WWW.EFMN.EU The European Foresight Monitoring Network

Looking Forward in the ICT and Media Industry – Technological and Market Developments

Foresight Brief No. 154

Authors: Knud Böhle boehle@itas.fzk.de
Sponsors: The European Parliament's Panel for Scientific Technology Options Assessment (STOA)
Type: A European technology assessment/foresight project based on desk research and expert opinions
Organizer: Institut für Technikfolgenabschätzung und Systemanalyse (Institute for Technology Assessment and Systems Analysis) as member of ETAG, the European Technology Assessment Group (http://www.itas.fzk.de/etag/)
Contacts: Knud Böhle, ITAS, boehle@itas.fzk.de; Leo Hennen, ETAG, hennen@tab.fzk.de
Duration: Nov. 2007 – June 2008 **Budget:** 40.000 € **Time Horizon:** 2008ff **Date of Brief:** Nov. 2008

Purpose

The project was an activity within the framework contract between the European Parliament and ETAG, the European Technology Assessment Group, to carry out TA studies on behalf of the Parliament's STOA Panel in view of the growing importance of a European science and technology policy. The purpose of this particular project was to identify current and expected technological and market developments in the field of ICT with an impact on the media industry and to indicate regulatory challenges and requirements stemming from the anticipated changes. The main target group are the Members of the European Parliament; the wider addressee is the interested public.

Context and Objectives of the Study

STOA, ETAG and ITAS

Like many other parliaments in Europe, the European Parliament at the end of the 1980s set up an institution for scientific advice regarding complex social, ecological and economic implications of modern technology and scientific research. At the European Parliament, the process of consulting was and is organised by the so-called STOA Panel (Scientific Technological Options Assessment), a parliamentary body consisting of 15 Members of Parliament representing several parliamentary committees.

In 2005, the European Parliament decided to support STOA's activities by establishing permanent co-operation with a group of institutions with relevant expertise in the field of technology assessment. Since October 2005, this group, the European Technology Assessment Group (ETAG), has carried out studies on behalf of the STOA Panel.

The study presented here was carried out by the Institute for Technology Assessment and Systems Analysis (ITAS), the leading partner of ETAG.

Objectives and Focus of the Study

The aim of the study was to identify current and expected technological and market developments in the field of information and communication technology (ICT) with an impact on the media industry and to indicate regulatory challenges and requirements stemming from the anticipated changes. The thematic focus of the study was on computer based networked electronic media and particularly on Web 2.0 and user generated content (UGC) developments. Although the study is not targeted to support a specific policy action, it has to be seen in the context of activities of the European Commission related to 'creative content online' and 'user created content'.

Methodology and Approach

The study combines descriptive stock-taking efforts with more in depth analysis of selected policy relevant issues and an assessment of some future-oriented visions of ICT and media development. It combined (1) desk research, (2) expert enquiries and (3) a workshop with experts and Members of the European Parliament.

(1) The desk research could draw on many sources from scientific literature to online sources like blogs, newsletters etc. Special attention was given to those sources framing and influencing the political discourse at the European level, such as studies commissioned by DG Information Society and Media in the context of the i2010 initiative, documents of the European Technology Platform 'Networked and Electronic Media' (NEM), Commission staff papers accompanying Communications of the European Commission, and papers initiated by the Networked Media Systems Unit of DG INFSO.

(2) Statements from 25 experts could be taken into account for the final report of the project. The experts were contacted by e-mail and asked to respond to discussion statements attached. Discussion statements were part of the interim report of the project addressing visions and controversial socio-technical issues. The length of the nine discussion statements was between one page and seven pages. Experts were selected either on the basis of existing contacts or based on their scientific reputation in a given subject area. 35 experts were addressed by e-mail with one discussion statement each attached corresponding to their particular expertise ; they were asked to comment on this statement. The 25 responding experts in most cases used e-mail for their answer, some preparing comments of a few pages. In some cases, the feedback led to phone conversations and further written communication to clarify the feedback.

(3) On 26 June 2008, a workshop attended by around 30 people took place in the European Parliament, Brussels, on 'ICT & Media Industries in the Times of Web 2.0'. Members of Parliament, MEP assistants, commission staff, representatives of the European Technology Platform NEM and various other stakeholder organisations attended. The workshop was meant to get feedback from MEPs, to validate interim findings of the project, and to gain further insights from the four invited speakers and the expert discussions.

The three activities described above were the basis for the final report of the project.

Findings with Respect to Web 2.0, UGC and Media Industry

Web 2.0 as New Media Environment

Web 2.0 is shorthand for recent trends in web technologies, a changing networked media landscape with new business models and perceived changes in the way people communicate via the Internet. Web 2.0 can be regarded as an environment in which – based on a homogeneous underlying infrastructure – the local and the global, the stationary and the mobile, the private and the public, the commercial and the amateurish, playing and working can be arranged and composed in almost unlimited ways. This Web 2.0 environment presents countless business opportunities for media companies, telecommunications and IT industries.

Underlying the new media environment and the wealth of networked electronic media are technical innovations. The fundamental framework is provided by the open architecture of the Internet and Internet standards, which enable large-scale interoperability and globalisation of services and applications. Developments in hardware influence the creative content industries by improving the connectivity and performance of distribution channels. In parallel, Web 2.0 technologies have developed that embrace advances in client-server communication, advanced programming tools (web services, AJAX, API etc.), social software, and easy-to-use and inexpensive tools for content creation enabling new forms of communication, of media, and of co-operation (e.g. virtual communities). Web 2.0 technologies also enable increased user control over their media consumption: the desktop and the browser have turned into the user's powerful *media content control centre* allowing the personalisation of the networked media experience.

Use Generated Content Platforms

In Web 2.0 environments we see the emergence of many new types of networked electronic media. One class within these new media are so called UGC platforms. These new media are far from being non-profit. Although UGC is intuitively associated with a certain amount of creative effort of users, this understanding does not adequately cover the many ways in which users can be involved in the value production of networked electronic media – including even the involuntary production of commercially exploitable data traces.

User generated content in principle serves a niche market. UGC platforms host numerous niches. On the basis of aggregating and integrating niches, these platforms become a new form of networked media. The role of the user is not only to upload original content, but also to act as a broker between supply and demand by tagging, recommending etc. Today content on UGC platforms often stems from users *and* the media industries.

Whether UGC will be a threat to existing media players is still uncertain. There are some markets that have been heavily impacted by the rise of user generated content services. The most notable examples are encyclopaedias, the online adult industry and the market for music videos. In other markets UGC complements the existing supply. All major media companies are in the process of setting up UGC services or taking over successful grass roots initiatives.

The Audio-visual Sector

There are clear indicators that the Internet as Internet of media is turning into the growth motor of the media and entertainment industries. Traditional media migrating to the Internet are able to compensate for lower growth rates or losses in the physical world, but digital born content like video games is showing the highest growth rates. Forecasts see EU27 members from Southern and

Eastern Europe as most dynamic in the region. International comparison of media companies shows the importance of US-based global players (Google, MSN, Yahoo), but also the strength of national actors often belonging to incumbent media industries in Europe.

The audio-visual sector is being faced with upheavals due to digitisation. On-demand viewing is likely to be driven by TV-based platforms including IPTV rather than public Internet platforms. Radio broadcasting traditionally has a very strong regional element. Due to uncertainty on future standards, existing broadcasters are currently showing little interest in the transition to digital. The adoption of online radio is slow due to lack of adequate affordable broadband access in parts of Europe and the slow diffusion of suitable listening devices.

The Gaming Sector

After a period of comparative neglect, online video games are a rapidly growing segment of the mainstream media and entertainment sector with huge business opportunities. Web-based and mobile online video games are turning the games sector into a distinctive type of networked electronic media. Online video games have thus the potential to become mass media for everyone – not just for youthful male aficionados, but also for women and older people. On the one side, online games are competing with other mass entertainment media, TV and movies in particular, and, on the other side, with device dependent games (e.g. consoles).

The Internet enables efficient distribution platforms for online games and the typical approaches to profitable business on the Internet – subscription models, micropayment/advertising, and indirect revenue streams – are now being applied to the game business as well. The most important segment of online games in economic terms is still Massive Multi-Player Online Role-Playing Games (MMORPGs), meaning a persistent, always-on shared game world designed to be played by hundreds, thousands and even hundreds of thousands of users. The fastest growing segment within the online game segment is probably casual games. The ability to just drop in and spend a little time having fun is very convenient.

Issues, Visions and Policy Options

A Mobile Internet Good for Content Industries

Available facts and figures indicate that the importance of data services is growing in Europe. For content industries, the pace of change however is too slow. It would be beneficial for the content industries if European operators were to encourage more use of Internet standards. In particular a shift from expensive SMS to cheap e-mails with links to sites on the Internet could push the use of the mobile Internet. Lessons from world leader Japan suggest that increased competition and policy measures encouraging competition could help.

To bring about more competition and by this cheap mobile Internet services sooner, a *Europe-wide provision of wireless Internet services* allowing for Voice over IP – without roaming fees – is proposed as well as a *European spectrum regulation* beneficial for the content industries. Radio spectrum policy could provide support by the means of long-range unlicensed spectrum, the provision of pan-European licenses, the provision of licenses to new competitors, and the enforcement of technology neutrality with regard to radio technologies. Such spectrum policy could in particular focus on re-using 'beachfront' TV-spectrum.

Online Games and Educational Content

There have long been examples of computer games with learning value for children and adults. However, based on the evidence of time spent by users, online games seem to be overall more attractive and compelling than educational software. While users spend literally thousands of hours exploring and playing the former, educational software tends to be put aside after a few hours.

On the one hand, educational software can learn from online games. On the other hand, it might be in the public interest if game developers were willing to integrate educational elements in games primarily intended for entertainment. There might be greater potential for the use of educational software outside compulsory education, e.g. in further education and adult education.

To make optimum use of the potential benefits provided by educational programmes and games with educational elements, it would be useful to develop Europe-wide recommendations on uses and applications for various levels and types of school. As a measure to diffuse and optimise the utilisation of networked electronic media for educational purposes, a start could be made by inventorying such media and by creating platforms for the exchange of experience at the European level.

Yet No Need for New Payment Systems on Web 2.0

It is true that there is a lack of interoperability of cross-border standards, and of a common infrastructure for dedicated micropayment schemes. However, it is also true that the demand for dedicated micropayment systems has decreased. Current demand is at present not sufficient to push micropayment systems any further. As long as the lack of market demand is so obvious, there is no need for policy to intervene.

However, although 'free content' and advertising based business models dominate the World Wide Web today, and, as many payment schemes exist, the quest for new payment schemes and a micropayment infrastructure is not obsolete and may gain renewed importance in the near future, because current schemes do not support a wide enough variety of content, do not support payments to small content creators and person to person payments sufficiently. In the medium term, current interpersonal payment systems may develop towards more cash-like P2P payments. There is a need for policy to monitor these developments, to analyse the low value payment issue from a societal perspective and to reflect again the regulation of prepaid low value payment schemes.

Copyright Policies Relying on Forensic DRM

Forensic digital rights management (DRM) is gaining importance on Web 2.0: first, as a supportive technical mechanism within business models that sell 'DRM-free' content but wish to control circulation of copies and curb infringement of copyright; second, as a means intended to avoid uploading of unauthorized copies.

Also mere access providers are expected to apply this type of forensic DRM technologies for 'filtering'.

Despite the advantages of forensic DRM, the privacy risk is very visible. Other shortcomings are high numbers of false positives and false negatives. Forensic DRM does also not solve the problem that certain uses under copyright law are perfectly legal. Human moderation and judgement, either by the service provider or a third party, will stay necessary to make a distinction between illegal and legal use (think of the exceptions in copyright law). Current techniques can be helpful, but should not be implemented with the idea of an automated control mechanism in mind. Better techniques are needed before it is reasonable to enshrine this type of approach into law.

Exploitation of 'Prosumers'

The user's social capital in Web 2.0 environments consists of three value sources: personal profile and contacts, content contributions and data traces. This implies a risk of '*triple exploitation*'. The involvement of 'prosumers' in the value chain of Internet media therefore requires further reflection on adequate compensation, fair revenue sharing, and protection of the users' privacy. In particular, the large-scale monitoring and aggregation of a user's online personal and intellectual activities brings with it threats to privacy.

The Impact of the Semantic Web on the Future Media Internet

Semantic technologies have made considerable progress. The enabling technologies have now come of age, and important standards and specifications are available. Semantic web technologies have already proved to be useful in specific communities, among them segments of the media industries. In most cases, the applications are, however, still at an experimental stage.

Semantic technologies could reinforce a general trend, namely the automatic production of secondary media. Exploiting the semantic relations of resources, radio stations on the Internet or movie channels could harvest the Internet and elaborate programmes for their customers almost automatically without even employing personnel for this purpose. A step further, inference and reasoning machines would be able to autonomously generate new knowledge from that already existing.

The capabilities of semantic technologies to harvest interrelated content across resources and repurposing it raise crucial questions of copyright and digital rights management. In addition, the knowledge that semantic search engines would be able to collect about persons, their behaviour and their preferences might turn into a nightmare for privacy if not monitored and regulated appropriately.

The enrichment of the Web with semantics appears today as an evolutionary process linked with other developments: bridges between the 'syntactic web' and the semantic Web are required; also user involvement is crucial for the development of the semantic web because without user involvement the billions of documents will never be semantically annotated and because human intervention is needed as a corrective to automated processing of meaning.

The vision of a global semantic search engine appears, however, to be far from reality. Further improvements of search engines will not only depend on semantic descriptions based on ontologies. There are many more approaches to improving web searches, based on web mining, 'semantic web mining', 'observational metadata' or 'similarity detection'. Improved search engines are likely to take the best of all approaches and combine them.

Lack of Sound Statistics and Reliable Surveys

As others have noticed before (e.g. OECD), there is a lack of sound statistics and reliable surveys about the new sector of networked electronic media. There is no such thing as a European Networked Media Observatory. In particular, we do not know in much detail how media consumption and behaviour is changing, and there is still no economic measurement of the 'networked electronic media sector' in which many industries and many actors are jointly generating economic value. On one side, as technology companies (Telcos, ISP, Internet companies) tend to move up the value chain towards content, the convergence of providers would have to be taken into account. On the other side, the broader creative content sector producing original content in an amateur fashion, or in a semi-professional or professional way deserves more attention in media statistics and research.

Sources and References

STOA homepage: http://www.europarl.europa.eu/stoa/default_en.htm
ETAG homepage: http://www.itas.fzk.de/eng/etag/etag.htm
ITAS homepage: http://www.itas.fzk.de/

Böhle, K.; Rader, M.; Weber, A.; Weber, D.: Looking Forward in the ICT & Media Industries. Brussels 2008; online available on the STOA website at http://www.europarl.europa.eu/stoa/publications/studies/default_en.htm and the ETAG website at http://www.itas.fzk.de/eng/etag/document.htm (forthcoming)

Böhle, K.; Rader, M.; Weber, A.: ICT & Media Industries in the Times of Web 2.0. A Workshop Report. *Technikfolgenabschätzung – Theorie und Praxis* 17(2008)2, pp. 121-123; online available at http://www.itas.fzk.de/tatup/082/stoa-news.htm

The workshop presentations can be downloaded from http://www.itas.fzk.de/eng/etag/stoa-workshop-080626.pdf

Note

The project was led by Knud Böhle, senior researcher with the Institute for Technology Assessment and Systems Analysis, Karlsruhe. The project was supervised by Malcolm Harbour, MEP and Vice-Chairman of the STOA Panel, and Dr. Jorgo Chatzimarkakis, MEP. STOA staff in charge was Miklós Györffi.