The commodification of internet data transfer and its impact on public-sector AV online services. Network neutrality and broadband content: the example of the EU member state Germany.

Jan Krone

Tassilo Pellegrini

Fachhochschule St. Pölten

Department Wirtschaft & Medien

Institut für Medienwirtschaft

Matthias-Corvinus-Str. 15

A-3100 St. Pölten

[jan.krone;tassilo.pellegrini]@fhstp.ac.at

Tel: 0043 2742 313228 [-416/-417]

Version_091207

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Abstract:

The paradigm of network neutrality accelerated the mass diffusion and adaptation of the internet as a mass medium, giving rise to the diversity characterizing the internet today. The expansion of existing networks in the course of the next generation of broadband technologies has initiated a discussion, beginning in 2005 and originating in the U.S., which challenges network neutrality as a universal interconnectivity paradigm for IP-based networks. This challenges existing provision strategies of data-intensive multimedia content raising specific interrelated and pertinent regulatory questions. This article focusses on four areas of interest: the interplay of telecommunication and media regulation, commodification and public value orientation, freedom of access and power of disposal over proprietary services and network neutrality and potential for diversification in the telecommunication sector. It provides a media economic analyses of the changing paradigms in network neutrality and illustrates how these developemnts might affect the provision strategies in the public broadcasting sector with a special focus on the German market.

1. Introduction

1.1. The Context

The technologically induced transformation of media on the basis of IP-based telecommunication services has raised a large number of questions in need of solving, regarding the diversification of business models and media structures on the one hand and the

challenges for corresponding media and telecommunication regulation policies on the other. According to Yochai Benkler (2006, p. 383ff), the associated discourse takes place between the opposing poles of controlling access to the technological infrastructure and protecting immaterial goods, and it culminates in the assumption that

> [...] the shift to broadband internet has been accompanied by less competitive pressure and greater legal freedom for [network] providers to exclude competitors from, and shape the use of their networks, [while] that freedom from both legal and market constraints on exercising control has been complemented by increasing pressures from copyright industries to require that [network] providers exercise greater control over the information flows in their networks in order to enforce copyright. (Benkler, 2006, p. 384)

The discourse thus levels out the field of conflict over public interests in the sense of public values.

To summarize: at this point in the development of the market,[i] network providers are considering to charge the service of data transport to those parties which input content from outside the own network according to volume and quality in the broadest sense, rather than only to the user as recipient of the data or to the providers as such via price models. Therefore it is to be expected that distribution as a cost factor for broadband internet content will have to be reconsidered.

This paper focuses on the pertinent debate about the functions and effects of network neutrality, thus highlighting a central aspect in the contemporary transformation of the media, which will be analyzed in the following chapters with regard to its effects on the media market in general, and on public-sector broadcasting in particular. Although this field has been under scientific consideration for some time in specialist literature and market

information services (cf. for example Becker, 2008), the connection between public-sector broadcasting as part of a dual broadcasting system and the organisation of technological communication systems like the internet remains opaque. While the necessity of further developing must-carry regulations for mass media (cf. Iris Spezial 2005) in the context of network providers' diversified proceeds models has been mentioned, a precise classification of the possible consequences for public-sector broadcasting within the EU against the background of mass internet access and the second EU telecommunication bill is still wanting. As an example of this, consider a recent publication (Dörr & Wiesner, 2009)[ii] focusing on walled-garden services with journalistic content, like VoD platforms and IPTV packages, which are successively becoming more established as data retrieval utilities in households, thus encroaching on the field of activity of public-sector services with obligatory input. The authors further affirm that in a study by the European Council [...]" it is pointed out that "in 'open' networks principles of 'network neutrality' play an important role in ensuring public access to linear and non-linear services" (Dörr & Wiesner, 2009, p. 551). On the following page, the term network neutrality is used without inverted commas and is posited as a demand by public-sector broadcasting services on network providers. This parallel article will now consider in which context non-discrimination, carriage delay and service equality have to be understood and which sets of problems can be derived from this.

The term network neutrality basically means that a network provider (backbone) is not allowed to discriminate data packets within its network according to their nature, ownership, service, terminal, volume, place of origin and target location, but that the backbone is required to provide a consistent 'quality of service' (cf. Marcus & Elixmann 2008). This demand implies a drastic limitation of possible business models using variable pricing models, gradations of technological quality and prioritization of data packets.

Obligatory network neutrality, as a matter of telecommunication law, served as a necessary measure in the previous phase of development of the internet, in order to operationalize complex tariffing interdependencies among network providers. Contrary to conventional interconnectivity regulations within the classical field of fixed and mobile telephony networks, the paradigm of network neutrality accelerated the mass diffusion and adaptation of the internet and gave rise to the diversity characterizing the internet today.

The expansion of existing networks in the course of the next generation of broadband technologies has initiated a discussion, beginning in 2005 and originating in the U.S., which challenges network neutrality as a universal interconnectivity paradigm for IP-based networks. Network providers argue that the excessive amount of data resulting from the increasing intermedialization of the internet through video and music downloads, streaming services and rich content applications makes it necessary to upgrade the existing infrastructure, leading to a demand for evolutionary accounting models. To date, examples of services which profited by free carriage include (as an unsystematic list) YouTube,[iii] Flickr, VoiP, Zattoo, online games, universities and peer-to-peer networks like Skype or PirateBay; but finally also the multimedia services (media libraries) of public-sector TV providers. Table 1 provides an exemplary overview of the positions in the conflict over network neutrality.

Table 1: Positions in the Conflict over Network Neutrality

For network neutrality	Against network neutrality
- innovation friendly (public value) - quicker diffusion of new services over the internet - open access - user sovereignty - benefactors: # VoD platforms # P2P applications # media libraries # content providers without proprietary infrastructure	- innovation friendly (economy) - excessive amounts of data through multimedialization of the internet # downloads # streaming # rich content applications - diversification of pricing models # Quality of Service # IPTV (HD) # Re-Bundling

As a solution, network providers have proposed a versioning model for 'Quality of Service' (QoS) that enables different service qualities and (as a consequence) data services according to tariff classification. While classical economic theory holds that market-propelled diversification of service products furthers prosperity as a rule, the special case of network neutrality begs the question in how far a disavowal of the principle of network neutrality in the context of an already highly concentrated market structure (regional monopolies) among network providers benefits discriminatory practices and serves to change the situation of the consumers for the worse. The peculiar field of activity that is the internet could be at least partly closed to the public, at the same time depriving service providers of their economic base, which relies on the principle of network neutrality. Therefore there is a valid public interest, also from an economic point of view, in upholding the right to network neutrality. The latest development in the debate about network neutrality, induced by a 2009 paradigm shift in the U.S. (Obama) administration, exhibits a focus on the innovative power of an 'open internet', in favor of securing open data traffic. The notion of an apparently 'historically' acquired right of way for individual users as well as network-based service providers is increasingly finding political support, also in the European Union, as an application of the basic right to freedom of information and with regard to aspects of diversity. The proponents and opponents of network neutrality thus confront each other with identical terminologies in their support: both the 'benefactors' listed above and the network providers equally claim the innovative power of their positions for themselves.

1.2 Problem Statement

This article deals specifically with four interrelated and pertinent fields of conflict:

1. Telecommunication and media regulation
2. Commodification and public value orientation

3. Freedom of access and power of disposal over proprietary services

4. Network neutrality and potential for diversification in the telecommunication sector

The impact of these conflicts on public-sector broadcasting between existing network neutrality for data transfer via the internet and the consequences of its restriction or abolition can be seen in the intersection between the distribution channels of IP-TV, Web TV and media libraries (VoD services). The success of these services on the market (and the fulfilment of the public-sector objectives) appear to be predicated on the upholding of network neutrality for financial reasons. In cost accounting data disclosed in the context of three-stage tests, information about the cost of distribution has been insufficient to date (cf. Rott/Grannemann, 2010). Besides a rise in semi variable costs due to higher demand, additional variable costs for network transmission and specific routing would come into play.[iv] On the other hand a limitation or abolition of network neutrality presents network providers with the option of implementing tariff versioning for Quality of Service, which to date has been an optional expansion of the proceeds spectrum regulated only through unsanctionable Terms of Trade agreements. Similarly to cable TV network providers, it is possible to charge content providers (to date only at the point of input), other providers transmitting data through a proprietary network ("free riders", to date not in contact with the providers through whose networks their data is transmitted due to network neutrality), as well as users (data recipients; to date mostly flat rate models as far as fixed connections are concerned) for the data volume which they generate. This can generate proceeds to be used for further expansion of the infrastructure, or, to put it simply, the pertinent field of business can be reshaped conforming to the rules of the market.

We will address the topic on the basis of a secondary analytical approach comparing market and regulation structures in the U.S. to those in the European Union, and specify the results using the example of public-sector broadcasting in Germany with its public value mandate.

The basic assumption is a valid programming mandate for public-sector broadcasting in its entire breadth. As our hypothesis and sub-hypothesis we define:

The departure from the principle of network neutrality on the internet has a disruptive and reactive effect on the general public on the one hand and on competition on the media market on the other hand, due to its privileging of market concentration, especially for public-sector broadcasting with a public value mandate on the internet.

Actors on the market are accustomed to a new product by network providers until a structural dependency is established, so that after reaching a critical mass the business or regulation model can be adapted to the providers' own interests or to modified public welfare interests.

Our focus at this point is on a European solution to the problem of network neurality for the field of mega and meso media (cf. Zerdick et al., 1999) in the context of public-sector broadcasting, supplemented by open channels. This solution includes Must-Carry regulations as an integral part of universal service regulations; the compulsory, non-discriminatory transmission of broadcasting programmes with a special mandate for free public and political opinion making through foreign networks, for a fee, as an adequate approach. The 1997 Amsterdam treaty and the consequent changes to the EU television directive and telecommunication directives as well as their implementation in national regulations, for this analysis mainly exemplified by German regulations, provide the background for this. The attempts by network providers to limit or abolish network neutrality can be viewed as an exemplary case of regulation in emergent markets. As this article's focus is on institutions with a public value mandate, neither individual end users nor the private-commercial broadcasting and multimedia sector are central to this analysis, but they remain within our extended focus.

2. Definitions

2.1 Network Neutrality

Network neutrality is both a regulative fact and a convention to enable market-driven innovation in dynamic markets, where the fact that not everything can be regulated has become a basic constant for economic competition. Network neutrality is defined as the equality of physical units (bits) in data transfer through IP-based networks. Network neutrality thus defines one of the main features of the World Wide Web in its contemporary form. Network neutrality per se is nothing new; it can be understood as a specific variant of interconnectivity regulations within the telecommunication sector. It differs from regulated network neutrality for fixed and mobile telephony networks in that network providers' pricing options are limited due to the lacking potential for diversification.

2.2 Data Transfer and Quality of Service

The infrastructure on which data transfer is based can be described as a layer model (cf. Fransmann, 2003) containing five successive layers representing areas of activity: 1) equipment and software layer, 2) network layer (backbone provider), 3) end-to-end connectivity layer, 4) navigation and middleware layer, and 5) application layer. IP protocol is employed as a technological interconnectivity standard at the interfaces between network layers (2) and end-to-end connectivity layers (3). At these intersections there is an exchange of data traffic between internet service providers (e.g. internet access and web hosts) and the so-called backbone providers (e.g. AT&T, NTT, Qwest, COLT, Deutsche Telekom AG etc.),

thus defining the borderline between wholesale and retail level for the telecommunication market. Table 2 visualizes the layer model according to Fransmann, 2003.

Table 2: The Layer Model

Layer	Acivity	Example Companies
VI	Customers/Consuming	
V	Applications Layer, including contents packaging *(e.g. Web design, on-line information services, broadcasting services, e-commerce etc)*	Reuters, AOLTime Warner, MSN, Newscorp, ZDF, ORF, etc
IV	Navigation & Middleware Layer *(e.g. browsers, portals, search engines, directory assistance, security, electronic payment, etc)*	Google, Yahoo, Mozilla, Internet Explorer, Paypal,Genie, etc
III	Connectivity Layer *(e.g. Internet access, Web hosting)*	IAPs and ISPs
TCP/IP INTERFACE		
II	Network Layer *(e.g. optical fiber network, mobile network, DSL local network, radio access network, Ethernet, frame relay, ISDN, ATM, etc)*	AT&T, BT, NTT, WorldCom, Qwest, Colt, Deutsche Telekom, Vodafone, NTT DoCoMo etc
I	Equipment & Software Layer *(e.g. switches, transmission equipment, base stations, routers, servers, CPE, billing software etc)*	Nortel, Lucent, Cisco, Ericsson, Nokia, etc

Source: Fransmann, 2003

It is at this intersection that the debate about Quality of Service unfolds. Trick & Weber, 2007, identify the following technological aspects of quality:

1) Time and speed of data transfer,

2) Variance and delay of data transmission,

3) Bandwith flexibility, and

4) Consequent services such as garanties against data loss and protection from cyber-crime.

With the last aspect the debate about Quality of Service has reached the equipment and software layer (1) of the telecommunication market, represented e.g. by companies such as Alcatel-Lucent and Cisco. These are already positing a new generation of hardware on the market, in order to utilize the potential for diverisication in the area of security and specific traffic management.

Quality of Service is thus being debated not from a perspective of format or quality of content, but from the perspective of data volume. The question of the infrastructure needed to guarantee data transfer in pre-defined quality is also being debated, as the properties of this infrastructure would then define key characteristics of goods in data traffic.

2.3 Public-Sector Broadcasting

In the member states of the EU, unlike in the US, public-sector broadcasting constitutes an active and institutionalized contribution to public opinion making (public-value mandate, public weal orientation) via national or regional programming mandates, financed at least partly through either license fees or state taxes. Licence fees are not considered to be remuneration for program reception. The funding of public-sector broadcasting on the one hand must not run contrary to the interests of a common EU market, while on the other hand it needs to fulfil the demands of its specific mandate.

Public-sector broadcasting within the European Union, with its cultural and democratic function, is protected by the immediate legal effect of European conventions as well as nationally through the protection of citizens' rights against the state (freedom of opinion, freedom of broadcasting, plural media systems within the EU). Besides this, public-sector broadcasting in Germany enjoys state guarantees of continuance and expansion, including the utilization of new technologies in order to fulfil their mandate, guaranteeing freedom of

access to information for those citizens who pay license fees, as well as developing the program in order to reach larger audiences. Public-sector broadcasting fulfils its mandate to generate public value also via the distribution channel of the internet.

3. Network Neutrality in the US

In order to make network neutrality as a regulatory principle more accessible, we will discuss the situation in the US before dealing with the opposing actors in our field proper. The tension between media service providers and telecommunication providers is characterized by entirely different conditions in the US than it is in Europe. As there is no comparable dual broadcasting system, the US debate about the topic is based on different premises. Because of these structural differences, aspects of regulation in the US cannot simply be transferred to the European situation, but they can function as an orientation. Up until 2008 (Bush administration), a market-oriented perspective was dominant in the debate, but it was widened to include social aspects by the relatively strong involvement of the civil rights movement.

The debate about a limitation or abolition of network neutrality was initiated mainly by US market actors. Network neutrality in the US is based on the Common Carrier principle, which differentiates between voice telephony and information services. While for the former (Voice-over IP) the Common Carrier principle defines the requirements for non-discriminatory market behavior, the latter are not regulated by this principle. Accordingly, cable TV providers enjoy greater economic freedom than conventional telecommunication providers, who however have been encroaching on the field of information services through DSL technology over time, and are now opting for an exemption from the Common Carrier principle for their internet services.

In 2005, the Federal Communications Commission FCC responded to public pressure by taking up the topic and submitting the *Telecommunications and Opportunities Reform Act* to congress in 2006. This bill was supposed to balance the divergent interests between telecommunication and cable TV providers and at the same time to strengthen consumers' rights in the field of information services. The draft, however, was rejected, leading to an intervention in 2007 by the Federal Trade Commission FTC, which made a stronger case for the telecommunication providers, arguing that the US broadband market was still young and should not be overly regulated, as would have been the case with the *Telecommunications and Opportunities Reform Act*. Since then, the policy of network neutrality was put forth in a number of different legislative drafts within various political fields. Parallel to this political process, some network providers have started acting against the doctrine of network neutrality by blocking or delaying data traffic from specific services, in spite of sanctions from the FCC. A renewed attempt by the US Democrats Markey und Eshoo, who drafted the *Internet Freedom Preservation Act 2009*, has succeeded in carrying the principle of network neutrality from the political agenda to the level of political formulation. The internet for them represents an "irreplacable platform" for communicative and economic innovation in the US. In the future, therefore, network providers should be prohibited from blocking or compromising access to legal content on the internet (through throttling bandwith or excluding licenced terminals). Beyond standard connection fees, no additional tariffs must be charged for the transmission of content, services or applications, nor may any applications be used that might hinder this regulation (Markey & Eshoo, 2009).

The FCC, which was proposed for supervision by Markey & Eshoo, has communicated its intentions to sustain network neutrality on Sept. 21st, 2009, in the face of criticism from network providers, thus establishing itself as a pioneer in the field. It held that the "key to the internet's success is its openness and not the discrimination of services". This, however,

should not exclude the option for network providers to allow for exceptions in the sense of premium data services (i.e. services requiring fixed bandwith to provide Quality of Service). The new regulations are scheduled for implementation during the first half of 2010.

4. Network Neutrality in the EU: The Telecommunication Bill

Compared to the US, the debate about network neutrality in Europe has had only very limited publicity to date. The discussion is enmeshed and juristically complex, and thus accessible only to specialised sectors. In Europe, the relevant sector is much more regulated than it is in the US, being encroached upon by state subsidiation of network providers with the goal of expanding broadband connections, and by the laws on telecommunication and broadcasting, which are clearly distinct from one another in structure and object. Because of the convergence and the development of strong interdependencies between the channels of distribution and their media content on the internet, the EU is aiming for a common regulatory frame for information networks on the long run.

Network neutrality as an object of regulation touches upon five existing directives which form the effective legal framework for electronic communication networks and services within the EU. These are the frame directive (2002(21/EG),[v] the access directive (2002/19/EG),[vi] the licencing directive (2002/20/EG),[vii] the universal service directive (2002/22/EG),[viii] and the data protection directive for electronic communication (2002/58/EG).[ix] The access directive (2002/19/EG) binds all telecommunication service providers (including cable TV providers) to technological and service neutrality, but no statement about tariffing is made.

In 2007, the EU Commission for Information Society and Media proposed the directive COM 2007/0247 as a reform motion, which will be examined during the second reading of the co-decision procedure in the EU parliament and is being debated controversially because of the

manifold dimensions of effect resulting from such a complex interdependent regulation between infrastructure regulation, broadcasting regulation and consumer protection. The establishment of convergent regulatory paradigms as supraregional regulations adapted to the supraregional distribution of digitized content demands an adaptive handling of technological standards (path, standard and technology of transmission, protection of immaterial goods) as well as consideration of the essential cultural sovereignty of the individual EU member states.

For this range of problems, the directive regulating access to electronic communication networks and services that was proposed in the first reading of the 2nd EU telecommunication bill plays a decisive role. It contains hedge clauses for broadcasting as well as a separation of network providers and content without intervention rights on the part of the European Commission. The tasks and the content of this directive were supplemented by the creation of a new board of national regulators (BEREC: Body of European Regulators for Electronic Communication) as a platform for communication.

The second reading deferred the proposal for the 2nd EU telecommunication bill to the conciliation proceedings which ended in November, 2009, because of dissension between the Commission and the Parliament. The new version of the regulation directive for the telecommunication market within the EU, which was accepted by the European Council, contains extended but _generally weak formulations promoting network neutrality_ (protection of the principle of open networks, minimum standards for service equality, transparency of traffic management procedures by network providers) within the European Union.

Direct references to the mandate of public-sector broadcasting are present in the allocation of decision-making authority on minimum standards to the member states' own regulation authorities for telecommunication.Traffic management is thus not left in the hands of network providers alone. The German Bundesnetzagentur (Federal Network Agency) invoked the new

FCC policy for sustaining network neutrality in data traffic already in September, 2009. The intention to guarantee network neutrality has also made it into the coalition agreement of the liberal-conservative government coalition: "neutral internet data transfer" is held to guarantee competition and reduce regulatory interventions into the data transfer market (cf. Meyer-Lucht, 2009).

5. Players in the Field - Competing Models for Regulation and Convergent Variations

In the course of the convergence of telecommunication and media, or information and communication, two models for regulation come to compete with each other. These differ with regard to their basic principles for the marketization of data traffic, and for the example of Germany also with regard to their different structures of authority (telecommunication laws at federal level, broadcasting laws at Land level).

The conflict over resources that is common to both areas manifests as a conflict of interest between content or service providers and infrastructure providers. While the former must attempt to reach as many customers as possible while keeping costs low and providing extensive services with a large data volume, the latter try to sell access to their infrastructure through offers with reduced data volume at the highest possible price. Strictly said, this conflict represents untackled market potential in the form of unrealized supply-and-demand relationships. This means that the broadening of the field of competition on the part of the telecommunication industry necessarily leads to a limitation on the side of public-sector broadcasting and of the multimedia industry in general, with the immediate consequence being that multimedia providers can only expect to stay in the market with the help of political interventions preventing a positive market failure.

In Europe, backbone providers have taken the initiative in demanding limitations to network neutrality. Because of the historical development of large-scale infrastructures, these command a greater amount of market power (former natural monopolists such as the Deutsche Telekom AG), therefore requiring less effort in order to efficiently coordinate their interests on a horizontal level.

The flat hierarchy of value generation in the multimedia sector endowes backbone providers with a social responsibility which they have hitherto fulfilled by enabling non-discriminatory data traffic on the internet. In terms of the distinction in competition law between content and infrastrucutre, backbone providers merely provide channels for information and communication. At the same time, an effect can be observed that has made itself felt as a change in framework conditions in terms of the follow-the-free model over a period of fifteen years.

Unlike in the Old Economy, in network economies a commodity gains value only through massive use, thus creating (for our purposes: communicative) relationships. It is not scarcity of goods that determines the value of a commodity, but abundance.

An example of nonobservance of this condition is the failure of the network service "Gopher" (cf. Netplanet 2009), in the early 1990s, as a service competing against the CERN's WWW, which was based on use of the public domain. From its launch in 1993, without the necessary amount of demand, Gopher followed the strategy of demanding fees for using its interconnectivity service. Despite meeting the second economic precondition for this technological interface, namely setting the benchmark for cooperative/collaborative standards on a technological level (e.g. TCP/IP or GSM for mobile telephony), Gopher could not compete with the Hypertext Transfer Protocol http (cf. Zerdick et al. 1999: 15-19). The strategic lowering of obstacles to market entry through open access to broader publics and new, larger market spectra, leading to disproportionately higher benefits for the users through

interoperability and compatibility, finally brought about the network effects utilized today by network providers, and to the rational or irrational dependencies connected with these, which can be compared to the relationship-based business of dependency management (i.e. drug trafficking), or understood as a socio-technological lock-in. The structural dependencies into which actors have entered, assuming the "internet" as a meritorious good, create a potential for pricing in the distribution market, not only because of the increased data load for network providers: the higher the amount of transmitted data, the higher the price on the one hand, and the higher the requirements for transmission quality (Quality of Service), the higher the price on the other hand.

This runs contrary to the interests of actors from the area of mega and meso media who fulfil their mandate (public-sector broadcasting) or market their private-commercial services assuming of an established right of way on the internet, in order to provide their content to users ubiquituously. Cost estimations in this still not fully developed distribution channel for multimedia information include uploading fees to individual access providers, but not transmission fees for the transmission of their content to users, to be paid to other network providers. A decisive characteristic of the internet as a medial technological interface, and a factor responsible for the tension between network providers and multimedia service providers, can be found in the unstable or deficient refinancing potential for multimedia services. The "for-free culture" as users' self-image on the one hand and weak basic prices for advertisement in the marketing of online advertising space ont he other hand leave little room for compensating a limitation of network neutrality. A massive decrease in provided content and a shifting of interconnectivity costs to end users (paid content) would have to be expected. This scenario describes a disruptive-reactive effect on society and its legally/contractually protected claim to information, as well as an impediment to innovation. The economical production of services would no longer be feasible in its current form for

public-sector broadcasting and its broadband online services. Beyond that, the intentional creation of scarcity by the network providers would have a lasting negative effect on the entire area of media competition, whether for dual broadcasting systems or other medial activity. On the other hand, the licence fees paid by users' households are not considered to be remuneration for program reception and would thus require a new adaptation for multimedia services.

For the entire public-sector multimedia economy, the field of conflict becomes visible as a consequence of the erroneous assumption of a freely operable good: the networks making up the internet have, for the greater part, always been private networks, within which the providers are now implementing additional business models. The spectrum of business model options has not been exploited before because backbone providers profited from network neutrality in the diffusion phase of the internet, and because in the EU most backbone providers are former state monopolists now attempting successively to utilize additional revenue potential in a liberalized and ever more competitive market controlled by national regulators.

Network neutrality, in this dialectic analysis between the areas of telecommunication and broadcasting, therefore cannot be interpreted as a natural basic condition. Within the debate, the strategic superiority of network providers becomes evident in the field of conflict between failure of the market and the state, where the regulation of emergent markets is concerned.

From the perspective of telecommunication regulators, the limitation of network neutrality has its causes in the increased data volume and the resulting cost burden for infrastructure providers, and it must be regarded with permanent consideration of both former state-funded networks and business companies' own upgrading efforts. In network industries, providing sustained multimedia services requires a high financial backing and thus implies a dominant market position, from which the necessity of ending network neutrality can be derived.[x]

On the side of telecommunication regulations, the premises touched upon in this context are grounded in the safeguarding of non-discriminatory access to content and its definition in a democratically relevant dual broadcasting system. These are cultural parameters, including the contribution to open opinion-making expected of mass media, which can only be subordinated to economical principles on a secondary level.

Another problem area is opened by the divergent constitutional allocation of rights and duties in relation to the European Commission for Information Society and Media. The directives for implementation in national legislation adopted in Brussels are equally relevant for two separate institutions of telecommunication regulation, thus carrying a certain risk of doubling or omission due to a lack of interfaces and different areas of application. While telecommunication legislation in Germany is a matter of federal law, broadcasting legislation is transferred to the Federal Lands: while the Federal Network Agency implements and supervises the liberalization of the telecommunication sector, the Lands pass Land broadcasting laws or interstate compacts for public-sector broadcasting in the dual broadcasting system. Private broadcasters are licenced and supervised by (joint) Land media institutes on the basis of Land media legislation/interstate compacts and enjoy comparable proprietary rights, derived from article 5 of the constitution, with reservations in the field of programming mandate and preservation of the status quo.

6. Public-sector broadcasting, open channels and network neutrality

Considering the aforesaid, the tension between public-sector broadcasting and network providers in Europe should be relieved through adapting the orientation of the existing regulation infrastructure on the convergent level of telecommunication and broadcasting (media) legislation. With reference to our central hypothesis presented in section 1.2, we can

deduce a number of derived scopes of protection for public-sector broadcasting, which need to be aligned both with the developments in the network provider sector and with state regulation:

1. Freedom of speech: As an elementary basic right of society and thus part of the general mandate of public-sector broadcasting, this notion would be threatened at least indirectly by a limitation/abolition of network neutrality. On the other hand, it is not possible to derive from this basic right alone the right to utilize others' network infrastructure free of charge as a matter of course.

2. Safeguarding of / contribution to diversity of opinion: Especially in the face of a limitation of access to electronic communication networks through backbone providers' pricing models, another basic right, namely that of freedom of information, becomes relevant to the regulation directive. As an adaptive transference from other structures for the dissemination of media content, such as the cable TV sector, a regulation like that for the dual broadcasting systems in Europe can be identified. Whereas the private sector is necessarily subordinate to exterior plural competition and thus finally to sufficient funds, public-sector interior plurality is in the service of the consumers and enables the implementation of the norms of broadcasting legislation on all levels of the determined channels of transmission (technological neutrality). In Europe, the defined public weal cannot, as it is in the US, be relegated exclusively to private contractors. Up to this date, this is not possible even if the field of competition on the internet is intermedial rather than intramedial.

3. Must-Carry regulations: The regulatory problem arising from network providers' intention to limit network neutrality in order to tackle latent business models within their own infrastructure, in opposition to the fulfilment of the public-sector mandate, can be solved by transferring te practice of Must-Carry regulations from broadcasting and/or

competition law (article 31 of the Universal Service Directive) to the internet. Must-Carry regulations do not imply an exemption from transfer costs in non-proprietary networks, but merely an obligation to transfer data, as it has been practised in a similar way in cable TV networks since the 1980s. These regulations stipulate that certain public-sector services must be made accessible to the public, not for free, but compulsorily. Such a regulation would therefore apply mainly to broadband services such as IP TV, streamed Web TV and media centers. In this way, the disruptive-reactive effects, both social-communicative and economic-innovative, can be avoided, and the content according to the public-sector mandate can be provided to the public, sustaining consent and interior plurality, similar to TV or radio broadcasting.

4. Citizen media: This "third pillar" of an informed society, as it has been called, raises another hitherto unsolved problem. While on the one hand there is a diversity of funding models within the EU (Germany: licence fees; Austria: mixed state and private funding), on the other hand no suggestions have been made for regulating citizen media ("open channels") on a European level. A limitation or abolition of network neutrality could affect this usage of new communication networks to a much greater extent than private-commercial services, consequently leading to a "capital-dependent ghettoization" of individual media genres in the basically intermedial medium of the internet. The exclusion of multimedia services through pricing models geared to data volume and Quality of Service criteria represents a new challenge for the EU directive for audiovisual media services against the background of the Maastricht and Amsterdam conventions (also, e.g. radio services have been neglected to date because of their manifest regionality). The widely different national regulatory paradigms also offer only limited prospects for transferring the necessity of harmonization in broadcasting (content) and telecommunication (amount and quality of data) to a common European standard.

7. Regulation of Network Neutrality in Germany

The technologically induced transformation of media towards IP-based communication networks as channels of distribution for broadband (media) content already necessitates the establishment of common coordinating institutions between Lands as regulatory partners for all parties in the field of media as defined by telecommunication law, as well as equivalent regulations for data transfer, such as Must-Carry regulations in TV distribution channels.

Existing legislation from the areas of television and radio implies a coordination of property ownership and the obligation to transfer broadband services, which has been implemented for the internet only in a very limited fashion. This regulatory practice can therefore be considered as a paradigm for implementing EU directives (2nd EU telecommunication bill) in order to moderate tensions between market interests and public weal orientation as well as federal and Land legislation.

The weak definition of network neutrality in the EU regulation directive for the telecommunication market (transparency of traffick management, observation of minimum standards and generally open access to communication networks) clarifies the requirements for the consequently responsible national regulatory boards to secure network neutrality for public-sector broadcasting in Germany.

The implementation requires new interfaces between the Federal Network Agency and the federally structured media system under Land legislation. A convergent and thus intersectoral regulation board like those established in the UK (OfCom) or Austria (RTR GmbH) facilitates the evaluation and clarification of the legal pretenses of public-sector broadcasting in the field of telecommunication law, thus loosening the fixation on genre-specific media analysis. The first implementations in Germany can be seen in the founding of common offices of the

Arbeitsgemeinschaft der Landesmedienanstalten (consortium of Land media institutions, ALM), e.g. for the allotment of DVB-H licences to mobile telephony providers.

Independently of the premises (access, variety, public-sector broadcasting) of European broadcasting policies, backbone providers, supported by telecommunication regulation, are taking a catalytic role in digital multimedia markets. This form of self-regulation (cf. Latzer et al., 2002) intends for a monitoring of the infrastructure created in part by former state monopolists through national agencies and a regulation of bit margins. The amount to which the self-concept and the constitutionally protected mandate of public-sector broadcasting can be integrated into the network market has been the focus of this analysis.

Basically, however, it needs to be said that a limitation or abolition of network neutrality constitutes a fundamentally natural business activity on the part of backbone providers. The standards of broadcasting legislation within the EU are based on the interpretation of freedom rights of a communicating society. If network neutrality is to be preserved under the premises of broadcasting legislation, it will be necessary to create areas which have to be made accessible according to the basic principles of public-sector broadcasting.

However, Must-Carry regulations do not include an exemption from transfer fees for the transmission of data through non-proprietary networks. This leads to the insight that tariffing for the transmission of broadband content might be unavoidable even if network neutrality were upheld. Public-sector broadcasting thus needs to work out new calculations for distribution in the course of reviewing new and existing broadband content. Additional licence fees charged to households would contradict the current practice of licencing, which holds that receiving or downloading public-sector content must not lead to additional costs in the households. Besides general access fees (cable, internet access) to network providers, licence fees consitute payment for providing the entirety of public-sector services to

households within a certain target area. The target area of the internet, in contrast to that of national broadcasting systems, is global.

Must-Carry regulations can be designed within the framework of a network neutrality in need of regulation, similar to regulations for mobile telephony networks, with statutory tariffing limits for the transmission of specific data streams in service of the public weal.

8. Summary and perspectives

A limitation or abolition of network neutrality has adverse effects that not necessarily go along with an increase in socio-economic benefits. On the winning side of this scenario are the telecommunication industry and those media service providers which command the necessary market power and capital resources to compensate for higher costs or relay them to other market actors (down to the end user). This scenario is attractive for media businesses inasmuch as a limitation or abolition of network neutrality would provide the economic framework for introducing paid-content models, which has been impossible in most cases up to now due to the structure of competition on the internet. From this perspective, the telecommunication industry's initiative is not necessarily in opposition to the interests of commercial media businesses, as long as these have the necessary prerequisites to compete on the new and corrected market. The corporate reform plans of the Deutsche Telekom AG as of November, 2009, as well as the continuing establishment of IPTV services by backbone providers as the 4th pillar of supplying a society with information (cf. Krone, 2009a), highlight the concentration on the perception of untackled market potential and the safeguarding of an exclusive Quality of Service. The unknown variable in this free-market perspective remains customers' willingness to pay.

On the losing side of this scenario, however, all those commercial and non-commercial media service providers must be considered who do not command the necessary resources or finances to compensate for or relay the increase in interconnectivity costs. Accordingly it needs to be determined whether Must-Carry regulations are adequate only for public-value services, or whether it might be necessary to create a framework for participation and "freedom of broadcasting" on the internet e.g. through public-value tests for private (non-)commercial multimedia serice providers, in order to secure freedom of communication in those areas inaccessible through only narrowband communication services.

The question whether a society's freedom of communication is depedent on broadband multimedia services, as long as narrowband communication services remain exempted from versioning by network providers (text-only communication via HTML and e-mail as well as telephony-derived services such as messaging or communication forums without Peer-2-Peer VoIP) is put to the test by the programming mandates of public-sector broadcasting institutions as adressees of this implementation. Especially since e.g. ARD and ZDF (the two main German public-sector television channels) are not permitted to publish "electronic press", i.e. narrowband text information, according to the 12th Broadcasting Reform Interstate Compact in effect since 2009.

What is still lacking are definitions of "broadband" and "narrowband" content appropriate to this context (bit margins, transmission delays) as well as their specific identification in all network services as special services in need of protection to further opinion-making and the forming of the political will in society. Whether a limitation of network neutrality would necessarily result in a failure of communication for broadband content cannot conclusively be determined at this point.

What is more predictable is the reaction of politics to the hypothesis considered at the outset of this paper: that the rights of users (i.e. the aspect of consumer protection) will be the main

focus of the political debate, with consideration given to the innovative power of the internet, non-discriminatory access to information, and the freedom to choose from services. In the wake of this argumentation, public-sector broadcasting and media content businesses emerge as the main beneficiaries of an expected political regulatory decision not to license the financial exploitation of network effects by network providers on a broader scale. To what extent partly state-subsidized cable networks require different regulations from mostly private mobile telephony networks has already been determined by the EU Commission for Information Society and Media through upper limits for roaming, data and telephony costs.

It is also possible to assess the need for media-economic research deriving from this spotlight analysis, regarding not only the coexistence of public-sector and private media services as a basic feature of dual broadcasting systems, but also the field of convergence research, which has been more or less weakly developed since the beginning of the transformation of media towards IP-based hybrid communication networks. Similar to the consolidation of press markets in Germany in the 1960s and 70s, a more or less self-regulatory process concerning data streams implies a return of traditional (media) maret structures. Adverse effects in self-regulatory market structures and models through limited network neutrality can be conceptualized using the methodical and theory repertoire of convergence research (cf. in detail Knoche & Zerdick, 1991-2; Knoche, 1999 & 2007; Lange, 2008).

Yielding to the demands of financially strong muldimedia conglomerates would also run contrary to considerations of diversity from the last century. A transition from low to higher barriers to market entry through dissemination structures has been countered in the past by regulating the media market in many diverse ways, and politics will conceivably attempt to prevent this development in the field of the internet. If control over the internet were left to network providers alone, the technological development would take a similar course to distribution control in classical media: going from users to network providers, who would

practically levy an "internet tax" for broadband content. The best regulatory approach would be the implementation of a consistent (world-wide) regulation for or against open access to a socio-technological system of communication, adapted to the specifity of the internet and its contents. The aforementioned innovative power is located in a field of conflict over freedom of communication and business activity, between network and content, that needs to be resolved politically, facing the challenge of a consensual distribution management.

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[i] "The telecommunication market declines by almost 4 percent. The decline in prices dampens turnover despite rising service use / No more than slight growth on the broadband market." *FAZ*, 10/11/2009, p. 19. [Our translation]

[ii] Dörr, R., & Wiesner, J. (2009). Zwischen Wirtschaft und Kultur: 20 Jahre EU-Fernsehrichtlinie. Grundlinien europäischer Medienpolitik. *Media Perspektiven 10*, 544-553.

[iii] Since November 2009, YouTube also supports full HD video (1920x1080 pixels), and is testing a 'light version' by the name of 'Feather' since December 2009, with reduced download time and fewer features for slower computers and mobile applications. Cf. *Heise Newsticker*, http://www.heise.de/newsticker/meldung/YouTube-unterstuetzt-kuenftig-Full-HD-Videos-859009.html, accessed 13/11/2009, and *ORF FUTUREZONE*, "YouTube testet Light-Version." Retrieved from http://futurezone.orf.at/stories/1633327/

[iv] Meanwhile groups of large service providers are discussing the implementation of certificate-based authentification of IP address blocks to ensure fixed routes of data packets through the internet, thereby essentially abolishing the open routing system. The intention is to make changing internet data routes more complicated, with proponents citing increased

security as a main benefit. Cf. *Heise Newsticker*, "Netzbetreiber wollen Routen sichern." Retrieved from http://www.heise.de/newsticker/meldung/Netzbetreiber-wollen-Routen-sichern-854376.html

[v] ABl. L 108 (24/4/2002), p. 33

[vi] ABl. L 108 (24/4/2002), p. 7

[vii] ABl. L 108 (24/4/2002), p. 21

[viii] ABl. L 108 (24/4/2002), p. 51

[ix] ABl. L 201 (31/7/2002), p. 37

[x] To mitigate this conflict between network providers and telecommunication regulations, the standardisation bord Internet Engineering Task Force IETF e.g. suggests concentrating on technological innovations in the area of transmission protocols. By identifying network bottlenecks and intelligent alternative routing of data packets it is said to be already possible to circumvent overstrained routes in individual sub-networks. Cf. *Heise Newsticker*, "IETF befasst sich mit Netzneutralität." Retrieved from http://www.heise.de/newsticker/meldung/142855