MADE BY USERS.

HOW USERS IMPROVE THINGS,

PROVIDE INNOVATION AND

CHANGE OUR IDEA OF

CULTURE.PROBLEMS

AND PERSPE

CTI

VE

S

MIRKO SCHAEFER

SOFTWARE-BASED products can be copied, modified or further developed. Competent users have the necessary skills, tools and networks to develop modified products which were originally invented by corporate companies. In return companies will use the ideas of competent users. The results are products which are developed by both, users and companies: A Microsoft Xbox becomes a Linux web server, a Nintendo Gameboy can be used as a music editor and Sony's cute little AIBO turns into an electronic pit bull. Using technology (and that includes all the stuff we call media) means defining culture. The work of Dick Hebdige (1979), Arnold Pacey (1983; 2001), de Certeau (1984), John Fiske (1987), etc. shows that the concept of redesigning or redefining cultural artefacts is not only an issue of *new media*. But software and software-based products in a network society are, more than other cultural artefacts, suitable to get modified or redesigned.

In this paper I describe:

a) how the collaborative work of competent users is providing innovation and that this could create

b) an interactive market, where product definitions are possible only for a moment before these artefacts become modified or reshaped and that this raises questions concerning copyrights and democracy.

In conclusion my paper will argue that an interdisciplinary action between social sciences and computer sciences will be necessary to

understand the cultural practices in the digital age and to formulate terms, models and a theoretical framework for transferring a valuable concept of cultural freedom into the 21st century. The term cultural freedom describes the free access of citizens to cultural resources and their right to shape culture by using these resources. This should provoke a society wide discourse on cultural values, ethic issues and civil rights.

Technology changes culture

With the increasing diffusion and the decreasing price of computer technology, information and communication technology (ICT) became a common tool in our daily life. When the Commodore 64 was introduced in 1983, with its easy to learn programming language BASIC, kids started sharing technological knowledge. The computer subcultures of the early 80's, the Warez and Hacker scene, introduced new cultural values and new ways of cultural production. These communities were highly involved in shaping the culture of the internet generation (M. Castells, 2001, pp. 36–40; Rieder/Schäfer, 2001). The way people deal with technology, change products, share software, generate and distribute information is mostly rooted in this very way of life. Beside this the cultural practice is also technologically determined. Since it turns out that the first home computers were actually universal Turing Machines a process started which can't be stopped anymore. Computers are not intended to do *something*; they are rather able to do *anything that can be formulated as an algorithm*. Programming literally enabled people extend the functions of their computers, invent new functions, change existing ones and add new applications that they could also share within the network of users.

Today, access to ICT seems to be common—and this cultural practice of sharing and distribution—is spreading with the diffusion of the technology itself. This combination of a producer's culture rooted in the ICT communities from the 80's, the meritocratic culture of the universities, and a technology which inherits the determination of the new cultural practice, are causing many of the problems

we are facing today (e.g. privacy issues and copyright protection). These problems are profoundly affecting the organization of our democratic societies. It seems that politicians and companies would rather abolish the freedom of speech and the right for privacy than accept the challenges of digital culture[1]. Accepting these challenges would mean inventing new business models which are appropriate for the digital millennium[2]. And since this is not only difficult, but also changing existing business models, threatening established structures of power and politics, it seems easier to stick to an old—and old fashioned—way of organizing cultural industries, although the new technologies are already in use.

A discourse on technology and users

With the emerging internet culture the concept of encoding and decoding obviously had to be expanded. New concepts of describing media consumption relate to the user's ability to shape cultural products (Raessens, 2004). The dispositif of media consumption is now extended by technologies of cultural production by users. Users are now able to develop media content by themselves and the former mere monolithic dispositif becomes an interactive, complex system. By doing so, fans were constructing their own media and starting to have a much bigger influence on the production of their favourite media content (Jenkins, 1992). Another example for the activity of users is the growing area of information distribution, like weblogs and file sharing systems (Uricchio, 2003). And since Open Source/Free Software turned out to be a successful concept it became an object of innovation studies (Tuomi, 2002).

The increasing activity and production output of users in all of the areas is based upon three requirements that were established in the past twenty years:

- The ability to program the universal machine—the computer.
- The broad access of common people to computer technology (which includes decreasing prices of hardware and increasing availability of software)

- The possibility to connect with other users, to join communities whose issues can in turn presented to the public in order to get its attention.

These tendencies have already been described as the main principles governing the Internet galaxy (Castells, 2001). The collaborating community of users can be described as a form of collective intelligence (Lévy, 1997) and they constitute a new cultural practice in digital age. Similar to the rise of communication networks during the diffusion of the printing press in the 16TH century (Gisecke, 1998) we can describe networks of developers, users, fans and active citizens as emerging new communication systems. Analyzing technology from the perspective of the user constitutes a pragmatic approach. How do people deal with electronic consumer goods? What is their impact on technology? How this does affect our understanding of culture? User-made innovations serve as focus points for analyzing cultural practice.

Innovation through modification

Electronic consumer goods are increasingly based on computer technology. Since computers are universal machines it is not a strange idea to modify these products. This actually happens today, when products are introduced into the market. Consumers try to find other uses for object or how to solve problems which show up when using the product. 90% of the modified Playstation consoles were cracked because the kids want to play some copied games, just as DVD players get cracked because customers want to play every region code on their product. But the new robotic vacuum cleaner Roomba gets hacked because it offers expensive robotic technology for just $200.[3]

The Austrian Chris Kummerer hacked the Nintendo Gameboy and turned it into a music editor, so it can be used as DJ-tool. There are several enthusiasts producing gameboy music.[4]

The Microsoft Xbox is actually more than just a game console. Equipped with a hard drive, a stripped down version of Windows 2000 and a 733 Mhz Celeron, Xbox is comparable to a personal

computer. The Xbox Linux Project found a way to disable the "Microsoft-only" hardware and to run Linux on the console[5]. So the Xbox can consequently get used as a web server or a desktop computer.

The most popular Xbox hack is probably the Xbox Media Player, a tool which allows playback most media formats[6]. The original product does not include such features and even the simple DVD function requires buying an extra tool.

Also Apple's iPod offers huge opportunities to extend and modify the product, as do PDAs[7]. Sony's AIBO introduced in 1999 was quickly hacked by "Aibopet" who published his hacks on his website abohack.com. AIBO is now able to dance, to improve its English skills, to imitate the dog "Bender" and can be programmed through a simple editor.

Every product using computer technology—hardware or software—is open to modification. Such "mods" are regularly published and peer reviewed, on internet platforms. The personal computer that way becomes the space of cultural production and reception and provides the platform for cultural discourse. The reception of cultural products is not only reviewing them, but also revising them.

That means that if someone invents a software-based product, this product is actually a process, which enters a second stage of development, in the very moment of publication.

Technological and social innovation

The generation and distribution of new knowledge is not only innovating technology, but it also creates community and culture and can therefore be described as a meaningful use of technology (Selwyn, 2002). Another crucial part of this innovation process is providing broader access to electronic goods and closing knowledge gaps. Broader access, cultural freedom and independency from monopolistic companies are often the drive behind free/open source software projects and netactivism.

This is also a factor for users who are modifying products. An important motivation for Aibopet is to offer easy-to-handle tools so common

users will be able to shape their AIBO to suit their needs. Another factor concerning electronic entertainment goods is that companies are often not able to provide the necessary support. The websites of AIBO enthusiasts also serves the needs for competent support which Sony obviously can't provide. Moreover, the Aibohack.com example demonstrated that competent users do research and serious development work. A community, which we consider functioning as collective intelligence (Pierre Lévy), can be much more productive and innovative than a company's research and development department. In breaking up the hierarchic production process of electronic consumer goods, users are reclaiming cultural freedom, innovating products and bridging the digital divide.

Networks for organisation and representation

The computer is both a machine and a medium of communication and representation. It combines the capability of a machine to produce things with the ability to communicate and to represent. Computer networks serve several crucial aspects in digital culture like representation, communication and parallel working. The Internet itself emerged as the appropriate medium to organize and represent the new social structures and environments (Castells, 2002, p. 139). In case of the KDE project, a GNU/Linux based desktop environment, the internet was used for synchronised development with the help of a source code repository, to organize the workflow and as a tool for communication (e.g. IRC, ICQ, mailing lists). As Eva Brucherseifer, one of the project representatives puts it: "*Without internet, there would be no KDE*" (Brucherseiferer, 2004, p. 72). Similar to the GNOME project, KDE now tries to involve a broader public in developing the desktop environment by asking less skilled users to do beta testing and searching for bugs.[8] I think the logical step after a period of developing is to construct an open work process with endusers.

In case of Aibohack.com, the website became a mere platform of software distribution; other websites such as Aibo-life.org, Aibosite.com and Aiboworld.co.uk are community websites and

are offering possibilities to exchange ideas in a forum. During the conflict between Aibohack.com and Sony these community websites played a crucial role. When Aibopet, the person behind Aibohack.com, shut down his download area on Aibohack.com these communities were the first to support him and started online petitions, spreading the word and organizing a call to boycott Sony products. As shown in figure 1, the news concerning Aibohack.com was first announced in the user community and on early adopter platforms such as Slashdot.org and then spread through several online media and mailing lists to mainstream media worldwide. An article in LA Times increased the attention to Aibohack.com, because it was then sent to several mailinglists[9].

The Aibo case shows that for attracting the media's attention a few multiplicators such as the Aibo community websites and the peer-reviewed news site Slashdot.org are enough.

These examples confirm what Castells mentioned about networks and civil society. Besides serving organizational functions and representation they provoke a social transformation and participate in building a new society (Castells 2001, p. 143). The networks have proved by now their efficiency in organizing campaigns, reforming society, bringing up serious issues mainstream media did not dare to handle and changing the technology of cultural production.

Day	Media						
Oct 26	aibosite.com	aiboworld.co.uk	Aibo-life.com				
Oct 27	Slashdot.org						
Oct 28							
Oct 29	Heise News (D)						
Oct 30	New Scientist.com						
Oct 31							
Nov 1	LA Times	CNET News.com	ZDNet UK	IT Avisen (NO)	Internet Security News	Digital Copyright (CAN)	Interesting-people.org
Nov 2	ZDNet Japan	Wired/Yahoo JP	Wired	DMCA discuss, Netlime	Netlime		
Nov 3	Hispasec.com						
Nov 4	Linuxparty, hispalinux						
Nov 5	New York Times						
Nov 6	Ananova.com						
Nov 7	AP, dig Mass.	Midrange.nontech					
.....							
Dec 1	LA Times						

Press coverage (as found via Google.com) of the AIBO case between Oct 26th and Nov 7th 2001

Interactive market?

Modification or further development of products is not necessarily reserved to enthusiastic consumers. Companies might discover a business opportunity in improving products or offering tools for their modification. Last year the Taiwan-based company Friend Tech introduced the DreamX, a modified Microsoft Xbox. The former CPU up-grader improved the console by adding a faster processor, a bigger hard drive, a media player for almost all formats, better audio features, etc. The Hong Kong-based company Lik Sang was the world's leading distributor of mod chips until it was forced to stop selling these goods by lawsuits filed by Microsoft, Sony and Nintendo.

In the field of car tuning there is a whole industry growing out of the demand for *radical customized* products.[10] In the same way it would be possible to imagine companies doing nothing else than customizing electronic consumer goods. The radical customizing from the car tuning scene can be compared with the so called *case modding* and *overclocking* in the hardware enthusiast scene. Users modify the cases of their computers in various creative ways to look cool, they change and *overclock* their processors to max out the performance and they add water cooling systems to cool their chips[11]. Within several communities non-monetary based service develops in order to help other users get their products modified. On LAN parties you'll find people or garage companies offering case modding. The Xbox Linux Project provides a list of volunteers who are modifying the console for free.[12]

In several cases there is a kind of grey market emerging for services as DVD region code removing or implementing a mod chip into a console.

As long as someone is changing the case of a console it does not harm the business opportunity of the company which sold the case. But in case of software or hardware modifications which harm the business model (e.g. mod chips) companies react nervously. The only way to keep the grey market small is criminalizing business opportunities coming out of the demand for customized products.

Innovation is therefore often pushed into the fringes of legality. Although an interactive market would provide better products, more competition and more transparency, big companies try everything to keep inventors out of the game. Sony, Microsoft and Nintendo sued companies in Asia and Australia for producing mod chips, because using a mod chip—they argued—allows playing copied games. This argument seems insufficient since the Xbox Linux Project showed that using a mod chip doesn't necessarily imply the use of copied games, but rather a different, but nonetheless legal, use of the product. The fear of Microsoft, Sony and Nintendo regarding mod chips is closely related to their business model. They are selling subsidized hardware (game consoles) in hope of making money with software (games).

Problems and perspectives

Using software-based products offers new forms of cultural production and as thus the opportunity for reshaping cultural freedom and identity. Often companies deny that what they criticize in technology use is actually part of the technology itself. For example, the "pirated" copy that music companies and their lobbyists love to target is an inherent part of computer technology. If you are visiting a website, you are actually copying it down to your computer, if you are starting a programme from a network you are copying it, if you are sending a file to someone else, it is a copy you send. Distribution in the digital age means reproduction. A necessary consequence would be the revision of our copyright laws.

Companies now have the choice to adapt their production culture from a top-down model to an open process which offers customers and other companies the freedom to modify, change or further develop their products. Figure 2 shows possible scenarios of relations between companies and user communities. Companies and the institutions of public administration as well as the content industry have to be aware of these tendencies and to open up for a collaborative process which involves consumers/citizens.

Ignorance: In most cases companies ignore the fact that users are modifying their products. They pay no attention to the user's activities as for instance Nintendo ignores the Gameboy musicians.

Acceptance: In several cases they appreciate the fact that users are contributing and supporting the development of the product. In case of Aibohack.com Sony respects the cultural freedom of users in exchange for excellent support, which is provided for free. But Sony seems not to take part in the AIBO-communities. They are not actively participating in discussions and are not contributing knowledge, ideas, visions or technology to the community. There is no collaboration between Sony and AIBO users, Sony is just profiting from their activities and delivering nothing in return except not threatening their cultural freedom. In the same way George Lucas accepts the activities of Theforce.net and other Star Wars fan communities. As long as fans are not making money with their products they can get along. In cases of confrontation the argument centers mostly around copyright infringement.

Confrontation: In several cases (e.g. Microsoft, Sony, Nintendo vs. Lik Sang) lawsuits are successful in stopping the retailing of modified products or products which allow modifying. In other cases (e.g. Sony vs. Aibohack.com) a confrontation might actually harm the company. If a company is threatening the cultural freedom of their clients they should be aware that they are fighting against their own consumers.

Strategy	Examples
Ignorance	LEGO and LegOS; Microsoft and Xbox Linux Project, Nintendo and Gameboy music
Acceptance	Sony and aibohack.com (since Nov. 2001), Lucas Arts and theforce.net
Confrontation	Sony and Aibohack.com (Oct. 2001); Microsoft, Sony, Nintendo and Lik Sang (Dec. 2002)
Collaboration	NASA Clickworkers
Exploitation	

Possible relations between companies and users/companies who modify products

Software as cultural resources

The practice of perceiving software as a common is already established in the culture of free or open source software (Raymond, 1992). The transparency by which open source software is characterized, the dynamic collaboration of information distribution via weblogs and the culture of peer review are important features of Internet culture(Castells, pp. 37), features that turn out to become a menace to content industry and software monopolies.

The ubiquity of Internet culture is only a problem to those who prospered well under the old regime[13]. The Digital Millennium Copyright Act (DMCA) is an attempt to transpose the understanding of copyright from industrial into the digital age by ignoring the technological nature and culture of the latter. The emerging freedom of the internet and the digital culture, the advantages of a free flow of information, of transparency, of creativity of collective intelligence is now threatened by attempts to excessively regulate.[14] Therefore it is important to describe software as a cultural resource which is necessary for the cultural freedom, the democracy and the freedom of the information society.

The development of legal issues is even more questionable since the controversial directive on intellectual property rights passed the EU parliament in March 2004[15] and which was unfortunately confirmed in May 2004. A society wide discourse should discuss the ethical issues, the economical restrictions and the threat to democracy which are caused by these tendencies.

From a scientists perspective it is necessary to raise the issue of cultural freedom and democracy by analyzing the new cultural practice and the technologies in order to provide a pragmatic approach. From this perspective an interdisciplinary discourse of humanities and computer sciences could formulate theories, terms and models to change the status quo.

Culture is too important to leave the definition of its values to monopolistic companies and their lobbies

.

[1] Lessig, Lawrence: *The future of ideas*, New York: Vintage, 2002.

[2] Several consulting companies are already working in this direction, see as an example: Becker, Andreas; Ziegler, Marc: *Wanted. Ein Überlebensmodell für die Musikindustrie. Napster und die Folgen*, Diebold Deutschland: 2000

[3] Roomba Community: http://www.roombacommunity.com/

[4] Gameboy Music Club Vienna, Gameboyzz Orchestra Poland, 8bit Masters New York
more information: http://www.gameboymusicclub.org/news.html

[5] The Xbox Linux Project was founded by the german informatics student Michael Steil in 2002. It was sponsored by Michael Robertson the former founder of Mp3.com and CEO of Lindows OS. Robertson and Xbox Linux Project organized a competition for running Linux on a Xbox without using a modchip. In March 2003 the hacker Habibi_xbox disabled the Microsoft-only hardware with a buffer overflow and was able to run Linux.
The project's online representation is http://xbox-linux.sourceforge.net
See also:
Becker, David: *Hacker cracks Xbox chllenge*, in News.com, 31.3.2003, online: http://news.com.com/2100-1043-994794.html, (12.08.2003)
Golem.de: *Wie der Pinguin auf die Xbox kam, Interview mit Michael Steil und Milosch Meriac*, in *Golem.de,* 31.12.2002, online: http://www.golem.de/0212/23288.html, 27.8.2003

[6] Xbox Media Player: www.xboxmediaplayer.de

[7] iPod Hacks: www.ipodhacks.com,

[8] KDE tries to close the gap between users and developers with the so called Quality Team: http://quality.kde.org/
The KDE project: www.kde.org ; The GNOME project: www.gnome.org

[9] This article is by the way an interesting example for the internet as a common memory. Although it is not on the website of LA Times anymore, it still can be found via the archives of different mailinglists.
P. C1; Wilson, Dave; Pham, Alex: *Sony Dogs Aibo Enthusiast's Site*, *LA Times*, 1.11.2001
http://www.latimes.com/business/la-000086726nov01.story?coll=la%2Dheadlines%2Dbusiness (not online)
Short version on: http://www.acm.org/technews/articles/2001-3/1102f.html#item9
Copy of this article on nettime archive:
http://lists.microshaft.org/pipermail/dmca_discuss/2001-November/000698.html

[10] The term radical customizing is related to car tuning and common for describing modifications on cars in the car tuning culture. It is interesting that the car producing industry first tried to fight car tuning.

[11] See examples of hardware modding on www.casemodgod.com and www.hardforum.com

[12] http://xbox-linux.sourceforge.net/docs/usershelpusers.html

[13] As Niccolo Machiavelli puts it: *Innovation makes enemies of all those who prospered under the old regime, and only lukewarm support is forthcoming from those, who would prosper under the new.*

[14] For more information: Lessig, Lawrence: The Future of Ideas, 2002

[15] http://www.ipjustice.org/CODE/021604.html

Literature

Brecht, Bertolt: *Der Rundfunk als Kommunikationsapparat*, in *Pias, Claus et al. (eds.): Kursbuch Medienkultur*, Stuttgart: DVA, 1999, p. 259 –263

Castells, Manuel: *The Internet Galaxy*, New York: Oxford University Press, 2001

Certeau, Michel de: *The Practice of Everyday Life*. Los Angeles: University of California Press, Berkeley, 1988, first published in English: 1984

Giesecke, Michael: *Der Buchdruck in der frühen Neuzeit*, Frankfurt a.M.: Suhrkamp, 1998

Graham, Meikle: *Future Active: Media Activism and the Internet*, New York: Routledge, 2002

Hall, Stuart: *Encoding/Decoding*. In: Hall, Stuart (Hrsg.): *Culture, Media, Language*, London, (1980),p.136

Hebdige, Dick: *The Meaning of Style*, London: Methuen, 1979

Fiske, John: *Television Culture*, London: Methuen, 1987

Jenkins, Henry: *Textual poachers. Television Fans & Participatory Culture*, New York: Routledge, 1992.

Jenkins, Henry: *Renegotiating a Truce*, paper unpublished, 2003

Jenkins, Henry: *Interactive Audiences?*, in: *Harries, D. (ed.): The New Media Book*, London: BFI Publishing, 2002

Lakhani, Karim R.; Wolf, Robert G.: *Why do hackers, what they do. Understan ding Motivation Effort in Free/Open Source Software Projects*, 2003; online: http://ssrn.com/abstract=443040, (last accessed 30.3.2004)

Lessig, Lawrence: *The Future of Ideas*, New York: Vintage, 2002

Lessig, Lawrence: *Free Culture*, New York: Penguin Press: 2004, online: http://www.free-culture.cc/

Luthiger, Benno: *Alles aus Spaß? Zur Motivation von Open Source Entwicklern*, in *Gehring, Robert A.; Lutterbeck, Bernd (Eds.)*: *Open Source Jahrbuch 2004* online: www.think-ahead.org (last accessed 30.3.2004)

Pacey, Arnold: *The Culture of Technology*, Cambridge: MIT Press, 1983

Pacey. Arnold: *Meaning in Technology*, Cambrindge: MIT Press, 2001

Raessens, Joost: *Computergames as participatory media culture*, in *Raessens, Joost (ed.): Handbook of Computer Game Studies*, MIT Press, 2004

Rieder, Bernhard; Schäfer, Mirko Tobias: Der 80er Jahre Kern der Sache, Sinnhaft 10, online: http://www.sinn-haft.at/nr_10/nr10_rieder_schaefer_80er_jahre.html, 2001

Raymond, Eric S.: *The Cathedral and the Bazaar*, 1992; online: http://www.catb.org/~esr/writings/cathedral-bazaar/

Robles, G., Scheider, H., Tretkowski, I. & Weber, N.: *Who Is Doing It? A research on Libre Software*, 2001; online: http://widi.berlios.de/paper/study.html (last accessed: 30.3.2004)

Selwyn, Neil: *Defining the ‚digital devide': Developing a Theoretical Understanding of Inequalities in the Information Age*, Cardiff 2002. Online: www.cf.ac.uk/scosi/ict/definingdigitaldivide.pdf

Tuomi, Ikka: *Networks of Innovation*, New York: Oxford University Press, 2002

Uricchio, William: *Cultural Citizenship in the Age of P2P Networks*, 2003; online: http://www.hum.ku.dk/modinet/Conference_aug/Uricchiofinal.pdf

An earlier version of this paper was presented at the Bilbao Cyberart Conference 2004