TABEA LURK, BERN UNIVERSITY OF THE ARTS / AKTIVEARCHIVE ON THE AGING OF NET ART WORKS

ALTHOUGH THE INTERNET MAKES US BELIEVE THAT AS USERS WE ARE ALWAYS SERVED WITH UP-TO-DATE DATA, NOT A FEW NET-BASED ART WORKS ARE ALREADY NO LONGER ACCESSIBLE DUE TO THEIR HISTORICAL PROGRAMMING, OR THEIR ORIGINAL APPEARANCE IS CHANGED BECAUSE OF TECHNICAL ADAPTATIONS. THIS ESSAY ADDRESSES THE QUESTION OF WHICH INTERVENTIONS ARE LEGITIMATE IN ORDER TO SECURE A WORK AND WHICH CONSERVATIONAL MEASURES ULTIMATELY DAMAGE THE WORK IN ITS HISTORICAL CONDITIONEDNESS. LURK'S TECHNOLOGICALLY MOTIVATED REFLECTIONS EXPLAINED WITH ILLUSTRATIVE EXAMPLES ARGUE FOR MEASURES OF PRESERVATION THAT MUST BE NEWLY DEFINED FROM ONE WORK TO THE NEXT. THIS PRESUPPOSES A FLEXIBLE APPROACH TO THE TERMS OF ORIGINALITY OR AUTHENTICITY.

1. INTRODUCTION

The Internet, only just forty years old, has developed, especially in the last decade, from the more or less closed, highly developed research network Advanced Research Project Agency (ARPA) into a colorful marketplace, in which art, as we know, has also found its niche.[1] As so-called net art, it invites us to become flaneurs[2], to interact (Studer / van den Berg)[3] and participate (Gees)[4], or it seeks to shake us up with artistic actions (Übermorgen.com[5]) and dispel some of the shininess of all too smooth surfaces. Mark Napir, for instance, breaks down HTML-based websites into their basic components in the work **Shredder** (1998)[6], creating an impression as though the sites have been run through a paper shredder.

Since the mid-1990s, primarily the graphical user interface of the Internet – the so-called World Wide Web (WWW) – has appeared as an artistic medium, the technical boundaries of which have been tested by artists like Vuk Cosic[7] and others, for example with computer programs that (formerly) made the browsers or computers of their users crash.[8] In addition, there is an exploration of legal boundaries and the complex relationship between copyright-protected contents and a neoliberal attitude of distributing books, texts and images on the Internet. This is evident in net works like **GWEI – Google Will Eat Itself**[9] (2005) or **Amazon Noir – The Big Book of Crime**[10] (2006 / 07), both by Übermorgen.com. The local transgression of territorial lines of demarcation in both real and virtual space has been impressively staged, for example, by Heath Bunting with **BorderXing Guide** (2001).[11] The artist not only documented apparently illegal border crossings in the mode of performance, but also regulated all net access through the respective location zones of the visitor-clients. A completely different reading of site specificity, on the other hand, was offered by Anja Kaufmann with her audio project **RadioSolarKompass** (2005)[12], in which a computer program listened to roughly 250 online radio broadcasts and played their sound material independently from the respective time of day (space-time balance). The artist coupled the moment when the **RadioSolarKompass** switched from one radio broadcast to another to the sunrise in the respective time zone.

As these few work examples already show, net art uses the Internet not only as a medium, but also as location and as material.[13] Unlike the event-type actions of many telecommunications arts since the

1 Verena Kuni, **netz.kunst. Jahrbuch des Instituts für moderne Kunst '98 / '99**, Nuremberg 1999. Tilman Baumgärtel, **[net.art]. Materialien zur Netzkunst**, Nuremberg: Verlag für moderne Kunst, 1999. Peter Weibel et al. (Ed.), **Net_condition: art and global media**, Cambridge (Mass): MIT Press, 2001. Nina Kahnwald, **Netzkunst als Medienkritik. Neue Strategien der Inszenierung von Informationsstrukturen**, Munich: kopaed, 2006.

2 Verena Kuni, «Die Flaneurin im Datennetz. Wege und Fragen zum Cyberfeminismus», in: Sigrid Schade, Georg Christoph Tholen (Ed.), **Konfigurationen. Zwischen Kunst und Medien**, Munich: Wilhelm Fink, 1999, p. 467 – 485, here p. 467.

3 http://www.vuedesalpes.com [03.2010].

4 http://www.communimage.ch [03.2010].

5 http://www.ubermorgen.com/2007 sound.html [03.2010].

6 http://www.potatoland.org/ shredder [03.2010].

7 http://www.ljudmila.org/~vuk [03.2010].

8 A broader overview of the motif of viral power of destruction is presented by the touring exhibition **I Love You** (in the Museum for Applied Art in Frankfurt am Main, 2003, developed by digitalcraft, cf. http://www.digitalcraft.org/ iloveyou/index.htm [03.2010]).

9 http://www.gwei.org [03.2010].

10 http://www.amazon-noir.com [03.2010].

11 http://www.irational.org/ borderxing [03.2010].

12 http://radiosolarkompass.org [03.2010].

13 Inke Arns, «Unformatierter ASCII-Text sieht ziemlich gut aus – Die Geburt der Netzkunst aus dem Geiste des Unfalls», in: Thomas Wulffen (Ed.), **Der gerissene Faden. Nichtlineare Techniken in der Kunst**, Kunstforum International, Vol. 155, June / July 2001, p. 236 – 241.

1960s and 70s, however, net art is usually distinguished by being uncompleted in time and space. Most works exist in progress, i.e. without a specific point of conclusion. Many artists continually or sporadically update the appearance form of their work and continuously appropriate more recent forms, formats and strategies of communication, thus expanding their own scope. In this way, net art continues several trends of the artistic avant-garde of the 20th century at the same time. The classic work concept, for example, is dissolved not only figuratively, but also quite literally: the net art work always becomes visible in a location that is not identical with the storage place.

2. FORMS IN WHICH NET ART AGES

On the whole, artistic strategies of appropriation on the Internet are thus comparably heterogeneous as in other artistic media, but the media-immanent marginal issues are different in the aging of the works. It is interesting that various functional errors point directly to the continual progress of net technologies. Who is not familiar with the error message 404, which memorializes the hour of the birth of the Internet at CERN in referring to a non-(no longer) existent website[14], or the placeholder for image material that is not (no longer) available? The perception that a website looks distorted or behaves strangely is also familiar to many people.

In short, the destructive impact of the Internet reveals itself to the user everywhere, where websites unexpectedly exhibit gaps, where the data transfer runs into obstacles, or where entire works become inaccessible. In conjunction with the preservation of art and cultural goods, we usually discuss these kinds of phenomena under the keyword damage or degradation. Whereas some net art works evince unmistakable errors, other works and websites vanish from the Internet entirely. Yet these traces and processes of aging have little in common with the classical degradation phenomena of real-world art works: in general, they are not due to wear and tear in the classical sense or to false storage, climate changes and (physical) transport damage. Nevertheless, seemingly omnipresent and timeless net art obviously does not remain immaculate either. Those who work on the subject of net art are familiar with the phantom pain of vanished works and the frustration of having neglected to make screenshots in time.

As early as 2001 Bank & Jeron formulated the (self-) critical thesis in their **Anmerkungen zur Konservierung von Netzkunst** [Remarks on the Conservation of Net Art] that conserved net art is a bit less net art than conserved painting is still painting.[15] The two artists see a possible solution

14 Why the number 404 is pertinent is evident in the work **404.jodi.org.blaster** (1998) by the artist group Jodi (http://404.jodi.org [03.2010]) and the EU project **404 Object Not Found** (2002/03). The project was realized and discussed by medien_kunst_netz dortmund, an association consisting of the Museum am Ostwall, the art association hartware medien kunst verein (Dortmund), the Office for Culture of the City of Dortmund and the University of Dortmund (http://404project.hmkv.de [03.2010].

15 (Joachim) Blank, (Karl-Heinz) Jeron, **Anmerkungen zum Konservieren von Netzkunst** (2001), cf. http://www.joachimblank.com/texte/conserve_netart.pdf [12.2008].

in the model of patronage, in which a specific kind of maintenance agreement is concluded between artist and museum.

The following observations on the preservation of net art deal less with the supposedly deficient character of conservation than with the changing understanding of (net) art work and work environment (Internet). With net-based art works, the monolithic work concept is replaced by a modular continuum of work, which opens up new options for agency. Parts of the work and components of the work, system or net environment are differentiated here. For this reason, we introduced the term of the «work logic» to analyze these components and their coherency.[16] The work logic identifies the core components of the art work and describes the interlocking of the digital modules involved. This is documented in terms of how it is anchored in the system environment and in relation to the overall artistic aesthetic concept. In relation to error zones in net art works, this means that local and external disturbance sources can be distinguished from one another. Whereas local problems occur on singular computers, i.e. on the work server or the client server, external error zones are context sensitive. This context sensitivity is substantially due to the spread of global search engines and metadata services like Google. Since about 1999 / 2000 more and more works include the contents of these external data providers in their own work logic. This results in dynamic areas in the art work, within which the display contents are newly assembled daily. At the same time, however, disturbances (in the art work) become more frequent, due to changes in the net environment (the Internet), which no longer occur in the work itself. Because of the lack of access, it is hardly possible to fix them in the core. However, current technologies enable the development of documentation and translation tools, which bridge the gap between obsolete, but authentically preserved work components and the current net environment.

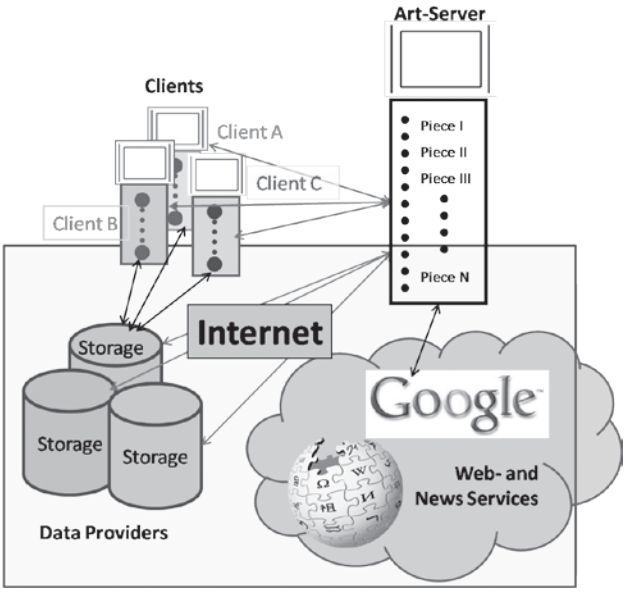
In general, the moment of closure suggested here supplies an important factor for the development of conservation strategies. This enables distinguishing between at least three types of net art:

Net art works of the first type are distinguished by a certain closure. The work is usually available in the form of static or script-based HTML websites.

In the second type, artists use more open work structures, in which external data sources can be integrated. The processes for playing out the work are executed almost entirely on the server that houses the work.

With the third type artists outsource the transfer of media data to the client. The server then only supplies the rules for downloading and playing or displaying text, image, audio and video contents, which the client then executes. However, then both server and client require free access to the Internet to provide the needed contents. The work exists more and more in a distributed communication process, resulting in a kind of trian-

16 «We» means here the team that is concerned with the framework conditions for the conservation and restoration of new media in conjunction with the national research project AktiveArchive.



gle relationship between client, work server and external data providers, i.e. the Internet. Even though the typology outlined above largely correlates with the further development (genealogy / generation sequence) of net technologies and is thus historically conditioned, it remains to be determined how suitable these differentiations are to trace the art historical genesis of net art. In any case, the categorization proposed here is inspired by media technology and does not imply a value judgment: neither historically nor aesthetically nor conceptually.

3. MEDIA FLAWS AND THRESHOLD SITUATIONS

But back to the flaws and the question of the degradation of net art. What appears simply irritating at first glance and annoys artists and art historians and critics equally, may hold an interesting added value for the media theory view. It can be demonstrated that especially the more or less spontaneously occurring flaws indicate the culturally coded threshold situations that Georg Christoph Tholen, for example, has characterized as «caesura».[17] Media caesuras reveal the break in the technical continuum, thus marking the creeping progress taking place seemingly unnoticed behind the smooth user interface of the screen. Intelligent, fully automated mechanisms essentially ensure that the unpracticed user is not even aware of the technological shift. Dysfunctions in art works therefore usually only gradually become visible. For example, hardly anyone consciously remembers the day when the Internet service Google changed from the text-based descriptive language HTML (Hypertext Markup Language) to the script-oriented macro-language JavaScript.

To be able to connect these kinds of technologically induced changes with media-technical threshold situations, a more precise analysis of error causes is needed. Of course, not every bug in a net art work can be described as an indication of a «caesura» in Tholen's sense. Instead, the term caesura should be applied only to the modifications in the overall technological structure that occur when, for example, a new standard is introduced. Media thresholds mark serious changes. If a media caesura becomes acute, a dislocation results in the digital environment of the art work. Smooth functioning is prevented. Then we can speak of aging.

17 Georg Christoph Tholen, **Die Zäsuren der Medien. Kultur-philosophische Konturen**, Frankfurt: Suhrkamp Taschenbuch Verlag, 2002, p. 9.

3.1. PRESERVATION ISSUES

The shaping force of the carrier or communication medium of the Internet not only imposes framework conditions of design and arrangement on art, as is also the case with other art forms. It even has a subsequent effect on the created objects. Net art is exposed per se to a dynamic environment. The functionality and sometimes the visible presence of many Internet art works depends more directly and unpredictably on external factors than is true for computer-based offline installations, for example. In terms of preservation (and also marketing, as is discussed in the present research project **Owning Online Art**), this poses new challenges.

In the following, first the frequently occurring error sources will be explained, including the dependency on external data sources, metadata providers, communication formats, commercial applications and community portals. This will be followed by a look at the prospects of individual, more recent practices of preservation and reanimation. If technical developments are also taken into consideration, as they are currently beginning to emerge in the field of virtualization and emulation and in the context of legacy research in computer science, there is reason to feel more confident about sustainable conservation approaches for net art.

3.1.1. Dependency on External Data Sources

Since the aesthetic rearrangement of contents from the Internet is one of the most widespread net art strategies, changes to access interfaces or conditions generally affect not only single art works, but a whole series of works.

One striking example for the net-based fragility that arises through the integration of external data sources is provided by John Klima's work **The Great Game**[18] (2001). Among other presentations, it was included in the net art exhibition **Shrink-to-Fit** (2004), which was curated by Reinhard Storz and realized in cooperation with the Museum for Communication in Bern.[19] Conceived as a computer game, the work uses constantly updated maps that recorded military activities of the allied forces and the US during the Afghanistan War in 2001. With a sarcastic undertone Klima integrates replicas of the real battleground in the artistic online game. Since the data source has vanished, the work no longer functions either. Instead of updating the data source, as other artists frequently do, John Klima obviously decided to leave the torso of the work as a kind of memorial online. In 2003, with the emergence of another conflict zone, he shifted the work (concept) to the then current **Playground: Iraq. TGG – Iraq Expansion Pack & Campaign Maker v1.0**[20] (2003) can thus be understood as a kind of update, which simultaneously reflects on / satirizes the Third Iraq War.

3.1.2. Dependency on External Metadata Providers

In addition to the use of clearly defined, fixed data sources, many artists integrate the services of

18 http://www.cityarts.com/greatgame [03.2010].

19 http://www.xcult.org/shrink [03.2010]. **Shrink to Fit** takes up the intention of encouraging users to actively participate, which was widespread among net artists of the first and second generation. The interface becomes the space of action of the exhibition. The graphical exhibition portal can also be integrated in one's own website.

20 Cf. http://www.cityarts.com/iraq [03.2010].

external information providers in their works. The reason why this is so popular is that the contents are always up to date and available in large amounts and continuously. There are also additional aspects, such as the abundance of the available media formats (text, image, moving image, sound, animation), the way the information is semantically structured, which makes it easy to find contents, and the capacity to adapt to different languages. The supplied data can also be integrated automatically, for example through RSS feeds. Another point may be the presumed postponement of legal issues, since the question of using copyright protected material seems to have been undermined to some extent.

However, since grabbing and reassembling multimedia contents from the Internet seems to generally play out in a gray area of legality, it is hard to expect service providers to guarantee access. As private service providers they define their conditions for use, i.e. access to the data (communication format and protocol, amounts of data, etc.). They can define the purposes of the (re-) use of the contents.[21] News services usually tolerate parasitic appropriation by artistic data pirates – at least as long as they are not criticized or attacked for their services.

An illustrative example of dexterity in accessing various information service providers is found in Marc Lee's **Breaking the News. Be a News-Jockey**[22] (2006). The work, conceived as an expansive room installation, accesses originally sixteen news services, whose contents are composed so that they result in a seemingly endless, interactive film.[23] The user can enter a search term in a pre-defined search field. Then about twenty different **news modules** forward the queries to the relevant data providers. The display software installed on the client receives information from the work server about where the corresponding referenced contents can be downloaded from the net.

Whereas with an art work like **Breaking the News** the loss of one data provider would merely limit the aesthetic diversity and make the work boring, the same defect can lead to a total outage for other art works. For instance, it is not difficult to imagine what it would mean for the work **onewordmovie**[24] (2004) by Beat Brogle and Philipp Zimmermann, if Google no longer supplied images (references). At the request of a user, the work generates an interactive film, which arranges image material referenced by Google into a virtually endless art film.

The inclusion or interpretation of meta-information from external data providers makes the art works dependent not only on the situation, but also on location and computer. Many service providers **optimize** the results by tuning the responses to search queries. For this they use not only their internal web statistics, but also certain computer settings, such as location, time zone, country and language settings, and other parameters such as client profiles, which are temporarily cached by the services. In addition, an ID number is fre-

21 See e.g. Google's Terms of Service: http://www.google.ch/accounts/TOS [03.2010].

22 Since 2008 there is also a simplified web version of OAMOS (http://www.oamos.com [03.2010]), which does justice to the popularity of the work.

23 The services addressed include Amazon, ccMixter, Flickr, Google, Google Images, selected RSS-Feeds, Synonyms, Technorati, selected Webcams, Wikipedia, Yahoo, Yahoo Music, YouTube, and SonicSquirrel.

24 http://www.onewordmovie.ch [03.2010].

quently assigned to the request. This allows the server-side documentation of user behavior. The client automatically communicates these parameters with every request. Remember, for instance, the automatic book suggestions that Amazon provides for customers, even if they are not (permanently) logged in on the site.

3.1.3. Dependency on Communication Format and Commercial Applications

It is additionally not unusual for browser-specific settings to be communicated, such as the type, the version of the browser, language and user preferences and the plug-ins used. This and further information contributes to regulating the format of communication between server and client. The relevance of the communication format is evident, for example, in Cornelia Sollfrank's **net.art Generator**[25] (2003). For the **net.art generator** (NAG) not only processes image material from Google-Images and is thus dependent on an external data source as described above, it also only understands a certain format: HTML. In order for the original NAG script to be executed, the parameters provided by Google have to be written in HTML protocol. Since the corresponding communication parameters that could clearly identify this information are not explicitly defined in the NAG script, however, the Google search engine assumes it is serving an up-to-date browser. There is, in fact, a Mozilla browser installed on the NAG web server, which is visible for Google as a communication partner. Missing parameters or undefined gaps, which were unproblematic during the development period because there were frequently no alternatives at all, are among the classic problem cases in old scripts. They first become a problem when the format or communication conventions change. Since Google switched from HTML to JavaScript, the img-agent in Cornelia Sollfrank's NAG script is no longer able to simply understand the response; the image production falters.

3.1.4. Dependency on Community Portals and External Applications

The matter becomes even more complex, when whole applications of a commercial service are directly integrated into the art work, or when the works are situated as a whole on a community platform like Facebook, YouTube or Flickr. The respective providers are responsible for the maintenance of their servers, which takes the burden off the artists. In general, however, access permissions are limited. In the case of system errors or updates, in other words when the art script and the updated server environment become (partially) incompatible, access permissions are often insufficient to lastingly conserve or restore the work. In addition, many smaller applications are limited to only a brief duration and are therefore only suitable specifically for certain actions. Some artists integrate commercial applications into their websites for certain works or events, for example for sending, processing or forwarding short messages, because it is simply

25 http://net.art-generator.com/src/gen.html [03.2010]. The work was renamed in 2008, because the fifth net.art generator (NAG) is no longer entirely functional, and the fourth NAG turned out to be the main work. The work is now called NAG5. Since 2007 there is even a museum version/installation (see: http://www.youtube.com/watch?v=43y2k5j7oIU [03.2010]).

more economical to take advantage of a service for a short time than to program the correlating functionality themselves.

A prominent example of this kind of temporary setting is found in the net art action **HelloMrPresident** (2001), which Johannes Gees realized for the World Economic Forum in 2001.[26] The work for Internet, SMS and laser consisted of a web front-end and a local laser installation in Davos. The public, excluded from the summit meeting, was able to send short messages via mobile phone or the Internet to a certain news portal curated by the artist. The messages were transmitted from there to the laser in Davos, which projected the texts onto a hill across from the conference location. The transmitted messages were also archived online. Although the news system integrated in the website initially remained visibly accessible and the messages could be read there, the work vanished from the net completely following a hacker attack. Today the former domain redirects to the artist's website, where documentary photos and videos are stored. A similar situation applies to Gees' **HelloWorld** (2003), which further developed the principle. Users around the world could participate in a temporary installation, which transmitted text messages to building walls in Bombay, Geneva, Rio de Janeiro and New York at the same time.[27] In cases like this, the Internet functioned not only as transfer medium and archive, but also offered a website displaying the art action with four webcams. Today the domain is in different hands and can only be recalled through documentary records. This is also a typical problem case, for which the artist can hardly be blamed. Johannes Gees and others develop temporary work forms and often already take the documentation of the actions into consideration in the conception phase.

3.1.5. Social Networks

A final aspect for external error sources to be mentioned here are social factors, which hold a potential for danger that is not to be underestimated. They occur within artist groups as well as among the curators of the few public institutions that have entered into the so far vague business of net art. Friendships break, artist collectives drift apart or are disbanded; curators, IT staff and technical support leave an institution, after which art servers are left running more or less unattended until they are hacked or break. Updates are run, frequently automatically, but resources are rarely available for continually testing whether the works can still be played. In addition, to the extent that there is a transfer of usually personalized knowledge at all, it is certainly not always transferred or made accessible in comprehensible documentation. This makes maintenance more difficult for the following generations.

Relevant examples are widely known in the community and need not be specifically mentioned here. However, another special case should be mentioned, which fits especially well in this category of socially determined problem zones in net art and is work-specific at the same time:

26 http://www.johannesgees.com [03.2010].

27 http://johannesgees.com/?p=142 [12.2008].

Birgit Kempker's **Sphinx**[28] (2004). Despite its programmed automatisms, by definition the art work is bound to the authority and presence (!) of the artist, since the questions that users ask the Sphinx can be answered either by the artist herself or by the Sphinx machine programmed by Peter Dittmer. The work thus stages a vague tension between a media-supported interpersonal dialogue and a **purely** human-machine dialogue. The artist already points this out on her website, when she continually fades in the text at the upper edge of the **Sphinx**: Who will answer – Sphinx or machine? And the answers do not follow immediately at all. The moment of asynchronicity between question and answer raises the tension. The artist decides who answers which question. She also reserves the right to intervene in the machine dialogue, even when the questions have already been delegated to the machine **Sphinx** – for example, by intervening in the artificial sestinas.

3.2. LOCAL ERROR SOURCES

Net art works are not only susceptible to external fluctuations in the net environment, however. Changes frequently also occur in the immediate environment of the art work, i.e. the storage and display computers, for example when software or system components are updated. What is primarily intended to protect the storage or display computer endangers the existence of code-based art works again and again in a wholly elementary way. Some well-intentioned security updates hold undesirable side effects. Software producers generally offer updates to close unsecured interfaces or to prevent data corruption due to insufficiently programmed scripts. For the art works, however, this can mean that certain functions or subsections of the scripts can no longer be run without translation tools or are invalidated.

Several art scripts can be mentioned as examples, which were created in the late 1990s in association with Andrew C. Bulhak's **Dada Engine** (1996).[29] The Dada Engine is a randomly controlled text generator that can be modified without great exper-tise in programming, and which spread relatively quickly throughout the artist community. Derivatives of the artistic code as well as the **original Dada Engine** are still available for downloading. They can be installed on the server side and integrated in one's own website. However, some of the scripts can no longer be directly executed due to modified error tolerances on up-to-date web servers. There are various approaches to restoring these code fragments. In some cases it is sufficient to correct single signs – e.g. by replacing semicolons with commas or filling in previously omitted parameters.

Another problem occurs when a provider no longer supports the software used by an artist. In general, at first only the support for the relevant application or software is stopped. Sooner or later, though, the product consequently disappears from the market. Software providers cannot be blamed for this, to the extent that their licenses are

28 http://www.xcult.org/sphinx [03.2010].

29 A **bugfix release** (Version 1.01) was published on 29 April 1996, the current version of the **Dada Engine** can be found at: http://dev.null.org/dadaengine [03.2010]. The scripts referred to here can be found at: http://dev.null.org/dadaengine/manual-1.0/dada_toc.html [03.2010].

usually endlessly valid, but guarantees are only granted for current products, i.e. for a limited period of time. In cases like this, Open Source software is more robust than proprietary software products, because the code is open. This means it is more easily adaptable than commercial products. In terms of the dependency of certain computer art works on a certain system environment – meaning hardware components (computer type, graphic cards, printer interfaces) and software components (operating system, software and driver libraries) – current virtualization and emulation technologies and the development of collections with reference operating systems and software now offer a feasible solution strategy. They are to be supplemented as needed with further security measures. However, this applies more to current systems and parts of net art, whereas early software art works, in particular, starting from the mid-1980s, remain only very conditionally executable.[30]

The case is similar with ties to a certain computer platform. This dependency can be noted on both the server side and the client side. Although many applications are nominally available for PCs and Macs, run errors occur again and again, when the script was created for a different computer type.

3.2.1. Partial Disruptions in the Display

The reception of browser-based art works is additionally impaired by pop-up and ad blockers and by various filters, which are intended to shield the user from annoying messages. It is not unusual for them to also block the direct reception of net art works, where the narration plays in different browser windows that open one after another. For instance, Frédéric Moser and Philippe Schwinger presented in their digital walk through a forest, **Eine Aporie**[31] (2001), which was also part of the net art exhibition **Shrink-to-Fit**, animated images that repeatedly opened new browser windows. If the windows in these kinds of works are no longer directly opened, because permission must first be granted, the immediacy desired by the artists is undermined.

Even more difficult to deal with are applications that use complex, interactive elements for dynamic navigation (see **The Ram Show** below) or works that use specific media players or interpreters. Whereas navigation is generally still possible at the time of creation, the rendering engine and other browser-immanent display elements change so much over the course of time that navigation eventually becomes impossible.

The rapid display of dynamic contents also falls into the area of aesthetically modified playback. Essential triggers for this effect are better Internet connections (bandwidth, bitrate) and more powerful performance of the computers.[32] As early

30 An important aspect is access to the source code. Although it is frequently possible to make old scripts run to some extent even in a compiled form, special functions – like converting or saving the generated data in today's formats instead of in the data format specific to the software – can only be adapted if the source code is available.

31 http://www.xcult.org/shrink/art/schwi_mo/schwi_mo_d.html [03.2010].

32 The problem of playing speed becomes complex especially in the desktop field with playing interactive CD-Roms and DVDs, because many artists of the first generation forgot to specify the fps (frames per second) or purposely set the specifications exaggeratedly high: the contents could never be played that quickly. In the field of net art the regulation of playing speed is regarded as one of the simpler problems, because it cannot be invasively regulated by defining the data rate.

as 2005, the net artist Olia Lialina pointed out in a lecture that her work **My Boyfriend Came Back From the War**[33] (1996), originally conceived as a cyber-novel, can be clicked through so quickly today that the moment of surprise in the tension of waiting for the next action vanishes. For the former journalist, the time factor here becomes a stylistic element that is now successively changing. The extent to which Olia Lialina is aware of the inexorable changing of the Internet and with it one's own adaptations, is evident in that she makes different versions of this work available on the Internet.[34] In 2008 she also had her **Agatha Appears** (1997) restored.[35] The increase in speed becomes almost measurable with the cult porno **Deep Throat** (1972), which the ASCII-Art-Ensemble[36] placed on the Internet in 1996 as an ASCII film. The feature film that lasted ninety minutes when it was made, now takes barely half an hour.[37]

3.2.2. Moving to a New Domain

Not least of all, something that is often neglected is the relocation of a net art work to a different domain. Artist groups like Etoy[38] and Jodi[39] already impressively demonstrated in the late 1990s that the (original) URL is often directly part of the work.[40] Artists are frequently not fully aware of the value of a certain domain and then later have to laboriously buy back their own domains. Whereas the problem is relatively easy to solve in the collection context and for exhibitions,[41] this aspect presents a serious problem especially for artistic works that are privately owned and visited primarily via the Internet.

4. MAINTENANCE AND RE-CREATING PLAYABILITY

Despite all the problems, danger zones and aging processes, however, positive developments must not be overlooked. More recently, old net art works or artistic websites that have been offline or at least not directly accessible have been sporadically showing up again. One example is the launch of the Austrian node of **The Thing**[42] by the Ludwig Boltzmann Institute Media.Art.Research in 2007/08.[43] Another example could be the (re-) provision of the World Artistic Property Organization website (WAPO) by the Center for Art and Media (ZKM) Karlsruhe in Summer 2008.[44] These kinds of reanimation actions benefit especially artistic websites that are anchored in an institutionally supported work combination. Some artists, who have developed net works

33 http://www.teleportacia.org/war [03.2010].
34 http://myboyfriendcameback-fromth.ewar.ru [03.2010].
35 http://www.incca.org/preservation/390-wysocka-e-agatha-re-appears-net-art-resoration-project.html [03.2010].
35 During a festival in Amsterdam in 1998, the artists and programmers Walter van der Cruijsen, Luka Frelih and Vuk Cosic formed the **ASCII-Art-Ensemble**. The group is one of the most well known pioneers of net art. Cf. http://www.ljudmila.org/~vuk/ascii/aae.html [03.2010].
37 http://www1.zkm.de/~wvdc/ascii/java [03.2010].
38 The group etoy/etoy.CORPORATION has existed in various formations since 1994. The founding members included Gino Esposto, Michel Zai, Daniel Udatny, Martin Kubli, Marky Goldstein (etoy.GOLDSTEIN), Fabio Gramazio (etoy.GRAMAZIO) and Hans Bernhard (cf. http://www.etoy.com [03.2010])
39 Joan Heemskerk, Dirk Paesmans, http://www.jodi.org [03.2010].
40 eToys Inc. vs. etoy. First hearing in the case eToys Inc. vs. etoy, in: etoy.HISTORY-FILE: 08-10-99, URL: http://history.etoy.com/stories/entries/38 [03.2010].
41 For this reason, AktiveArchive has purposely integrated a separate nameserver functionality in its conservation, archiving and display tool Netart Router.
42 http://www.thing.at [12.2008].
43 http://media.lbg.ac.at/de/content.php?iMenuID=94&iContentID=91 [03.2010].
44 http://salon-digital.zkm.de/~wapo/intro.htm [03.2010]. It is to be hoped that the entire «Salon Digital» (1996/97, Walter van der Cruijsen, Christian Gosch, Jürgen Enge) will be reestablished at some point. It is considered one of the first museum online catalogues, at least in the German-speaking region, and provided access to some of the works in the ZKM media museum in an interactive labyrinth.

in conjunction with collective projects, no longer have access to the original programming themselves. Sometimes the works were realized directly on the computers of the institution. The probability that old backups can be found in large media art facilities is statistically higher than with self-administered web servers, where the routine backup is left up to the artists (groups).

In addition to the institutionally launched re-establishment of net art works, a growing awareness for issues of maintaining the digital cultural heritage can also be noted. Today there are archiving concepts for simple web contents as a matter of course, as well as guidelines for how dealing with net art works can be expanded.[45] This trend has a noticeable effect on artists, as outlined above with the example of Olia Lialina.[46]

At the intersection between institution and self-initiative, Reinhard Storz' action to save the collective project **The Ram Show**[47] (1999) should also be mentioned. The curator and net activist had already completely updated the programming of the elaborate net art work on the theme of remembering and memory in 2004, after interactive navigation had become impossible due to modified browser functions. Here the formerly HTML-based programming was replicated in Flash, so that the old look and feel and the original appearance were made accessible again.

From an art historical perspective, as the example of John Klima suggests, alternative artistic preservation strategies also remain interesting, because they convey insights into the intention and the aesthetic basic principles. At least three strategies can thus be distinguished: the first group of artists attempts to keep their work alive through regular monitoring, specific updates and sometimes elaborate re-creation scenarios. Here they also use the opportunity of a system update to aesthetically update their works. These measures, which satisfy artistic demands, partly find only mitigated understanding among restorers and art historians, because they level the historical development of the genesis of the work to some extent. It is not unusual for the new work versions to be simply continued under the same, often already successful title. Another group of artists regards the technically induced degradation of their works as the natural course of things and stands by the partial decay. They leave the work torsos online, thus placing their works in a tradition of the approximative self-dissolution of art works, as this is and has been prominently practiced by Dieter Roth or Damien Hirst, for example. Yet others fear a negative image due to the superficial remains of worn out net art works and prefer to remove the websites in question from the net right away. In extreme cases, all that remains then are screenshots or sporadic relics in an Internet archive like the «Waybackmachine», which supports visual memory with automatically crawled, often fragmentary and static data.[48]

45 Whereas the Swiss National Library developed strategies for archiving electronic Helvetica within the framework of **eHelvetica** (http://www.nb.admin.ch/slb/slb_professionnel/01693/index.html?lang=de [03.2010]), the Swiss Federal Archive (BAR) deals with digital archiving in the project ARELDA (http://www.bar.admin.ch/themen/00772/index.html?lang=de [03.2010]). Proposals for the digital long-term archiving of web-based data can be found in: **nestor Handbuch. Eine kleine Enzyklopädie der digitalen Langzeitarchivierung**, Version 2.0, Boizenburg: vwh, 2009.

46 http://www.c3.hu/collection/agatha [03.2010].

47 http://www.xcult.org/ateliers/ramshow/index.HTML [03.2010]. The work was realized in cooperation with Monica Studer and Christoph van den Berg and other artists.

4.1. CONCLUDING REMARKS

The observations presented here are based primarily on an art-technical motivation and show aspects of classical cases of damage to net art works and their causes. These influence handling, exhibition and preservation to a certain extent. Yet the core question that remains is to consider how much originality a technically obsolete environment can take in current daily operations and how the changed understanding of originality, authenticity and work affects the sustainable conservation of net art. This question can hardly be answered by one discipline alone. On the one hand, detailed information sciences knowledge and expertise in media technology are needed to understand the phenomena of damage, correctly register them and be able to develop possible measures for stabilization or res-toration. On the other hand, forms of observation from art studies support a fundamental understanding of the artistic concept, the aesthetic orientation and the historical contextualization: the art work **documents** certain artistic strategies, of which the intention and the form of articulation should be preserved as intact as possible. Finally, there is the question of the work at the material level from the perspective of current theories of conservation and restoration. The former position of physically safeguarding features[50] is taken over by the preservation of media objects as authentically as possible, including the way they are functionally networked in a system environment. Respected international research projects also suggest artist interviews as planning instruments for preventative conservation.[51] In other areas of contemporary art, interviewing artists has long since progressed to a strategic methodological instrument;[52] it mediates between documentation and the planned conservation measures.[53]

The diversity of methods ensured in this way allows for a re-evaluation of defects at the level of digital coding. Depending on informatic findings, scaled transitions may be connected with epochal threshold situations without necessarily linking the digital code with cultural codes. The intention is a culture-historical, media-archaeological sensitization for technological fractures, in order to assess mid-term and long-term consequences for the conservation of net art and digital artifacts. Research is also being conducted on the practical implementation of **sustainability** in a field of inexorable (digital) changes. In addition to the question of the understanding of authenticity, it

48 http://www.archive.org/web/web.php [03.2010].

49 On this, cf. e.g. Pip Laurenson, «Authenticity, Change and Loss in the Conservation of Time-Based Media Installations», in: http://www.tate.org.uk/research/tateresearch/tatepapers/06autumn/laurenson.htm [03.2010].
Howard Besser and Mona Jimenez even propagate the term «complex media» to cover the issues across genres.

50 Ulrich Schiessl, «Materielle Befundsicherung an Skulptur und Malerei», in: Hans Belting et al. (Ed.), **Kunstgeschichte. Eine Einführung**, Berlin: Dietrich Reimer, 1985, p. 58f.

51 Richard Rinehart (2002), Preserving the Rhizome ArtBase, New York: http://rhizome.org/artbase/report.htm [03.2010].
Relevant proposals are also found in the Tate Modern, which are even accessible online.

52 As far as the art studies position of the artist interview is concerned, cf. e.g. Christoph Lichtin, **Das Künstlerinterview: Analyse eines Kunstprodukts**, Bern: Lang, 2004.

53 Cf. Erich Gantzert-Castrillo, **Archiv für Techniken und Arbeitsmaterialien zeitgenössischer Künstler**, Wiesbaden, 1968 / 79, and various EU and research projects, such as the International Network for the Conservation of Contemporary Art INCA (http://www.incca.nl [03.2010]) or **Inside Installation** (http://www.inside-installations.org [03.2010]).

54 Inke Arns, «Unformatierter ASCII-Text sieht ziemlich gut aus – Die Geburt der Netzkunst aus dem Geiste des Unfalls», in: Thomas Wulffen (Ed.), **Der gerissene Faden. Nichtlineare Techniken der Kunst**. Kunstforum International, Vol. 155, June / July 2001, p. 236 – 241.

55 Reinhard Storz, «Cargo Cult im Cyberspace, Jodi – Laborieren am Quellcode», 2002, in: http://www.xcult.ch/texte/rest/jodi.html [03.2010].

must also be clarified, for example, how historically informed performance practices will look in the future, or how adaptable and sometimes timeless net art works actually are. In taking recourse to current data sources, many works seem to permanently renew themselves. However, historical parameters also inscribe themselves here, which attribute the works to a certain time, a certain mental attitude and, indeed, also certain technological standards. In addition, as Inke Arns already explained earlier, various net art works also play with «what is normally suppressed as a technical dysfunction». The author goes on to explain that media disruptions in the communication between machines have always been made visible by net art works that radically deconstruct and aesthetically reshape them.[54] Looking at works like **Oss** (1999), Reinhard Storz has similarly noted that the artist group Jodi tracks down productive defective functions in the seemingly rigid command language of commercial software and achieves effects «that others sometimes misunderstand as defects».[55] Ambivalent tendencies such as the moment of up-to-dateness becoming obsolete or fragile stability thus imbue net art at the demarcation line of media breaks with a very special charm.

Translated from German by Aileen Derieg

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