalen eller om distributøren skal ha et felt oppe og nede hvor de kan legge sine egne banners, og der er det en - der er det en krig. For da vil jo distributørene få inntekter, mens de viser innholdsleverandørenes innhold. Krigen dreier seg vel egentlig om hvem som skal få betalt for hva. Det er opplagt at det koster å bygge nett. Telenor må få betalt for det. Det er ikke gratis. Kan ikke ha gratis bredbånd rundt omkring. Vi legger jo flere milliarder i året i å bygge ut *core network* og vi oppgraderer jo basestasjoner til Turbo 3G og sånt. Så det sier seg jo selv at det gidder vi ikke å gjøre viss vi ikke får penger for det. Det er jo ingen som gjør det. Før var jo Telenor, Televerket og da ble vi jo pålagt å gjøre ting. Da kunne jo like godt NetCom bygge det ut, så kan vi bare legge tjenester på toppen, viss vi må gjøre det gratis. Med disse volumøkningene som kommer med og med multimedia osv så kreves det ganske mye oppgraderinger. Det er dyrt. Det er kostbart; veldig kostbart.

TAS

En opplagt ting fra et brukerperspektiv, dersom man har et relativt lite budsjett til surfing på nettet via mobil eller *smallscreen* så er det jo klart at mangelen på en standard i forhold til hvordan den mobile enheten skal få mobilt innhold. Dersom man skriver *www.vg.no* så havner man på standardversjonen og dersom man skriver *www.dagbladet.no*, så blir du videresendt til en 100kb versjon.

- JØA** Ja, det er klart det. Så er det jo også prising. Det har jo mye å si da. Det at det ikke er forutsigbar prising. Viss det hadde vært sånn fri bruk type, for 399 i måneden og så kan du bruke det så mye du vil, så hadde det vært fint, men det gjelder jo bare i Norge, og det er jo helt grassat, og Telenor advarer jo folk på det sterkeste mot å bruke mobilt bredbånd i utlandet, for det er jo sånne avsindige avgifter på det i enkelte land. Det er jo disse andre selskapene rundt om kring som setter sine priser og Telenor må jo bare betale det til dem, og da kan ikke vi sponse, så det er jo fordi det ikke finnes noen *roaming* avtaler på akkurat det her da. Så Telenor, på ett eller annet tidspunkt så tror jeg at man sperret faktisk, for bruk av mobilt bredbånd i utlandet, for man mente at ingen ville kunne forsvare en sånn pris. Du fikk jo teleregninger på tusenvis av kroner. Man kunne komme hjem med 10-15-20 tusen i mobilregninger bare fordi de hadde vært i utlandet og vært uforsiktige med å laste ned. Forsiden på VG kan fra utlandet koste 200 kroner, ikke sant. Det er jo helt latterlig.
- TAS** Nå er Mobilt Internett et så komplekst tema at jeg har i alle fall ikke forstått alle faktorene som spiller inn, men man har jo altså da primærtjenesten når det gjelder stemme, at du da altså faktisk ringer da, og så har du alternativet at du kan overføre stemme i form av datapakker som Skype gjør over fastnettet, med nye kommende muligheter for *Skype-mobil*. Samtidig som vi nå har fått Apple sin Iphone den har vel en slik mekanisme at den *switcher* til trådløse WI-FI soner når den er i dem - når den er i dekningsområdet.
- JØA** Mobilt bredbånd fra Telenor og også det fra NetCom er jo et produkt der som du kopler inn i PC-en din, og så er du på nett. Det er slik at du tar alltid det billigste nettet, så du tar, viss du er i dekning av en WLAN sone, som du har tilgang til så velger han den, viss ikke så velger han HSDPA viss du har dekning for det, eller så velger han EDGE eller så velger en UMTS, så sånn er det der også, men det er jo på dataoverføringer, vi har jo ikke Mobile VoIP ennå.
- TAS** Ja, men hva er det som hindrer det da?
- JØA** Det er jo ikke noe annet enn at man implementerer det. Det krever jo litt teknisk. Håndsettene må jo for eksempel takle det.
- TAS** Er VoIP en reel trussel for telekommunikasjonsoperatørene?

- JØA** Jeg vet ikke om det er en trussel, men det er en, altså, du må jo ha bredbåndet ditt fra et sted, og da er jo et turbo 3G-nett, som er da fra din teleoperatør, og, ja, man får jo inntekter av det også. Jeg kjenner ikke inntektsmodellen for GSM versus Turbo 3G eller om Mobile VoIP når det en gang kommer i fremtiden om det vil være billigere enn taletrafikk over GSM, for den taletrafikken over GSM er jo relativt lavt priset i dag. Så jeg vet ikke om det er så mye å hente på det.
- TAS** Nei det måtte jo være dersom du brukte så mye trådløse data
- JØA** Ja, WLAN-soner? At du ikke brukte turbo 3G, men brukte WLAN?
- TAS** Ja, det måtte jo være det da.
- JØA** Åpne WLAN-soner? Men det er jo greit for sluttbrukerne hvis, men de som tilbyr disse åpne WLAN sonene må jo ha en eller annen bredbåndstilbyder. Om det da er, ja, om det er Telenor eller noen andre NextGenTel eller noe sånt og så setter opp en bredbåndsruter der, men da må jo den bredbåndstilbyderen passe på at det er kapasitet til det i nettet og de må jo ta seg betalt slik at de kan bygge ut sitt nett. Så det er jo - pengene må komme. Selv om det da, hvis det er noen som er barmhjertige samaritaner og legger ut masse gratis WLAN tilgjengelig rundt omkring, så vil allikevel de som er barmhjertige, de må snu seg rundt til sin bredbåndsløseleverandør og betale. Så på en eller annen måte må inntektene dekke utgiftene. Men da vil jo kanskje inntektene gå over ifra mobilt til fastnett. Så for operatørene som har både mobilt og fastnett så er det kanskje lettere enn for NetCom, ja, nå er jo de i Telia da, og så har de nettet der. Det koster jo penger det også.
- TAS** På et mer generelt plan, hvilke faktorer mener du er utslagsgivende i forhold til at Mobilt Internett som fenomen ikke har tatt av. Hva mener du skal til for at det skal ta av eller bli større som fenomen?
- JØA** Det er klart at dersom det hadde vært enklere å bruke, slik at hvis du hadde hatt, når du skrur den på, at hvis du hadde hatt en Internettknapp på en måte. Når du trykker på den så kommer du til en velkjent portal som er godt designet og du har linker til de vanligste ting. Som du eventuelt kan konfigurere selv da. Og som da, hvor du holder deg innenfor WAP eller mobilt innhold designet for mobil eller *smallscreen*. Men du måtte jo hatt anledning til å bruke det, og det er det jo ikke så ofte at du har. Den mobiltjenesten som jeg selv bruker mest er NRK tekst-tv. Som jeg har installert på mobiltelefonen. Viss jeg har ett minutt til rådighet hvor jeg bare står og venter på noen eller gjør ett eller annet så slår jeg bare fort opp tekst-tv og det er bare en knapp og så kommer jeg til

tekst-tv, som jo er designet med lav oppløsning sant, sånn som du har hjemme på TV-en. Du har bare *headline news* tekst informasjon om dem i et velkjent format osv. Helt ypperlig for en *smallscreen* om du spør meg.

TAS Jeg har tenkt på en del bruksområder for mobile enheter. I og med at svært mange mobile enheter kommer med medfølgende og innebygd kamera og muligheter for opptak av lyd osv, så kan man på ta for seg og rekonfigurere konsepter som *microblogging**, hvor man kan ta denne trenden ett steg videre og berike opplevelsene med ulike former for media. Man kan dele bilder, filmsnutter og lyder fra sin hverdag med venner og familie.

JØA Ja, det er interessant. For eksempel har veldig mange telefoner GPS i seg og så har de veldig bra kamera. Eventuelt kan man ha kamera som har en GPS i seg også, som du eventuelt kan sette et SIM-kort i, sånn at du får mobilt bredbånd til dem også. Da kan du tenke deg at du tar bilder og så bare automatisk laster opp til et sikkert lagringssted, som er da en sånn nettdisk egentlig. Så kan du sende linker til det eventuelt til venner og bekjente. 'Se her er de siste dagens bilder'. Eller hvis du er ute på ferie så kan du bare linke til det stedet hvor alle bildene dine havner fortløpende, som andre kan se på eller som du selv kan se på. Da vil det jo være automatikk i at du bare tar et bilde og så bare *swop* så er det lastet opp, når det er ledig kapasitet, ikke sant. Slik at det er en synkronisering mellom mobiltelefonen og lagringstjenesten. Det ville ha vært interessant. Og da kunne man relatere det til blogger også, med *geo-positioning* osv.

TAS En spennende mulighet med GPS er jo at du kan forbinde forskjellige mediastrømmer opp imot en bestemt lokasjon som *Google-maps* for eksempel, som støtter en overgang mellom GPS og *Google-maps*. En tjeneste som jeg personlig har savnet er en slags, i forhold til posisjonering, en tjeneste lignende *gulesider.no*, men med brukergenerert innhold hvor du kan legge inn informasjon om bedrifter, severdigheter osv, slik at når noen befinner seg på et sted hvor de ikke er helt lommekjent så kan de ut ifra sin posisjon spørre systemet etter nærmeste enhet av en gitt type f.eks. nærmeste treningsstudio, solarium eller nærmeste kiwi butikk. Man kunne her se for seg et system med likhetstrekk med *wikipedia* hvor informasjon ble knyttet opp mot ulike adresser og oppdatert fortløpende av systemets brukere. På denne måten ville informasjonen til en hver tid kunne oppdateres og holdes relevant, i motsetning til et tradisjonelt system som *gulesider* hvor det vil forekomme svært mange "døde" enheter i systemet som ingen har interesse av eller mulighet til å fjerne/oppdatere. Videre ville brukere kunne gi anmeldelser av hverandres anmeldelser og bygge opp et rankingsystem innad blant brukere med administratorer.

- JØA** Ja, men den er ikke ideell å drive input på, en sånn liten *device* som dette.
- TAS** Nei, du har selvsagt brukergrensesnittbegrensningene. Man måtte da se for seg at *input* mot et slikt system foregikk på vanlig PC mens informasjonshentingen/konsumeringen foregikk på mobile enheter.
- JØA** Du vil alltid gå til en *big screen* hvis du har muligheten til det og det har du nesten over alt hvor du er. Når du er hjemme, når du er på jobb, når du er på hytta og der du ellers måtte være, så har du en *big screen* normalt sett. En eller annen, en TV eller en PC eller noe slag. Og hvis de da kommer seg på nett alle sammen, og de kan de jo da med mobilt bredbånd, altså ikke i form av bredbånd på små *devicer*, men ved hjelp av mobiler eller lignende som modem. Så da er det jo bare når du er på farten, når du faktisk transporterer deg fra ett sted til et annet og ikke har anledning til å ha en *laptop* på fanget, eller et ønske om det. Så er det jo muligheter. Men eller når du er ute på byen på puben eller et eller annet sånt ikke sant, men det er jo klart at du har et begrenset informasjonsbehov, i hvert fall etter mine begreper, i sånne settinger. Når du er på ferietur og sånn, eller på sightseeing eller sånn da er det jo klart at da laster du jo ikke med deg en PC; da har du en mobiltelefon, med kamera og sånt. Men ellers så går man jo til den store skjermen. Når det gjelder for eksempel Mobilt TV så har jeg for eksempel forsøkt å se på noen Start kamper, på Mobil TV bare for å teste det ut da. Man kan jo ane hvor ballen er, du ser jo litt mer i forhold til å bare få oppdateringer på scoringer på SMS, så ser du i alle fall når scoringer er og du hører jo kommentarer. Det er jo noe bedre da, men man er jo nøden. Det er jo ikke noe sånt som du gjør dersom du ikke er ekstremt interessert og ikke har noen andre muligheter.

Transcribed Interview: Rubberduck Media Lab

Interviewer: Terje A. Sanner (TAS)
Interviewee: Espen Erikstad (EE), CTO
Date/Time: 30.10.2008 / 10:00

Espen Erikstad is part of the trio who founded Rubberduck Media Lab in 2004. Today he is the CTO of the company that has a total of 21 employees.

TAS Til nå har jeg snakket med representanter for Telenor Nordic og Dagbladet. Rubberduck har jeg dessverre svært lite kunnskap om på forhånd, så du kan kanskje starte med en kort introduksjon til selve foretaket.

EE Vi startet i 2004. Det vi gjør er egentlig *streaming* til mobiltelefoner, eller multimedia til mobiltelefoner. Vi har utviklet og satt opp en plattform her i Norge som gjør at innholdsleverandører eller mobiloperatører som vil tilby multimediatjenester til kundene sine kan bruke vår plattform. De kommer med innholdet og så setter vi opp disse tjenestene. Vi kan ta dagbladet som et eksempel. På vanlig web så har jo de; dagbladet-TV - hvor de produserer en del videoinnhold - som de enten kjøper fra andre eller som de produserer selv. Vi tar det innholdet der og så lager vi en mobilversjon av det. I utgangspunktet så blir dette et tilbud til alle brukere av det du kaller Mobilt Internett. Når vi går gjennom en mobiloperatør som Telenor eller NetCom, så legger vi på en liten *billing* på det - altså en betaling på det, for at sånn som modellen er nå med Telenor og NetCom det er at vi.. det å kjøre *streaming*-tjenester eller multimediatjenester er veldig båndbreddekrevende tjenester for sluttbrukeren og det blir derfor utrolig dyrt. Man betaler typisk for hver megabyte man laster ned. Det vi har gjort er at vi har på en måte en slags avtale med Telenor og NetCom, at de tar seg ikke betalt for trafikken fra våre servere, for det blir alt for høyt. I stedet har vi lagt på et billingsystem, slik at sluttbruker betaler en pris som er mye lavere enn selve trafikken. Slik at det blir spiselig både for Telenor som skal dekke sine nettverksutgifter og sluttbrukeren. Men i tillegg så har jo vi innholdsleverandører som dagbladet som kunder, og de er jo egentlig ikke så interessert i å ta betaling fra sluttbrukeren på denne typen tjenester, så vi tilbyr også dette til de som kommer inn på telefonen med trådløs tilkøpling på telefonen - som iPhone og den typen, da er det jo veldig mange som bruker telefonen, men er koplet på et trådløst nettverk og får tilgang til Internett på en annen måte da og de får jo også tilgang da til dette innholdet.

Når det gjelder mobiloperatører så går vi gjerne inn og setter opp en tjeneste for dem, etterpå så går vi og gjør avtaler med innholdsleverandører så legger mobiloperatørene som Telenor avtaler til rette med innholdsleverandører så aggregerer vi liksom en pakke med innhold, med TV kanaler og med videoklipp osv. Så selger vi det som en pakke og da kan vi gjerne lage en abonnementsmodell slik at man kan abonnere på dette for 50 NOK i måneden, så kan du se så mye du vil. Det er da typisk vanlige tv-kanaler i MobilTV-utgaver. Det er på en måte veldig kort fortalt hva vi gjør. Det er jo veldig nisje da. MobilTV og mobilvideo har jo et begrenset marked, men så er det til gjengjeld ikke så mange som leverer slike tjenester. Vi er ganske internasjonale og har ganske mange internasjonale kunder. Samtidig er det en nisje som er i veldig vekst nå. Det som du sier om at internett på mobil står stille, det kan være, men vi ser i hvert fall en veldig stor økning i de tjenestene som vi leverer. Samtidig ser vi en økende interesse fra mediebransjen og mobiloperatørsiden om å få på plass denne typen tjenester, og dette er jo Internett-tjenester, som krever at du har minimum en 3G tilkobling for at det skal kunne være noen kvalitet å snakke om.

I utgangspunktet er vi altså ikke en tjenestetilbyder. Vi eier ikke disse tjenestene. Vi tilrettelegger dem for dagbladet, NRK, Telenor osv. Vi har en teknisk løsning som vi bygger og så er det de som eier disse tjenestene. Det står jo dagbladet på dagbladet sine tjenester og Telenor på Telenor sine tjenester - det står liksom ikke Rubberduck noe sted.

TAS Siden dere er en internasjonal aktør er det interessant å fokusere litt på prisingen av tjenestene dere er involvert i å tilby. Prisingen av tjenestene blir helt opp til innholdsleverandørene som knytter seg opp mot deres plattform?

EE Vår tjenesteplattform er jo - vi setter jo opp tjenester og du kan si at det er jo tjenester som i utgangspunktet er tilgjengelig over det åpne Internett. Men så er det slik at de tilpassningene man må gjøre i en mobil setting. Det er jo slik som jeg sier, at viss man går inn på en tjeneste som vi har på en hvilken som helst mobiloperatør i utlandet eller hvor det nå måtte være så er det som regel slik at du får tilgang til det og du kan bruke tjenestene, men dersom man på forhånd ikke har gjort en *'white listing'* av trafikken fra våre servere så blir det veldig kostbart og det blir helt uspiselig. Du kan jo ta youtube som et eksempel, som har en tjeneste, en mobiltjeneste, som er tilgjengelig over hele verden. Alle kan gå inn på den på mobiltelefonen og se på den. Men der har du den problemstillingen at dersom du ikke har en dataplan, slik at du betaler for hver megabyte, så blir det voldsomt dyrt å se et eneste klipp. Det kan fort koste deg 200 kroner.

Bransjen går bare og venter på at mobiloperatørene skal gå over til en prismodell med en fast pris på data, altså slik som når du har bredbånd hjemme, så betaler du jo ikke per megabyte. Vi gjorde jo det når man begynte å introdusere ADSL på 90-tallet en gang. Da startet man faktisk med det, at man hadde bare så og så mange megabyte. 100 megabyte og over det så måtte man betale mer. Det er litt der vi er nå også, på mobil. Teleoperatørene tviholder på den gamle tellerskritt-tankegangen. Men vi ser jo at det går imot fastpris, og man har jo begynt med fastpris abonnement allerede. Det går jo an å få tak i det, og det vil gå mer og mer over til det. Men det vil jo si at, da vil jo mobiloperatørene måtte gi slipp på den inntektstrømmen som er ganske stor. Så det er jo derfor, slik som man ser det nå, at man tviholder på dette.

Ja, vi snakket om åpent Internett, trafikk, kostnader og operatører. Bransjen venter på at det åpne Internett og Mobilt Internett skal bli helt.. bli det samme. Samtidig er det et lite paradoks for innholdsbransjen, man vet jo at på mobiltelefonen så koster alt. Alt koster penger. Alle tjenester har en pris og det er liksom ganske innarbeidet hos brukerne. Det koster å sende SMS og alt sånt. Samtidig er det en stor betalingsvilje. Når man lager mobile Internett-tjenester, som nettleserbaserte tjenester så har man gode muligheter til å ta betalt direkte fra trafikkbruken. Du kan kjøpe innhold gjennom en nettside og du kan ta betalt bare på liksom å motta gratis oppdateringer eller noe sånt, og dette er typisk gjennom integrasjon med mobiloperatøren. Dersom man går over til at det blir helt sammensmeltet; Mobilt Internett og vanlig Internett, så vil jo etter hvert folk også forvente at alt er gratis, slik som det er på det åpne Internett. Så det er et lite paradoks der også fra innholdsbransjen. Samtidig er det noen tradisjonelle internettaktører som Google, Yahoo og Dagbladet som ønsker at alt skal bli helt åpent, slik at de kan kjøre den samme forretningsmodellen på Mobilt Internett som de nå gjør på det vanlige åpne Internett. Og så er det jo en del aktører som driver med mobile tjenester, som er deres hovedfokus og som er spesialtilpassede tjenester for mobil, og de har jo en annen forretningsmodell. De lever jo faktisk av at brukeren betaler for disse tjenestene. Så der er det jo en del forskjellige typer krefter.

TAS

Ja, for eksempel er jo hele CPA-plattformen basert på at innholdsleverandører tar informasjon som man tradisjonelt kan finne gratis på Internett og tilby det på mobilen.

- EE** Det er jo ikke noen tvil om at en åpen Internett-løsning på det Mobile Internett vil være til fordel både for sluttbruker og for tjenestetilbudet. Det ville ha vært mange flere aktører som utviklet tjenester for mobiltelefoner og gjerne da også bedre tjenester. Så det er jo på en måte at operatørene og også delvis den mobile innholdsbransjen som holder litt igjen. Det er jo ikke optimalt for tjenestetilbudet.
- TAS** Man kan tenke seg et Mobilt Internett på linje med tradisjonelt Internett, like åpent og like fritt. Samtidig kan man tenke seg at det tradisjonelle Internett beveger seg i retning av fragmentering og regulering på lik linje med telekommunikasjonen i dag. Hvor på skalaen den endelige balansen inntreffer blir ingen tilfeldighet. De valgene som blir tatt i nærmeste fremtid vil nok være med på å legge rammene for vår digitale hverdag i lang tid fremover. Den største trusselen for et åpent *ende-til-ende* nettverk er nok at mange sluttbrukere vil velge trygghet og sikkerhet fremfor total åpenhet.
- EE** Det er vel kanskje litt sånn en del mobiloperatører opererer i, det er jo mange som - de har jo et ansvar ovenfor sluttbrukeren, for hvordan type innhold som er tilgjengelig. De kan jo bli holdt ansvarlige for hva slags innhold som er tilgjengelig for deres brukere. Med de portalstrategiene som vi har nå, så er det ofte slik at de forsøker å tilby brukeren et utvalg med innhold som er kontrollert av operatøren. Men om det er noe sluttbrukeren faktisk er interessert i.. jeg vil jo tro at de fleste faktisk er interessert i å få tilgang til mest mulig informasjon.
- TAS** Det interessante er egentlig å se de forskjellige aktørene og hvem som kommer til å få sine metaforer inn i de teknologiene vi bruker i fremtiden. Hvilke standarder fra tradisjonelt Internett og tradisjonell telekommunikasjon kommer til å leve videre i det nye integrerte nettverket.
- EE** Da er det jo interessant å se på Nokia og den strategien de har. Nokia prøver jo å ta en posisjon som et Internettselskap. Akkurat det er veldig interessant i og med at de er en svært sterk aktør. Nå prøver de jo å bevege seg inn på innhold og bli en seriøs Internettaktør. De har jo en tankegang som ikke inkluderer mobiloperatørenes interesser. Nokia tenker bare på at mobiloperatører tilbyr Internett-tilkopling som hvem som helst annen, om det er en tilbyder av trådløst nettverk, eller en ADSL, så spiller det ingen rolle for Nokia - de vil bare ha brukerne på Internett. Samtidig er det de andre aktørene som Google, Yahoo og Microsoft - de store internettaktørene, som også har en ganske bevisst og aggressiv Mobilstrategi nå. Yahoo har kommet med en egen applikasjon for svært mange telefoner, som samler liksom alle deres tjenester i en applikasjon.

Google har mange tjenester for mobiltelefoner og spesiallagde tjenester. Så det er interessant å se på. Vi dere er det nok interessant å vurdere håndsettprodusentenes interesser opp imot de store internasjonale internettaktørene, mobiloperatørene og den mer lokale innholdsbransjen. Det er interessant å se på hvem som vinner frem. Google har kommet med et eget operativsystem for mobiltelefoner. Det er veldig mye som skjer, og det er veldig mange store aktører som har forskjellige strategier for å kapre kundene som tradisjonelt tilhører mobiloperatørene. Slik som det er i dag, så er det jo mobiloperatørene som eier disse kundene, og de har jo en stor inntektstrøm fra de kundene. Men nå ser vi i større og større grad at de andre store aktørene forsøker å kapre de kundene fra mobiloperatørene. Mobiloperatørene blir presset til å åpne opp, og dermed står de i fare for å miste den inntektsstrømmen, samtidig som de andre store aktørene har en mulighet for å sikre seg en ny inntektsstrøm og de kan enkelt gjenskape tjenester som de tradisjonelt tilbyr på Internett til det Mobile Internett.

For oss er det ganske interessant det som skjer nå, og det skjer ganske fort. Det gjelder å prøve å posisjonere seg i forhold til det som skjer. Det som er helt klart er at mobiloperatørene må gi mer slipp på en del av sine.. de kan ikke fortsette å være privilegerte innholdsleverandører. I dag så er det mange teleoperatører som også er innholdsleverandører. De lager sine egne tjenester og prøver å tilfredsstille det behovet markedet har for tjenester. Men det fører jo bare til at tjenestetilbudet blir begrenset, når de ikke vil slippe til andre. Dersom det blir helt åpent så er jo Google og Yahoo der med en gang, med de beste tjenestene, fordi de er så store og har så mange folk som kan gjøre jobben. Så det går jo liksom i den retningen. Mobiloperatører må gi slipp på det markedet og vil til slutt bare bli en tilbyder av båndbredde.

TAS Hvilke følger har denne trenden for den fremtidige forretningsmodellen til Rubberduck Media Lab?

EE Egentlig så vil det jo være.. sånn sett så er jo mobiloperatørene i dag en stor del av våre kunder, så den delen står jo for så vidt i fare dersom mobiloperatørene slutter å ta eierskap til den typen tjenester, innholdsleverandører og sånn. Men samtidig så lager vi jo tjenester for mobil som er spesialtilpasset til alle dagens håndholdte, og det, dersom vi liksom gjør det lettere for andre aktører å tilby disse tjenestene til sluttbrukere så er det bare utelukkende positivt for oss. Vi vil likevel være den tekniske leverandøren av den typen tjenester. Slik er det jo allerede i dag. Vi har jo snakket om Dagbladet og VG og sånn som bruker våre tjenester, i dag er det jo en integrasjon med operatøren, men vi tilbyr også til åpent Internett; til iPhone og til telefoner som har trådløs Internett-tilgang. Det er klart

at det er litt skummelt at vi kan miste den inntektsstrømmen som mobiloperatørene gir oss, men i utgangspunktet er vår forretningsmodell basert på at vi skal tjene penger på at sluttbrukeren bruker denne typen tjenester. Dersom nettverket blir mer åpent så vil flere sluttbrukere bli eksponert for flere typer tjenester og flere innholdsleverandører vil komme til oss for å få hjelp til å sette opp slike tjenester. Det er likevel klart at det er stor forskjell mellom å kunne ta 10 NOK for at noen ser et klipp til at det blir gratis og reklamefinansiert. Det er et stort gap der. Det er jo uansett litt kunstig mange av disse mobiltjenestene. Folk betaler 30 kroner for en ringetone. Slik har det vært lenge, men det vil jo ikke vare. I dag er det slik at dersom du er litt teknisk anlagt så kan du bare laste inn ringetoner gratis via PC-en, og så har du ringetonen.

TAS Ja, det er ganske rart at sånne tjenester klarer å holde seg i live så lenge etter at det egentlig burde være et dødt marked.

EE Ja, det er markedsføring. Det er kun det som holder liv i en rekke av mobiltjenestene. Men de tallene der går likevel fort nedover nå samtidig som de store marginene er i ferd med å forsvinne i den bransjen. Du har jo hatt syke marginer i den bransjen, hvor utgiftene har vært minimale. Du har noen som bare sitter og trykker noen tangenter på et *keyboard* og så kan du etterpå selge varen for 30 NOK til en rekke sluttbrukere. Slike marginer vil helt klart forsvinne. Det vil komme en ny generasjon med tjenester, men de marginene vi har sett til nå vil vi nok neppe se igjen på mobile tjenester. Folk blir nok mer bevisste. Frem til nå har folk vært vant til at det som er på mobil, det koster penger, og betalingsviljen har vært der. Det blir nok mer spesielt nå som folk ser at det ligner mer og mer på Internett og at de da også forventer at prisene blir som ved vanlig Internettbruk. Betalingsviljen til folk varierer ganske kraftig fra marked til marked.

TAS Når det gjelder bruker an de tjenestene dere leverer. Hvordan måler dere egentlig bruken av tjenestene?

EE Vi ser jo ganske konkret hvor mange som går inn og ser på innhold fra våre servere. Vi *hoster* og konfigurerer alle tjenestene våre selv, så vi ser jo ganske klart fra dag til dag hvor mange som har vært inne og sett på innhold og sånt. Det er en ting at det er en vekst fra tjeneste til tjeneste, men det henger jo veldig sammen med hvordan det hele blir markedsført. Du kan jo si at viss det ikke er noen markedsføring så vil det jo ikke vokse av seg selv. Folk må eksponeres for tjenestene for å bruke dem. Det er ikke slik som på Internett at du kan sette opp en tjeneste og kun markedsføre den på Internett nesten uten å bruke en krone egentlig, altså med *Goodle-adds* og lignende så kan du nå et ganske stort publikum uten egentlig noen aggressiv markedsføring. Slik er det jo ikke på Mobilt

Internett - vi har ikke en sånn markedskanal. Man er jo avhengig av at mobiloperatørene setter tjenesten opp på sine portaler eller at man kjører kampanjer på det.

TAS Hva tenker du om fremveksten av standarder for Mobilt Internett? Vi ser jo nå at innholdsleverandører går sammen for å få mer slagkraft; et eksempel er MobilForum.

EE Når det gjelder teknologi så er jo det standardiseringsløpet ganske fastsatt. Når man snakker om Internett og nettleserbaserte tjenester så er det jo veldig likt som på web. Man har HTML, XHTML og disse standardene som har utviklet seg og blir implementert på mobiltelefoner. I Norden har vi Nokia og Sony Ericsson som står for omtrent 95 % av markedet, så de står jo for etableringen av standarder når det gjelder de håndholdte enhetene. Det samme gjelder videodistribusjon som vi driver med også, der er det jo internasjonale standarder, som tilsier at den delen er ganske fastsatt. Så det går vel mer på å se på å samle.. for det å navigere på en mobiltelefon er vel ikke sånn.. jeg er jo en ganske avansert bruker, jeg taster jo inn webadresser og alt sånt, mens for andre er det ikke sånn bruk egentlig - man går inn på en portal og så klikker man på de linkene som er der, og det er jo gjerne portalen til en mobiloperatør. Da er det jo egentlig mobiloperatøren som bestemmer alt sammen. Så det går mer på det å gå sammen og lage et tilbud eller en mer åpen løsning som ikke er så styrt av mobiloperatøren.

TAS Den krigen der har jo i senere tid dreid som om startsidene på de mobile enhetene og hvorvidt mobiloperatører som Telenor skal ha muligheten til å låse det til sin egen portal eller ikke.

EE I dag er det veldig kontrollert fra mobiloperatøren sin side. Jeg vil tro at bruken av Mobil Internett slik som du definerer det her stort sett går via mobiloperatørens portaler.

TAS I dag så har man også svært mange eiere av mobiltelefoner som faktisk ikke vet om mobiltelefonen har internettmuligheter eller ikke. Man mangler vel kanskje den helt enkle og intuitive Internett-knappen.

EE Du har vel egentlig Internett-knappen i dag, men da går du jo til portalen til din mobiloperatør, og så ser du på det innholdet der uten egentlig å få inntrykk av at det er det som er Internett. Det er jo begrenset hva som ligger tilgjengelig på den portalen. Så det handler vel om å komme over den terskelen der da. Men det finnes jo flere initiativ til å lage flere typer portaler; uavhengige portaler, som linker opp til aktører som har mobiltilpasset innhold. De aller fleste innholdsleverandørene i Norge i dag har mobiltilpassede sider.

Appendix 3: Imaginary Mobile Internet use case scenarios

Narrative I: Mobile Media Weblog

You have decided to embark on an outdoor holiday trip in the western highland of Norway; Sunnmørsalpane - only bringing with you the most essential equipment for survival and comfort. Nonetheless, you have decided to bring with you two high-tech devices, your mobile phone and your DSLR camera. Your motivation for bringing the mobile phone was twofold. Most importantly you decided to bring it for safety in case of emergency but you also wished to bring it along as a means of communication with your friends and family. Your intention is not to call them, but to keep them up to date on your adventures via your *Mobile Weblog*. Your mobile phone is equipped with technology for capturing high quality sound, images and video. You notice the sound of a bird that you have never heard before, and you eagerly try to capture its singing into the microphone of the mobile phone. As soon as the sound has been recorded you try to take a picture of the bird, with the maximum digital zoom of the mobile phone camera. Unfortunately, the digital zoom doesn't do the bird justice so you grab your DSLR camera - the result is an excellent picture. Finally, you are just lucky enough to capture its flying technique on video as it disappears into the forest. You write a brief note, on your phone, about your encounter with the bird and save it together with the sound clip and the video in a folder and press the synchronize button. When you push the button the data in the folder is synchronized with an online data storage service. The service is designed so that all the material you upload is added and further synchronized with your Mobile Weblog and your micro-blog. Now, your friends and family members can be notified immediately about your blog updates as they all are eager subscribers of a service that lets them follow your media enriched 'broadcasts' of your everyday life, on their own handheld devices. Finally, you remove the SIM-card from your mobile phone and insert it into the SIM-slot of the DSLR camera. The camera, which also supports mobile broadband, lets you synchronize the high quality picture with the same Mobile Weblog entry.

Narrative II: Mobile Shopping

You are riding by train on your way to work and suddenly remember that last night you promised to replace your friend's Spanish grammar book, as you were the one to spill coffee all over it. You bring out your new and flashy mobile phone and the stylus that came with it and hit the Internet button. In a less than a minute you have found the book you are searching for in a Norwegian online bookstore. You add it to the shopping cart and request a checkout. You look over the order details and accept them. You choose the payment option that say SIM BankID* and enter your four digit personal code. Once more you are asked to confirm the transaction and you accept. Your order has been placed.

Narrative III: Mobile Navigation

You are visiting a friend in Trondheim, this is not the first time you spend time in this Norwegian city, however you are far from familiar with all the available services. Your friend is in a business meeting and you are supposed to meet up in town. Not knowing the city too well you decide to seek out the location agreed upon a bit early and just 'hang out' in the area until your friend arrives. The public transport service is able to bring you to the desired location a lot sooner than you were expecting and you wish for something useful to do whilst waiting for your friend. Being a frequent consumer of tanning services the idea of taking a 20 minutes tan immediately pops into your mind. You wonder if the branch you normally seek out in your home town has a filial in Trondheim and whether it is nearby your location. You immediately get your mobile phone out of the pocket and push the Internet button. The device is connected to the Internet in the blink of an eye and you feel safe that the cheapest possible solution has been chosen for you. You enter an online peer production based community whose purpose is to keep updated information on all franchises in Norway, along with consumer reviews. You enter the name of the franchise you are seeking and submit the query. You are in luck; a map is loaded onto your screen showing you where you are in relation to it. They have a tanning studio only 1200 meters away from you. Off you go.