

New Media Art in the Museum Environment

A Problem-Oriented Study of the Exhibition of
Interactive, Digital, and Immaterial Objects in the
Art Museum.

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1 Introduction

The invention of computer technologies and later of the World Wide Web changed every aspect of human life from social interactions, economic transactions to the political decision making process. New information technologies changed even our very perception of time, space and memory. This profound development did not leave the arts untouched. From the very beginning, artists were interested in new media technologies and experimented with the new aesthetic possibilities.

The origin of new media art, or digital media art is often associated with the internet boom of the 1990s, even though the movement can be traced back to the 1950s, when artists like Vera Molnar and Georg Nees first experiments with program generated paintings. These first artists often used computer generated code in order to create works resembling, abstract, geometrical painting and sculpture and but experimented also with the inherent interactive characteristics of new media technologies.

The first exhibitions of computer created art also date back to the 1960s. The Howard Wise Gallery in New York showed *Computer Generated Pictures*, in 1965, Max Bense created the University Art Gallery in Stuttgart exhibiting mainly computer art and the artist group Experiments in Art and Technology (E.A.T.), founded by Robert Rauschenberg and the electrical engineer Billy Klüver, held their famous *9 Evenings* in Armory Hall in New York in 1966.

Even though the first commercially distributed computer was build in 1965,¹ it took until 1976 when Apple created the first user friendly computer, the Apple I, which could also be used by non specialists.² The development of virtual reality technologies in the 80s, like the Head-Sight-Television-System launched by the corporation in 1985, and finally the rise of the internet in the 90s, as well as the mass commercialization of small and relatively cheap personal digital assistants and locative media created new means for artistic expression.

Today, new media art can include a wide range of technologies and means of expression, collages assembled and manipulated on the computer, 3D animation, web sites, programs, virtual reality, multimedia sculpture and program controlled environments being only some of them. Artists make free use of the possibilities offered by the numeric machine, critically questioning the conditions opposed on human life through the ongoing digitization and programming.

The integration of new media art into the art museum however was not without complications and many new media curators and theorists still criticize the museums' neglect in this field (Cook & Graham, 2010; Lieser, 2009; Morris, 2001; Weibel, 2010, p. 8). New media art would have characteristics different from other media and uncommon in the art museum and furthermore criticize and question the museums' traditional function. This paper, in examination of museum theory and practice and close observation of new media art, asks the question, what is it about new media art that makes it difficult for museums to deal with it, and why should the art museum as cultural institution make an effort to integrate it anyway?

1 The company Digital Equipment Corporation created the minicomputer PDP -8. Myron Krueger used the PDP-11 and PDP-12 for his interactive environments.

2 David Rokeby used the 1977 Apple II for his interactive sound environments.

1.1 What is New Media Art – an Attempt for a Disambiguation

The term new media art is generally used in order to describe a variety of practices using new and emerging media technologies. It is not a uniform movement, it has no manifest, but evolves around the activities of individual artists, artist groups and activists. It is an umbrella term that include fields like “art & technology, art/sci, computer art, electric art, digital art, intermedia, multimedia, tactile media, emerging media, upstart media, variable media, locative media, immersive art, interactive art, and Things That You Plug In” (Cook & Graham, 2010, p. 4).

The term itself is not without ambiguity. Each part of it can be contested on its own behalf. What is new? Something that is new today will be old tomorrow. What is a medium? Oil painting is also a medium that has been new one day. And what is art? The theories around this questions are numerous and not the subject of this paper. This is not the attempt to find an overall valid definition of new media art, but rather a clarification of what kind of artworks the reader can expect to find in this paper.

Even though the term 'new media art' has been and still sometimes is used in order to describe time-based media like video and film, they are now more often excluded from the field, although they share important characteristics with new media, like being time-based, that they can be copied and edited, or the fact, that the support, the screening technology and the actual image can be separated. However, art described as new media art has also other characteristics that can not be found in video or film.

There is a number of terms that are often used to describe new media art, like interactive, process-based, connected, variable, performative, distributed, computable, collaborative, and so on. Those characteristics can be combined freely. There is no conclusive list of characteristics for new media art, nor does it necessarily combine all these characteristics. The boundaries of what is generally understood as new media art are blurred and there is no overall conclusive definition.

Lev Manovich identifies the use of digital technologies in the production, distribution and exhibition as condition for an object to be a new media object (Manovich, 2001, p. 19). This definition would include almost every object produced by contemporary culture: a book, or an article written on the computer, or a house or a car planned with the help of software applications, disregarding whether or not this use of new media technologies is not necessarily visible in the end product.

Christine Paul specifies by describing two distinct kinds of use of digital technologies for the creation of art. First, the computer can be used rather as tool for the creation, distribution or storage of more traditional art. The second approach uses digital technologies as medium, thus making use of the inherent interactive and participatory features of new media technologies (Paul, 2008a, pp. 7–8). This group contains practices like net art, virtual reality, software art, interactive media environment and computer games.

The first group mainly shows characteristics which can be found generally in 'traditional' art forms and therefor will not be discussed as new media art in this paper. The second group however, challenges the museum as an institution on a deeper level and will be the core of my analysis. However, it is rash to assume that new media art necessarily needs to be digital. Some works can exhibit similar characteristics to computer generated art, but

without using digital technologies.³ Richard Rinehart, a media art specialist and curator, counts the oeuvre of Felix Gonzales-Torres to new media art (Rinehart & Ippolito, 2014, p. 26), because it is process-, and time-based, performative, interactive, and distributed, etc. and also challenges the conception of the museum. However, this paper will focus on art that integrates the computer and digital code as inherent part of their creation and presentation strategies, that is interactive and performative and inherently variable.

1.2 The content of this paper

Authors writing about new media art in the museum environment often criticize the lack of interest of art museums in new media art using the interactive strategies inherent to new media technologies. This paper will discuss the difficulties and opportunities encountered in the exhibition of new media art. What is it about new media art that makes it difficult for the museum to deal with, or is the problem rather connected to the static cling to established methods and functions in the art museum? How can the museum adapt its methods in order to resolve this problems and which advantages does the museum have from dealing with new media art?

Because of its rising significance on the one hand and its ephemeral character on the other it is important that museums deal with new media art and include it more significantly in their collections. This theses should not be understood as a guide book for a successful exhibition of new media art but rather as a theoretical reflection replenished with a collection of experiences made by new media curators in the past. It will identify conflicts, propose solutions, and advocate for the importance of a serious engagement of museums for interactive media art, still too often marginalized by the institutional art world.

The first chapter will focus on the inherent characteristics of new media art. Even though new media art does not exhibit a unified set of aesthetic properties, is constantly evolving, and does not necessarily share all the same features, some frequent characteristics, intriguing for the art museum, can be identified. Even though, as will be shown in this chapters, the characteristics of new media art also occurs in other art practices, namely in happening and performance and in other ephemeral or time-based media, they are still especially difficult to deal with for the art museum.

The second chapter will focus on the traditional functions of the museum, collecting, presentation, documentation, preservation and mediation. All of these functions are challenged by new media art in their own account. New media art questions the most fundamental assumptions of these institutions concerning ownership, preservation, and production of content as well as the understanding of what is an artwork as such. These challenges will be discussed and solutions will be presented based on experiences made in media art exhibitions.

Finally, the third and last chapter will put an emphasis on the advantages new media art can bring to the museum. The chapter will investigate the possibilities of new media to attract a new, more inclusive audience, the means to include the audience into the curatorial decision making process, to provide a new context for modern and contemporary art, thus enlarging

3 The videodisk would be one of the devices used by artists exhibiting largely similar characteristics to digital media. Artists like Lynn Herschman and Grahame Weinbern used the Videodisc in order to create interactive, user-steered storytelling.

the approaches for its analysis and understanding, and finally the opportunity to eventually create access to different sources for funding.

2 Characteristics of New Media Art Uncommon in the Museum Environment

Still today, even though computerized interactions are part of our everyday communications and digital images are ubiquitous in visual culture, interactive media art has a difficult stand in the institutional art world. Initiatives and exhibition projects are rather bound to single curators, like Benjamin Weil, Steve Dietz, Christiane Paul or Beryl Graham than to art museums. The position of interactive media art is still controversial in the institutional art world and their place in the art museum still is not self evident. In London, for example the museum with the biggest amount of media art on show is the science museum, whereas Tate Modern, even though they created an online platform for net art, still has no work of interactive media art in their permanent exhibition (Cook & Graham, 2010, p. 190). The reluctance museums showed towards new media art, especially in the early stages, indicates that it has a unique set of characteristics, which might be challenging for art museums, some features, which are uncommon or difficult to handle in the museum environment.

However, the newness of new media art seems to be a constant discussion point, dividing the authors into mainly two groups – those who claim everything is new about new media and those who are convinced that new media does not bring new characteristics to the art practice. Indeed, it seems like for everything special about new media art a counterexample is readily available, proving that its special characteristics have already been brought to issue before.

Many of the characteristics of new media art, like process-orientated, time-based, immateriality, use of technology, or interactivity, modularity, variability, and customizability cannot be said to be exclusive for new media art. Indeed, many of them are encountered repeatedly in the art practice since the 60s. In the following, each of the characteristics most commonly discussed in connection with new media art will be analyzed in terms of their evolution in the art practice and the special condition it creates in terms of the exhibition of new media art in the museum.

The characteristics discussed in the following are by no means a complete list. They can be understood more like a flexible construct of terms often encountered in the discussion of new media art. Beryl Graham from the CRUMB network has elaborated a more comprehensive list of taxonomies commonly used in the new media community.⁴ Furthermore, many of the characteristics of new media art are related to each other. For example, the characteristics 'processed' and 'time based' contribute to new media art being 'immaterial'. To avoid repetition and because of this work's length, not every characteristic will be discussed in length but only the ones which seem to be the most significant for the sake of this theses.

2.1 Does New Media Art Need the Art Museums?

Before looking at the spacial characteristics new media art brings to the institutional art

4 The list is available at the CRUMB network (Graham & Cook, n.d.).

world it is important to ask whether or not this special art form, mainly developed outside the institutional world, does benefit from its presentation in the art museum.

Even though there have been some prominent exhibitions of new media art in the 60s, 70s, and 80s, most art world institutions regarded the new medium with suspicion or ignorance at least until the late 90s.⁵ From the year 2000 onwards the main venue for the exhibition of new media art is not the museum, but the art festival (Cook, 2013, p. 393). New media artists who often criticized the museum as institution, as many other artists did before, found their own platforms and events for the distribution of their art. A number of annual festivals and conferences as well as online platforms, blogs and e-mail lists became very popular among the media art community. These platforms overtook typical museum functions, like exhibition, discussion and mediation of cultural objects and replaced the museum in this regard.

Because the media art community developed independent platforms for their art, the museum is challenged in its traditional position as main distributor for art. One could argue that new media art, especially net art, which is conceived for and distributed on the global WWW, does not need the museum as space for exhibition and that it should prevail in its natural environment, the internet. Much new media art developed independently from the traditional gatekeepers and does not rely on them as legitimizing instance. So why should new media artists want their works to be represented in museums and gallery halls? Do the traditional institutions have features that the alternative platforms cannot, or do not yet presume?

With the independence from traditional gatekeepers comes a certain liberty and freedom. However, traditional art world institutions provide a financial and personal infrastructure that most other platforms, such as festivals, do not have. "This may sound obvious to some," Rosanne Altstatt, director at the Edith Russ Site for new media states, "but most of the traditional outlets for media art such as festivals do not have this infrastructure on a year round basis, although one spends at least a year planning each festival" (Altstatt, 2004). This infrastructure may concern bookkeepers, janitors, and people who take care of the building. Although festivals offer a great possibility to present and test contemporary art, they are punctual events with a limited structure of access and cannot assure the presentation and equally importantly, the preservation of art on a permanent, long lasting basis. Sarah Cook further describes a general fatigue concerning festivals and biennials, which would not do the art exhibited justice (Cook, 2013, p. 392). They are often too short and too large in order to allow for a profound relation to the art and to give the works the attention they need. The art world institutions have a selective function, thus structuring the art practice for the beholder (e.g. Couchot & Hillaire, 2003, p. 76). Museums work as information filters, not only canalizing the public's attention, but also structuring the common memory. Such authority is not only selecting the art which should be preserved for the future, but also facilitating the physical and cognitive access to the art for what is called the public at large.

Since not everybody is an art connoisseur, the general public often relies on institutions to make a significant selection. Speaking in terms of the Shannon-Weaver information theory, the museum augments the likeliness of information, the work of art in this case, to reach its

5 The *Documenta X* (1997) changed the way new media art was regarded in the art world, even though the exhibition was largely criticized by the new media art community for its static, offline, and office-based presentation (Cook, 2008, p. 29).

receiver, the public at large, and furthermore supports the receiver decoding the message by proposing a basis for the interpretation of the artwork. The viewer is not left on its own, but supported by the museum, which helps understanding the message. Web sites, such as *Media Art Net* or *Rhizome.org*, which could indeed be understood as online museums made an effort to overtake traditional museum functions, namely to select, categorize, interpret, and sometimes to preserve art created for the distribution on the internet. Although new media platforms provide a place of the presentation and discussion of art, they are mostly visited by the new media art community. The art museum has a reach, these alternative platforms cannot, or at least not yet, compete with. Thus, being part of museum exhibitions would allow new media art to connect to a larger public.

On the internet, the selecting and hierarchic function of the museum is taken over by search engines. The likeliness of the message to reach the receiver is influenced by the algorithms of the machine. Theoretically, everything that is published on the internet can be viewed by the public, but in order to be accessed, a content has to be found first. Algorithms on which the search engines are based will decide whether a certain web page will appear at the top, middle or bottom of the list of results for a search request. The hierarchical ordering of the search engine will thus determine the likeliness of a web page to be seen by the public.⁶

While new media art platforms contribute to the distribution of this kind of art, the fact that they are outside the traditional art world prohibits new media art from becoming part of the official art canon. According to Arthur Danto's art world theory and George Dickie's institutional definition of art, works can only be recognized as art, when they are part of the art world: "To see something as art requires something the eye cannot descry—an atmosphere of artistic theory, a knowledge of the history of art: an art world" (Danto, 1964; see also Dickie, 1971). According to this theory, something becomes art, when it is regarded as art by the art world. In spite of its theoretical shortcomings, the circularity of defining the art world in terms of art and art in terms of the art world, the theory has practical value. In order for new media art to be officially recognized as art it has to be part of the art world, and the museum as the major agency in this world. The alternative platforms developed since the 80s have such authority only in the media art community, but not in the over all art world.

Sarah Cook described this difficulty of new media art to be recognized as art as the greatest challenge of the media art community:

The greatest challenge for these artists groups – unless they align themselves with art production and exhibition facilities (...) – lies in making art of their socially and politically engaged, activist projects and community oriented tools. According to traditional notions of art's object-hood, these projects and their resulting shared intellectual property do not necessarily qualify as art because they cannot be commodified or distributed in the ways usual for art. (Cook, 2008, p. 31)

Whether new media art wants to be part of the official, art historical canon is a separate question that is worth closer examination.

The representation in the art museum has some unbeatable advantages over independent

6 In a sample search on Google with key words like "new media art", "new media art collection", "new media art online" and others, online platforms for new media art, which are emphasized by the literature as most influential, did not appear at the top of the search results, whereby *Rhizome* generally still was noted on the first page, others like *CRUMB* or *media art net* were more difficult to find. Many of the results were in fact commercial web sites. This results of this sample search throws the criteria applied by search engines into question.



Figure 1: Jeffrey Shaw, Dirk Groenewald, Gideon May, Lothar Schmitt & Huib Nelissen, *The Legible City* (1988-1991), interactive installation, projector, modified bicycle, LCD-flatscreen, SGI Maximum Impact, personal computer, real-time graphic system, self developed software. Installation view, ZKM, Karlsruhe.

platforms: Among others, museums have larger budgets for the acquisition and preservation of art and they are able to sponsor artists. Their authority is recognized and a large public visits them regularly. Finally, they have large publicity budgets which allow them to advertise for their exhibitions.

Some forms of new media art, namely net art, can be created by any artist with a computer without having to resort to a large amount of material, and thus financial, investment. Others, like for example Jeffrey Shaw's interactive environments depend on sometimes expensive materials. The three versions of *The Legible City* (1988-1991, fig.1) could not have been created without commissioning. Shaw even refers to the hometowns of the commissioners of the three versions of *The Legible City* with the choice of the three cities represented, Manhattan, Amsterdam, and Karlsruhe. Without institutional funding, many of Shaw's works to cite only one example could not have been created (Dinkla, 1997, p. 114). Even though there are prizes and stipends created especially for new media art, the belonging to the official art canon can deblock the access to further funding and thus contribute to the flourishing of the genre.

While Sarah Cook thought mainly about the funding of media art projects in her priority quoted statement, another traditional museum function is significant for new media art: the preservation. New media art is especially ephemeral and difficult to preserve as will be discussed in the following (chapter 3.4 *Preservation*). One of the museums' main function is the preservation of art for future generations. In order to have a better chance to be preserved, it is important for a given work of art to be part of a collection, private or public, which takes care of the work and which has the necessary funds to preserve it. As discussed before, many

of the alternative platforms for new media art are themselves ephemeral⁷ and have neither the financial resources, nor the infrastructure to efficiently preserve art. Furthermore, while many of the alternative platforms are interfaces to present media art, they do not necessarily acquire it. Therefore their mandate is to present, mediate and discuss, but not to preserve.⁸

In spite of the institutional critique brought towards art museums, they are not easily replaceable. Even though alternative platforms have some advantages, first of all a more democratic approach to art, museums still have the possibility to reach a larger public on a year around basis. The stability of their funding makes it unlikely that they will disappear anytime soon and they are, at least at the moment, the most important agency charged with the preservation of cultural and artistic value. For an artwork to be part of a museum collection does not only mean that it will reach many people in the present, but it also increases its chance to withstand the ravages of time and be available to a future public.

2.2 Use of New Technologies

While the 21st century avant-garde turned against elaborated techniques and advocated that everything can become art, new media brought back the necessity of a technical know how, which has often been subject to misunderstanding and ignorance. Until the creation of easily usable and affordable personal computers and image processing programs, artists had to either be familiar with programming languages or cooperate with scientists or professional programmers in order to create art on the computer. The digital reintroduces a certain technicality into art, thus opposing the dominant current in art (Couchot & Hillaire, 2003, pp. 114–115).

The source of the difficulties related to new technology is often too hasty made out to be solely the digitality of new media. Even though most of the new media artworks discussed in this paper are also digital, a work might fall under the category of new media without being digital. Also, many artworks have a digital component, even though they would not generally be described as new media art.⁹ On the other hand, works may share characteristics of new media, be interactive, process-based and even immaterial, but without being digital.¹⁰ Peter Weibel even argues that the history of interactive and virtual art beings before the introduction of the computer as digital calculation machine. He points out in his article *It Is Forbidden Not*

7 E.g. festivals which take place only at a specific point of time and present art, but rarely acquire it. Online platforms are ephemeral because of the pace with which a given software becomes obsolete therefor needing constant updating, which might be difficult to provide without long-lasting funding.

8 One might be somewhat inclined to argue that it is not necessarily the artist's intent for his art objects to be preserved. The momentariness can be an internal factor in the conception of an art object. Hence, preservation can be contradictory to the artist's intention and the concept of the artwork. Does this mean that ephemeral works should not be preserved? When momentariness is a factor of artistic production, agencies charged with the preservation of cultural values, first of all museums, should find a way to preserve this very ephemeral characters. Methods and approaches will be discussed in chapter 3.4 *Preservation*.

9 Much of photography and video is edited, stored, or distributed digitally but does not have common characteristics of new media art such as interactivity or immateriality.

10 The work *zgodlocator* (1998-2002) by the German artist Herwig Weiser in collaboration with the engineer Albert Bleckmann and the musician F.X.Randomiz could be mentioned as an example for such artworks. *Zgodlocator* is a reactive field that can be manipulated by the spectator even though it is completely analog Weiser used the computer not to run software, but he extracted the different metals, silver, gold, platinum and ferrite and heavy oil which is a part of every computer in order to create *Zgodlocator*. These materials were finely ground and placed above a set of batteries. The visitors could control the power of the batteries via a control unit and observe the so induced changes in the structure of the materials. The movement of the mass also produces sound, which is captured by sensors can be amplified by the intervention of the visitors (Zielinski, 2010, p. for more information see)

to Touch: Some Remarks on the (Forgotten Parts of the) History of Interactivity and Virtuality that kinetic and optical art already had characteristics which would be used later to describe new media art, namely virtuality, the environment, the active spectator and/or user. Everything that would later characterize computer art and the interactive virtual environment would already be there, although in purely analog or mechanical form (Weibel, 2010, p. 38).” Indeed, the activation of the work through pushing buttons or keys and optical change induced by movement are already inherent to precomputer forms of mechanical art.

It is not just the digital code, not just the software, but the entire technical set up, including the hardware that is challenging to the traditional museum world. Two main problems can be identified which are directly connected to the technical component of new media art. First, museum staff often does not have the technical know how to understand and evaluate the functioning of the work, which may be inherent to its apprehension. Therefore new media art might be misjudged and not selected for an exhibition. And secondly, a whole technical apparatus might be necessary for the exhibition of new media art, equipment the museum does not necessarily have nor know how to obtain and maintain it. The set up and maintenance of the technical equipment comes with a proper set of difficulties the museum staff is not necessarily prepared for. Both aspects of the problem will be discussed in the following.

2.2.1 Misunderstanding of New Media Technologies

The technological component of new media art is a common factor for its misunderstanding. For quite some time it was only regarded as byproduct of a more traditional art production: In the case of Vera Molnar and Manfred Mohr the computer generated plotter drawings were not perceived as the art since they were often used in order to create works on canvas or embossed steel. This changed only recently since institutions such as Kunsthalle in Bremen systematically paid attention to the first digital drawings (Lieser, 2009, pp. 59–63).

The analysis of new media artworks then often puts an emphasis on subjective sense perception, short-circuiting the technical and digital aspects of the work because of a lack of understanding, even though it is this technique which is at the heart of the artwork. Geoff Cox argues in his essay *The aesthetics of generative code* for the importance to of the comprehension of the digital code for the understanding of new media art. Like poetry, which cannot be reduced to visible or audible signs, but is composed of language itself, generative code has its own aesthetic values, lying in the relation between the code and its actions. “To separate the code and the resultant actions would simply limit the aesthetic experience, and ultimately the study of these forms - as a form of criticism (what might be better called ‘poetics’).” (Cox, McLean, & Ward, 2000)

It has often been argued, new media art, because of its technological component would be better suited for a science museum. However, new media art is also controversial in the scientific community. For computer specialists, the visual imaginary presented in new media art is foreign and challenges the often only rudimentary knowledge of art and cultural history.

The mutually contrasting means of expression, innovative technology external to art, and historical, art quotations, inaccessible to the science community, made new media art an outsider in both communities. For new media artworks both levels, the innovative technology and the subject matter are often equally important and it can only be treated appropriately

when at least some understanding of both is existing.

Jeffrey Shaw's *Alice's Room*¹¹ (1989), playing with the characteristics of virtual reality is one of the examples of artworks which had success on a science exhibition but only found recognition in the art world after some profound changes to the interface and the subject matter had been made. Shaw generated spaces, in which physical and material laws are overridden, where objects could split and reassemble themselves, rotate without coherent driving force or float in the space in analogy to Lewis Carroll's novel *Through the Looking Glass*. Shaw understands the computer generated space not as copy or simulation of physical space, not as image of reality, but as a magical space which is subject to its own laws and regulations.

However, the joystick interface and the virtual reality subject may have reminded too much on the aesthetics of amusement halls (Dinkla, 1997, p. 126) and the work could only enter the art world after some significant changes. The VR analogy was replaced by a museum critique and the joystick interface gave place to a more sensual control system. Thus *Alice's Room* became *The Virtual Museum* (in analogy to André Malraux's *Museum Without Walls*).¹²

In opposition to *Alice's Room*, *The Virtual Museum* has been exhibited several times in different Museums, among others in 1992 at the Centre Georges Pompidou in Paris. The example illustrates the incomprehension that the art world had towards the technological component of new media. Only after Shaw had adapted his work to the commerce of the art world, and added a literal connection to the museum practice, the work found its way into exhibitions in the art context. Nonetheless, *The Virtual Museum* has never been exhibited in an exhibition which did not have a focus on new media art what can be understood as an indicator for the separation of interactive media art from the rest of the arts.

Today, this incomprehension of the technology has changed in so far that, even though in the art world there are very little computer specialists, everybody has at least some knowledge and experience with the most common computer applications. Because of the ubiquity of new media and digital communication devices, almost everyone who is in contact

11 *Alice's Room* is an interactive environment which was first shown at the *Art&Science* Exhibition held at Kanagawa Science Center in Japan. The screen, mounted on a rotatable 2,5 meter large platform, showed an exact simulation of the exhibition room from the viewpoint of the monitor. The beholder could trigger the rotation of the platform with the help of a portable joystick and the viewpoint of the computer-generated room changed accordingly. The physical room and the simulation were optically aligned, allowing a conjunction between physical and virtual space.

In the corners of the virtual room four boxes in red, green, yellow, and blue were visible. When the viewer approaches these boxes their walls dissolve and the viewer finds himself inside a new room, whose visual qualities were similar to the first one yet having unique characteristics. The first room showed a group of four colored boxes constantly in the process of splitting and reassembling themselves. The second room showed a Japanese poem by Shunatro Tanikawa written in haiku alphabet and moving on and shining through the walls. The third room contained a wire frame cube rotating on its own axis. The fourth and last room consisted in a dark space with a constantly turning replication of the monitor, illuminating the room.

12 In *The Virtual Museum* the movement of the visitor, sitting in a chair on a rotating platform in front of a TV monitor, steers his path through a virtual representation of the museum room. However, it is not possible to stop and pause. The VR representation continues moving towards a wall, even if the visitor sits still. By pushing through the wall four other rooms can be entered, three of which contain virtual exhibits using alphabetic and textual forms in reference to the genre painting, sculpture and film. The fourth room however exhibits the particularities of a computer generated environments with the signs A, 2, and Z in primary colors, which are in the same time the light source, floating in the space. With the use of letters and text for the creation of the virtual exhibits, Shaw is criticizing the reception of art, which only seems possible through its verbalization and advocates for a more sensual experience of art.

with new media art objects has at least a rudimentary understanding of digital technologies. The ubiquity of digital technology in everyday life is slowly closing the gap between art and technology. Furthermore, art and technology classes at universities, and the more frequent exhibition of new media in the museum environment lead to a more comprehensive understanding of new media in the art world.

2.2.2 Exhibition Equipment

The technological element of new media art objects does not only challenge the understanding of the artworks, in terms of requiring a special technical knowledge in order to analyze and interpret the works, it also challenges the museum staff in terms of the installation, maintenance and preservation of the objects. The exhibition of new media art requires more specialized knowledge about technology than the exhibition of traditional objects. For new media art, with its multiple and often variable components for each object, the set up of the exhibition reveals itself more complex than simply hammering a nail in the wall. A profound knowledge of the technology is required and the museum staff has to be specially trained in order to fulfill this condition. Furthermore, the materials for new media art are often perceived as ugly. Exhibition institutions then have to construct special structures in order to hide the computers, wires, speaker, and so on in the walls (Paul, 2006).

In the late sixties, the *Art and Technology Movement* could not prevail in spite of the general atmosphere of change in the art world. Söke Dinkla mentions as one of the main reasons for the short duration of this movement the technical complications encountered (Dinkla, 1997, p. 76). Museums and exhibition halls were simply not equipped and poorly prepared for the challenges posed by the technical medium. The famous *Software* exhibition, organized in 1970 by Jack Burnham in the Jewish Museum in New York has also been described by coevals as “technical disaster” (Benthall, 1972, p. 11 see also p.75).

New media art also is more interference-prone than other media. The technical composites and the permanent interaction with the visitors are sources for damage and malfunction of the works. Therefore it is often not enough to install the exhibition correctly but the museum has to be able to repair defective components quickly. Even in specialized institutions like the ZKM in Karlsruhe with technicians and days reserved for maintenance the defectiveness of works is a reoccurring problem. The institution noticed in 1998 in a statistical visitor evaluation that one of their main negative points is linked to defective devices (“Statistische Auswertung der Besucherumfrage im November ’98,” 1998) and Tilman Baumgärtel observed that in the exhibition *Net_Condition* (1999-2000) a great number of works still was not functioning correctly three days after the opening (Baumgärtel, 2000). The malfunctioning of equipment is a common, reoccurring source for frustration of visitors, which can be avoided through careful preparation and the availability of qualified technicians who can repair defective works quickly.

Rolf Gehlhaar's testimony of the exhibition of his *SOUND=SPACE* (fig.2) at the 1985 show *Les Immatériaux* curated by the philosopher Jean-François Lyotard at the Centre Georges Pompidou well reflects the mutual incomprehension of new media artists and exhibition curators (Gehlhaar, n.d.). First of all, there was almost no communication prior to the installation of the work in the exhibition space, which was done by the artist himself. “Everything was done at arms length” the artist recalls. Therefore it is not surprising that there were some problems with the technical preconditions of the work:

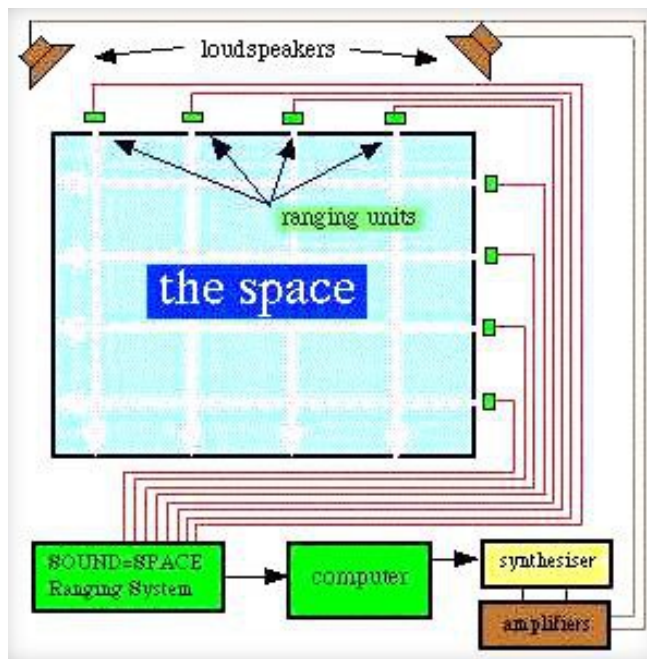


Figure 2: Rolf Gehlhaar, *SOUND=SPACE* (1984), interactive environment, diagramic sketch, dimensions vary with installation.

The problems we encountered on site were numerous, the most important being that the supply of electricity, the amount of light and the ventilation of the space (...) were all insufficient. Whenever we booted the computer and turned on the amplifiers the main fuse would blow, it was painfully dark in the space and it got so hot after only 2-3 hours that the computer would crash. (Gehlhaar, n.d.)

As the situation did not change, even after Gehlhaar had spoken personally to Lyotard, who is described by the artist as “the great man”, like some distant entity, Gehlhaar himself took care of installing more lights and placing two large ventilators in a hole he had cut into the ceiling of the computer cupboard. The energy problem was solved by borrowing electricity from other exhibits until a

proper electricity supply was finally installed after a second visit in Lyotard's office.

The exhibition *Les Immatériaux* also turned out to be extremely expensive. In October 1983 the budget was estimated to 3.945.000 FRF, which corresponds to 1920 FRF per square meter and is comparable to other exhibitions of the same venue, like *L'oreille oubliée* held in 1982-83 with a budget of 1702 FRF/m² and *Eureka 83* (1983) for 1900 FRF/m². However, the budget had to be adjusted several times and was amounted to 6.035.000 in January 1985 with one of the biggest positions being the expenses for constructions and equipment (“Budget estimatif de la manifestation,” 1985, “Manifestation ‘les Immatériaux’ - Galerie 5ème étage- Mars, Avril, Mai 1982, Proposition de Budget,” 1983).

The availability of exhibition equipment can also influence the collection of art for an exhibition. Beryl Graham, professor for new media art at the University of Sunderland and curator, states that the possibility to obtain funding for equipment played a role for the selection of the works for the 1996/7 *Serious Games* exhibition, which he organized as freelance curator. “The key factors affecting selection were the feasibility of having the budget available to provide the equipment” (Graham, 1997, p. 95). The availability of equipment limits the possibility to exhibit new media art. Practical concerns of feasibility thus effect the logically informed selection of works. The inexperience of art institutions in the handling of new media and the unavailability of the proper equipment practically restricts the curator's liberty of choice in the creation of an exhibition.

Rosanne Altstatt noticed in 2004 “virtually unlimited access to Internet lines and stable electricity are two things that few institutions have, but are absolutely necessary for the presentation of media art” (Altstatt, 2004). Science museums often are better equipped for the exhibition of new media and technologically driven art. Therefore it has sometimes been argued that new media belongs in the science and not in the art museum. While the technical component of new media might be well fit for a science museum, the artistic and art historical

component risks being misunderstood. Furthermore, the lack of being represented in an art museum might challenge the art status of new media art.

Whereas at the rise of new media art, the necessary equipment was still expensive and unavailable, digital technology such as personal computers and software are now low in price and more importantly, mobile. Most artists and institutions can effort the indispensable technique for the production and presentation of media art. Furthermore, it is not always necessary to buy the equipment. In case of temporal limited exhibitions renting might be a better opportunity. Regarding the pace of technological development, renting can be good alternative if one wants to keep up with recent technical standards without investing in a new hardware and software every time a new development is available. Furthermore, there are some art institutions specialized in new media offering assistance, know how and equipment for other, less experienced institutions.

2.3 Unlimited Reproducibility

The museums' commitment to uniqueness may represent another point of conflict with new media art. The museums' dedication to singularity however goes further than the often quoted theory of Walter Benjamin according to which a work of art would loose its aura in the process of mechanical reproduction (Walter Benjamin, n.d.). In order to attract visitors and to be internationally relevant, museums strive for unique exhibitions with unique objects, something that can be seen nowhere else in the world. Thus, they enable and control the access to art. As Fisher points out, this wish for uniqueness is amplified by the modern system of mass production:

The museum, in its dedication to uniqueness, to preservation, and to those objects of the past whose useful life is in effect over, came to celebrate just such values, at least in part, because the modern production of objects in the factory system turned out unlimited numbers of identical, replicated objects made to be replaced as soon as they become obsolete. Museums became more and more central in cultures touched most deeply by the modern system of mass-production. [...] No longer do they provide a visible history of culture itself: that is, a display of objects rich with symbolic, local significance. Instead they are storage areas for authenticity and uniqueness per se, for objects from any culture period whatever that were said to be irreplaceable. (Fisher, 2012, p. 453)

New technologies, first photography and video, then digital technology and the internet are not per se unique like paintings or sculpture but have the inherent possibility to be duplicated endlessly without loss of information.¹³ In the 70s and 80s there was the utopian wish for a democratization of art through its duplicability. Video and photography were produced in high editions but the projects failed due to a lack of demand. Although, the concept of unlimited reproduction is well established in other arts, like music or film, it does not prevail in the visual arts.

The notion of unlimited reproduction and immediate accessibility, dominant in the thought about new media objects, is problematic in two ways: first, it does not correspond to museum's strive for unique exhibitions made of unique objects. Secondly, it questions the economic model of art in place. The art marked, in opposition to the music industry, has no model in order to estimate the price of an object, which can be copied endlessly.

13 As Manovich pointed out in his book *The language of New Media* it is actually not true that photography and new media objects can be reproduced infinitely. Indeed, there is more loss of data in the reproduction of media objects than generally thought. The assumption of indefinite reproduction is nonetheless persisted (Manovich, 2001, pp. 56–57).

Generally museums are interested in collecting unique, original artifacts with a high artistic and cultural value. Reproducibility not only challenges the uniqueness of a work of art, but also the idea of the original. Tiziana Caianiello defines the original as following: “Unter Original wir ein in seinem ursprünglichen Material überliefertes Objekt verstanden. An dem originalen Material kann die besondere Geschichte eines Werkes abgelesen werden” (Buschmann & Caianiello, 2013, p. 44). For analog media art, like video or film, the original is often associated with a master of the work, from which all other copies originate. This original master is then locked away in a climate controlled chamber so that there is no possibility for traces of usage that would derogate its value. Thus, the premisses of conservation deny the access to the work which is considered as original. For interactive media, whose code can be duplicated without loss and whose material hardware components can often be replicated or exchanged, the concept of one original work as above mentioned no longer is applicable. Each copy, or each variant, stands rather on equal footing to the others, ready to take on its own life. This is all the more true for works which are self evolving or developing through the interaction with the precipitant. Rather than having one original and several copies, there are can be a multitude of variants which are all equally carrier of the artistic value, which can evolve into different directions, and in the same time propose interactions which are all unique.

The steadily growing indifference between high art and low art, between valuable museum culture and mass production stands in direct contrast to the concept of uniqueness. An increasing number of artists is working with the product industry or released themselves large series of cheap objects, which found their way into museum exhibitions. Examples are easy to be found. Takashi Murakami's production of all kinds of knick-knack modeled after the icons of his famous paintings are an indication for the blurred distinction between art and mass culture. Some of this objects have already been exhibited in Museum exhibition for example at the Murakami retrospective at the Museum of Modern Art in Frankfurt in 2008-09.

The German artist Carsten Nicolai, who is probably best known for his light and sound environments at the intersection between art and technology, which have been exhibited at the Documenta X and Venice Biennial, and his music performances under the alias Alter Novo, successfully published art books in large editions (fig.3; 4). These art books are visual

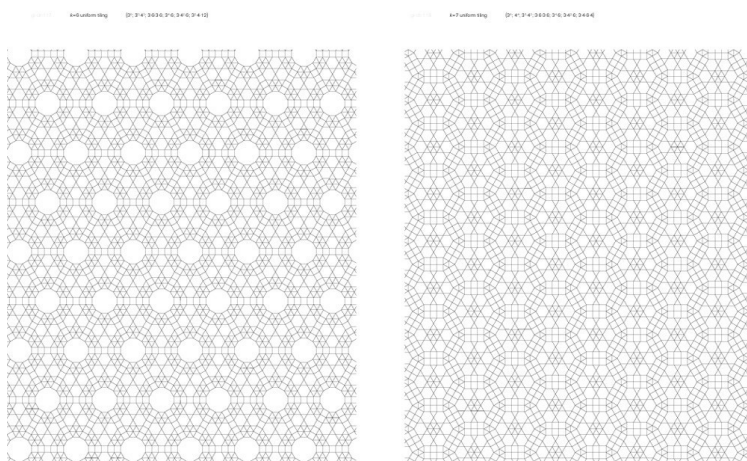


Figure 3: Nicolai, C., *Grid Index* (2009), Berlin: Gestalten.

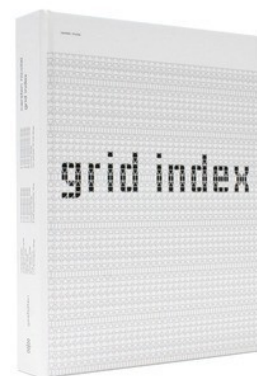


Figure 4: Nicolai, C., *Grid Index* (2009), Berlin: Gestalten.

lexicons containing patterns and grid systems, which are based upon the artist's research on visual codes. Even though Nicolai does not see the grids as independent work of art, but as creative tool, as inspiration for himself and other artists, he thinks that the books might be understood as art (Carsten Nicolai: A little grid more, n.d.). Indeed, the grids remind on minimal, abstract painting. In a certain way, the art books stand in the tradition of the utopian idea of a democratization of art by making it affordable for everyone in large scale productions.

The examples illustrate how artists defy the paradigm of uniqueness and still found their way into the museum space. Nonetheless, museums' drive for uniqueness is not to be underestimated. Museums reveal themselves creative in superposing uniqueness on objects, which inherently are not (Daniels, 2004, p. 97). Through licenses and legal restrictions uniqueness can be created artificially, even though this does not always correspond to the artist's intent.

The approaches taken by museums in order to obtain exclusiveness for their new media art commissions and acquisitions differ from institution to institution, or even from purchase to purchase. Susan Morris' report *Museums & New Media Art* (Morris, 2001), commissioned by the Rockefeller Foundation briefly presents acquisition contracts for net art collections in Anglo-Saxonian museums. Four possibilities for the museum to render uniqueness to media art objects can be identified in the report. The most commonly used method is a one-year exclusive contracts (e.g. San Francisco Museum of Modern Art, Smithsonian American Art Museum, Whitney Museum of American Art, Tate) and two-year licenses (Museum of Modern Art, NY). In these cases the museum has the exclusive rights to display the work of art but the copyrights are kept by the artist. After an agreed upon period of time, here one or two year periods, all rights return to the artist, who generally gains a license fee. The museum is not acquiring the work but only the right to exhibit it for a certain period of time. Thus, this approach can be understood as a loan from the artist to the museum. The weak spot of this method is that the museum has no long term obligations for the work and no responsibility for its preservation. It does not have to ensure the longevity as it does for its collection.

The Walker Art Center in Minneapolis created an online platform for net art, *Gallery 9*, in 1997 and presented the work of more than 100 artists under the direction of Steve Dietz before it was closed again in 2003. The Walker Art Center had non exclusive contracts with the net artists. The artists kept all rights of the works and in exchange for an honorarium (4000 Dollar) the museum obtained the right to exhibit the work. This method can be compared to the purchase of an audio CD, where the copyrights of the work do not change the owner. This approach bears similar problems as the one previously described. The museum has no obligation to preserve the works. Since it does not own the copy rights, it is questionable whether or not the museum even has the right to restore the work, if that would imply changing parts of it.

The most advantageous concept for the artist and the most future-orientates one is the contract that the Guggenheim offered Mark Napier when *Net Flag* was bought in 2002. For the work to be, within reason, unlimited accessible online was part of the stipulation. However, the artist has to ensure the functionality of the work himself. Napier states:

They own it. And I'm giving up rights to it. It's going to reside on their server, but you can

directly link to it from my own site. The whole point being I want it to be Web accessible. I also added into the contract that they are obligated to keep it on the Web all the time. They don't say anything about reselling it, which I assume is not part of that deal. You don't go around just making copies of artworks. They will own the code, although they use the code only to show the artwork. However, I can reuse the code in other projects (as long as I don't recreate this piece again). (in Morris, 2001, p. 24)¹⁴

The contract the Guggenheim made with Mark Napier is the only one of the here described approaches that actually engages the museum into the preservation of the work and thus secures the existence of the work in the future. It also gives the biggest freedom of action to the museum because it is the only case, in which the museum owns the copy rights. Period contracts give museums the possibility to create uniqueness for the works, even though this is restricted to only a limited time span, and give a new platform to the works within the museum, but they do not assure the longevity of the work in the future. The Guggenheim also created uniqueness for the work, but the contract is more adventures for the artist, who is not allowed to copy the work, but to use the source code in order to create other works.

It seems like today, there is no way around copyright laws and intellectual property. Copyrights and certificates have allowed museums to collect new media art and thus have an impact on the visibility and the durability of this variable and highly ephemeral art form. However, those laws should be constructed in a way that they do not prevent future uses of the work as intended by the artist. Copying and remixing is an important part of the creative process of new media works, although a too narrow legal construct prevents these practices and renders creative reuses of the work illegal.¹⁵ Here museums could take an example at the open source programmer community, using licenses that preserve authorship, but also allow the reuse of the code. The code for an open source software, like Linux, is available online and everybody is free to use it and also to modify it as long as the source code of the result can be used openly also. The acquisition contracts used by museum's should state clearly who has the right to use, to re-create, or to re-stage the work and under which circumstances. Museums should not automatically presume uniqueness, but think about what is in the best interest of the work and the artists can use their right to negotiate and think about what they want for their work, whether it is the possibility to reuse it or not.

2.4 Interactivity

The concept of interactivity originates from theory of action and social science and describes the interrelation between actions with the condition of a minimal consensus on communicative techniques and symbols. In the 1960s the term was adopted by computer science in order to describe the reaction of a computer system on the user's input in real-time. Through Human Computer Interfaces (HCI), the user could, for the first time, interact with the machine without time delay instead of waiting for hours and days for the output to be released by the machine. Interactive media is able to create on the fly system responses on

14 On the homepage of the Solomon R. Guggenheim museum *Net Flag* is dated to 2002, although Susan Morris already writes about its acquisition in her report published one year before in 2001.

15 The Law suites against DJ Danger Mouse, because of his remix of Jay-Z's *Black Album* with The Beatles *White Album*, *The Grey Album*, or against Alexander Galloway because he created a video game, *Kriegspiel*, based on Guy Debord's game of the same name, show how copyright laws and intellectual property render cultural heritage inaccessible and artistic remixing illegal. Even though Debord was openly against copyrights, his widow, who had inherited his estate and thus the copyrights for his board game, perused Alexander Galloway in the court of law because of his remake of the game, which was given away for free on the internet. (Rinehart & Ippolito, 2014, pp. 143–147)

user activities. In new media art, the term interactive is most commonly used in order to point out the dialogical component of the works and to stress the spectator's active position in the process of perception as well as his creative influence on the construction of work.

According to certain aesthetic approaches (e.g. theories on the aesthetics of reception by Umberto Eco, Wolfgang Kemp and others or Arnold Berleant's aesthetics of engagement) all art is inherently interactive because it is open to the interpretation on behalf of the beholder (Berleant, 2010; Eco, 1987; Kemp, 1992). Marcel Duchamp states in his lecture *The Creative Act* that "the creative act is not performed by the artist alone; the spectator brings the work in contact with the external world by deciphering and interpreting its inner qualifications and thus adds his contribution to the creative act," (Duchamp, 1957). Thus Duchamp is relocating the creative activity partially to the spectator and giving him credit for the aesthetic value of the work.

However, the quality of the interaction proposed by aesthetic theory is inherently different to the kind of interactivity which is aimed at by interactive media art. The spectators' participation in the perception of more traditional artworks takes place on an intellectual, mental level, while the spectator's body is physically involved in the perception of interactive media art. On this way, the body becomes part of the cognitive process. This embodiment of the experience of art is central to interactive media art. The experience thus goes beyond the purely visual through the possibility of touch (Hansen, 2006).¹⁶

This interactivity can take on many different forms. The spectator might be able to edit the work of art, to navigate through a nonlinear story, or to interact with an artificial intelligence. The gateway between man and machine is as variable as the kind of user participation. The Human Computer Interfaces can take on the form of a joystick, a mouse, or a touch screen, which are more common in the everyday use of digital media, but they can also be more experimental, like data suits, head-mounted VR, sensors recording all kinds of information (movement, sound, temperature and even uncontrollable body activities like respiration or heart beat) or entirely new interfaces specially created by the artists for their projects.¹⁷ The spectator thus becomes an active part in the appreciation or even in the creation of the work. The passive spectator becomes active as user¹⁸ of a software application.

The artworks are no stable, temporally and spatially fixed entities, but a multitude of possible realizations that exists only through the activation of the recipient. The artwork consists in an interaction proposition, whose gestalt only becomes manifest in individual realizations. Katja Kwastek describes four phenomenological modes of interaction which are used by interactive media art: experimental exploration, expressive creation, constructive comprehension and communication (Kwastek, 2013, pp. 128–134).

When observing recipients interact with an unknown system, one can often see them explore the system first in the effort to understand how it reacts on ones own input. Recipients execute different actions, or repeat the same action over and over with the goal to understand

16 In his book *New Philosophy for New Media* Hansen stresses the importance of the body in new media in the process of the framing information and thus contradicts Rosalind Krauss, as well as Lev Manovich who are arguing for a continuity of analogue and digital media (Hansen, 2006; Krauss, 2005; Manovich, 2001).

17 Jeffrey Shaw, for example, created a bike interface for *The Legible City* with which the user could navigate through virtual cities.

18 Even though the term user is criticized for its reference to consumerism, the designation of the beholder as user is often used in literature on new media art because it seems to be best suited to describe the significant change in the position of the beholder.

how the feedback response is created and to gain control over the machine in the interaction. Some works have relatively simple feedback responses and can be used intuitively without needing in depth exploration, others are more complex and thus their exploration will be more intense. Again others, like Ken Feingold's *Surprising Spiral* deliberately disappoint the spectator's desire to gain control over the feedback responses. This refusal of empowerment creates a strategic disruption that may irritate the recipient and can cause aesthetic distance.

Once the system's feedback response is understood, or thought to be understood, the recipient can use the system as tool to become consciously creative himself. Many works of new media art allow the recipient to edit content within the rules of the system. Thus the recipient can use the system for his own expressive creation. However this possibility to influence the content of the work is not to be misunderstood as co-authorship, because the recipient cannot modify the predefined parameters of the work.

Constructive comprehension is described by Katja Kwastek as the exploration of the of the symbolic level of the system. This is mostly the case in works that use connections to representational levels such as narrations or symbolic elements. In this case "not only can the rule system of the work be explored; so too can the chosen, configured, or represented elements that contextualize the action in question and give it another level of interpretability" (Kwastek, 2013, p. 130). For example, each element of a hypertextual narrative can be experienced and evaluated on a symbolical level.

Finally, communication describes all interactions that address the recipient as reasoning actor and involve him into intercommunication. This communication can take place directly with the system or can be mediated by the system. However, the communication does not necessarily need to be discursive. The denial of discursive responses and asymmetrical communication can also be part of the aesthetic strategies of the work by creating disruption and thus also causing aesthetic distance.

This four modes of interaction are not mutually exclusive, but can succeed each other or be superimposed and work together in the aesthetic experience of interactive art. They give a possibility for the qualitative description of the interaction strategies in place. However, the quantitative and qualitative measurement of interaction should not be misunderstood as measurement for aesthetic quality. It is rather an attempt to find new grounds for the description of the recipient's individual experience of the work.

This interactivity, the ability of new media to allow the spectator to become active, has lead many to question the artists' position as the author of the work and to speak of the spectator as co-author, co-creator, or co-producer (K. Jones, 2006; Paul, 2006). This notion of the co-author gives the spectator equal credit in the creation of the work. Some works like Martin Wattenberg and Marek Walczak *Apartment* (which will be discussed in length later on), Mark Napier's *P-Soup*, or Andy Deck's online multi-user drawing board *Open Studio* would be blank slates without the visitors' input. In other works, like Graham Weinbren's and Roberta Friedman's *The Erl King* (1982-85, fig.6-7), the spectator can control the narration by editing footage. The spectator thus takes on the role of a movie director. Nonetheless, the spectator has a freedom of action only in the framework laid down by the artist. In *Apartment* the user can insert only a special kind of input (words and text and not sound, or images) and the output is given by the machine according to a code written by the artists. In *The Erl King*



Figure 5: Graham Weinbren & Roberta Friedman, *The Erl King* (1982-85), 1982-85 version, SMC-70 computer, CP/M operating system, custom build video switcher, three laser disc players, Carroll touch screen, one CRT viewing monitor, one CRT touch screen monitor, three laser discs. Installation view, Solomon R. Guggenheim Museum, New York, *Seeing Double*, 2004.



Figure 6: Graham Weinbren & Roberta Friedman, *The Erl King* (1982-85), interactive video installation, filmstill.



Figure 7: Graham Weinbren & Roberta Friedman, *The Erl King* (1982-85), interactive video installation, filmstill.

the narration is framed by the three films the artists put at the user's disposal. The creation of content by the user is thus bound to the rules set by the artists. The artistic intent and major control over the aesthetic experience still lies in the hands of the artists, or to say it in the words of Katja Kwastek:

It is thus clear that, despite the necessity of interaction for the realization of each work, the work itself still cannot be reduced to the moment of its realization.¹⁹ Its workliness is based fundamentally on the inseparability of the recipient's action and the and the manifest entity of the system created by the artist. For even if the work always requires new realizations in order to exist, it is still based on an entity that has been created, that can be described, and that potentially can be conserved. (Kwastek, 2013, p. 167)

Some works of new media art give the user so much liberty that they can be understood as medium or a meta-structure for the creation of art. The interface of David Rokeby's *Very Nervous System* (1983-present, fig.8-10)²⁰ is regenerating the visitor as he moves through the space and produces sounds according to the kind of movement and the visitor's location in the

19 When Kwastek speaks about the moment of the realization of a works she is talking about the interaction process, when the work deploys its full gestalt activated by the recipient and not, as for traditional works, the moment when the artist creates the work in his studio.

20 *Very Nervous System* evolved from *Body Language* and was installed for the first time at Justina M. Barnicke Gallery, University of Toronto, Toronto, Canada in 1984. Since then it has been further developed, enhanced and adapted to technological change. It has been reinstalled numerous times with site specific adaptations on festivals and temporary exhibitions mostly in science and technology museums but also in art museums. Among others it was on display at the *Arte, Tecnologia e Informatica* section of the Venice Biennale in 1986 (fig.9) and the *SIGGRAPH '88 Art Show* in Atlanta in 1988. Between 1986 and 2000 *Very Nervous System* has been on display several times a year at different venues. For a complete list see (Rokeby, n.d.)

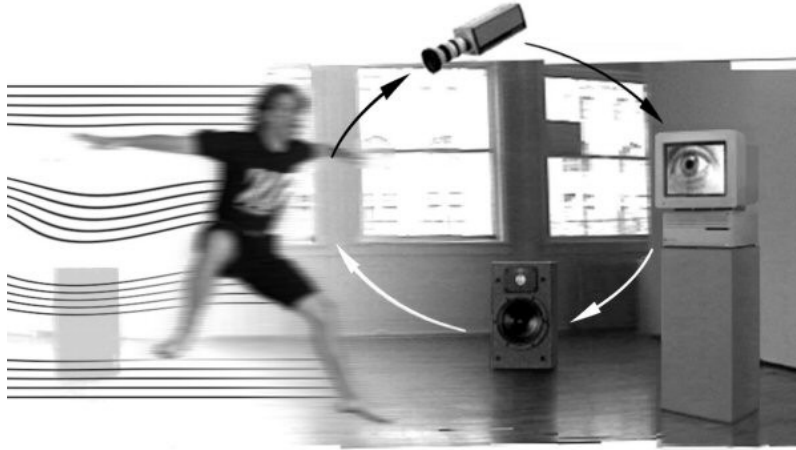


Figure 8: David Rokeby, *Very Nervous System* (1983-present), interactive environment, dimensions vary with installation, operational instructions.

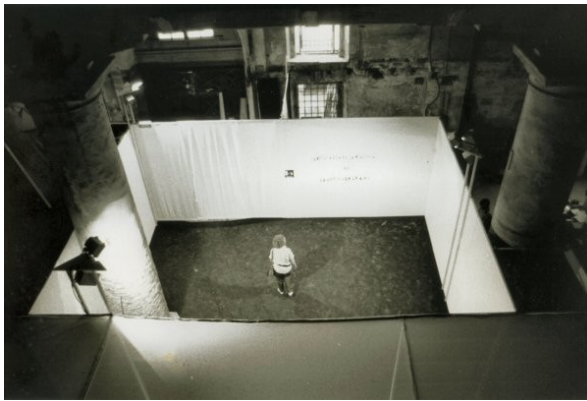


Figure 9: David Rokeby, *Very Nervous System* (1983-present), interactive environment, dimensions vary with installation. Installation view, Venice Biennale, Venice, 1986.



Figure 10: David Rokeby, *Very Nervous System* (1983-present), interactive environment, dimensions vary with installation. Installation view, Carleton University Art Gallery, Ottawa, December 2010.

space.²¹ In *Very Nervous System* the spectator takes on the role of a performer, who creates music with the movement of his body. The System becomes the medium for the creation of sound and movement. The artist himself refers to *Very Nervous System* not as a work of art but as a medium for the creation of art (Dinkla, 1997, p. 154). During some exhibitions it has been used for dance performances and Rokeby sold his system to around 20 other artists who used it for their own artistic production.²²

Here again, the creative liberty of the user is framed by rules and conditions, a meta structure, which is set by the artist. The artistic intent and thus the credit still lies within the artist or group of creates.²³ The use of *Very Nervous System* by other artists or by the audience in order to create works of art can be understood on the basis of recycling, ready made and open source culture. Artists are free to use whatever material in order to create their art. The

21 Small and slow movements produce soft sounds (e.g. bod noise like breath of heard bead or burbling of water) and quick movements produce chaotic, blurred, loud sounds, yet the system response never becomes entirely predictable. Body and system respond to each other in continuous feedback reactions.

22 e.g. Bruno Spoerri, Toni Dove, Mashiho Miwa/Akke Wagenaar, Steim, Eric Rosenzweig/Screen, David Saltz, Paul Garrin (Dinkla, 1997, p. 159)

23 This problem will be addressed in the chapter 3.3.1 *Author*, offering further reflections on authorship and on the problem of writing captions for developing works with audience participation or which are used by other artists in order to base their own creative work on it.

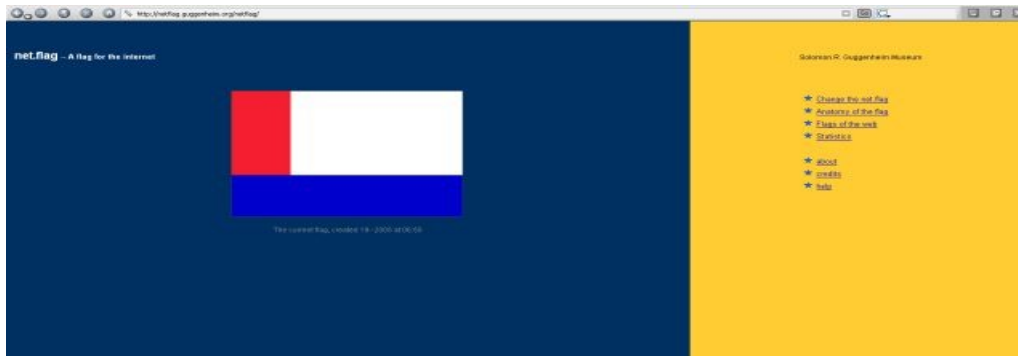


Figure 11: Mark Napier, *Net Flag* (2002), interactive software, screenshot, Solomon R. Guggenheim Museum, New York.



Figure 12: Collection of user generated flags created with Mark Napier, *Net Flag* (2002), interactive software, Solomon R. Guggenheim Museum, New York.

history of cultural production can thus also be used as material for future artistic creation.

In terms of its interactivity new media art stands in the tradition of 20th century avant-garde movements like fluxus, Viennese Actionism, and concrete music. Regina Cornwell comprehensively traces the generation of interactivity and audience participation from Allan Kaprow's *Happenings*, Robert Rauschenberg's reactive environments, Yoko Ono's participative events and Valie Export's closed-circuit installations to interactive media art (Cornwell, 1992).²⁴

The kind of interaction aspired in the 60s is indeed comparable to the one of interactive media art. The role of the spectator in Yoko Ono's *Painting to Hammer a Nail* (since 1961), for example, is similar to the one in Mark Napier's *Net Flag* (fig.11; 12). In *Painting to Hammer a Nail*, which was originally part of Ono's book *Grapefruit* containing instructions for the reader to perform and of whom she created different version, the spectator is instructed by the artist to hammer a nail. One of these pieces consisted in a wooden panel with a hammer

24 Artists like Allen Kaprow or Robert Rauschenberg called upon the responsibility of the observer and their interventions aimed to break with established Kantian aesthetics of the distant observer. In his book *Assemblage, Environments, and Happenings* Kaprow goes so far as to call the inactive observer a waste of space: "All the elements — people, space, the particular materials and character of the environment, time — can in this way be integrated. And the last shred of theatrical convention disappears. For anyone once involved in the painter's problem of unifying a field of divergent phenomena, a group of inactive people in the space of a Happening is just dead space" (Kaprow, 1965, pp. 195–196).

attached to it and the instructions to hammer a nail into the wood. In another version dated to 1961 the spectator was asked to use any surface in the gallery including mirrors and glass. The artist thus provided the spectator with the materials and instructions for an action, which has to be executed by the spectator at his kipper. The piece puts an emphasis on the process of addressing the audience and the action to be performed, which can be constructive or destructive.

Net Flag is an online software interface exploring territorial identities. The user can use forms and colors from existing national flags in order to create a new flag, “to reflect their own nationalist, political, apolitical or territorial agenda” as Napier states on his homepage (Napier, n.d.). The starting point is always the last flag created by a former visitor. The new flag will be displayed on the front page until another user makes a modification and afterwards it is stored in a database. *Net Flag* takes into account that the virtual territory of the internet is situated somewhat beyond national boundaries, what does not hinder countries and their agencies to claim power over it and to attempt to control it.

Both, Ono's participative events from of the 60s and the piece of net art provide the visitors with the means to become active participants. Both supply the materials and tools – the hammer and nail and the software respectively – necessary for the creative act on behalf of the beholder. In both cases, the artists sets the rules for the interaction but assumes a passive role after the publication of the work and maintain no control after its release. However, while in both cases the audience becomes active in the work of art, the motives and goals are very different. Whereas the 60s art wanted to shock their audience, attack bourgeois values and bring art and life closer together, interactive media art often explores social implications of technologies and alternative usages such of. The instructions given by the artists in the happenings and events in the 60s are replaced by immaterial code in interactive media art. The interaction between audience and system is generally intuitive. The different interfaces, sensors, motion captors, joysticks, mice, touch screens, etc., allow the machine to interact with the spectator whereby the spectator does not necessarily has to fully understand the rules of the interaction or how the system will respond to his behavior.

Interactive and participative art forms were always challenging for the institutional art world and developed mostly outside of the traditional art institutions. Most happenings, performances and participative events took place on the streets, in cafes, or in independent theater spaces organized by the artists and artist groups themselves. Artists working with interactive media art also organized themselves outside the museums on the internet or created their own venues.

Christiane Paul, new media art curator and professor for visual arts, argues that interactive media art would break with fundamental conventions of the museum:

The potentially interactive and participatory nature of new media projects – which allow people to navigate, assemble, or contribute to an artwork in a way that goes beyond the interactive, mental event of experiencing it – runs counter to the basic rule of museums, 'Please do not touch the art.' (Paul, 2006, p. 6)

Institutions like the museum regulate the behavior of visitors. Tactile modes of experience are closer related to mass society. As Erkki Huhtamo points out in his article *Twin-Touch-Test-Redux: Media Archeology Approach to Art, Interactivity, and Tactility*, user interfaces and tactile machinery first appeared in amusement arcades and their introduction

into the museum environment contributed to its crisis (Huhtamo, 2010, p. 82). Tactility reduces aesthetic distance and thus runs counter usual museum strategies. Indeed the touch, or tactile perception often played a role for the perception of artifacts outside of the museum. People frequently touch the feed of the sculpture of a saint for example. However, the art museum suppressed this possibility of touch in the perception of artifacts. The typical museum's spatial and ideological design is created in a way that it suppresses tactility and the introduction of tactility, not only through new media art creations, questions the museums regulating function (see also Couchot, 2010, p. 189).

The visitor has certain expectations for the visit of a museum or gallery and adopts his behavior by passing over the boundaries of the museum space. The rule not to touch the works of art, judged necessary for the conversation of painting and sculpture, is only one of many learned and culturally reinforced behaviors adopted in the museum space. Others would be to be quiet, respectful, not to eat nor drink nor run, etc. Indeed, these behaviors are so deeply rooted that they may be difficult to break with. Visitors might be reluctant and do not dare to touch the works even though it is essential to interact with them. Beryl Graham described how in the exhibition *Serious Games*, he curated in 1996 and 97 for the Laing Art Gallery in Newcastle and the Barbican Art Gallery in London, guards and gallery assistants were instructed to encourage the visitors to touch the artworks and to guide them in their use (Graham, 2008, p. 197). Furthermore, each work was accompanied by an informative panel including an image of the project, a conventional description, and instructions on how the interaction with the work could proceed. At the media art festival *Ars Electronica*, held yearly since 1979 it is common that the artists or creators stay close to their works, not only in order to ensure their functionality and repair them if necessary, but also in order to explain them and give suggestions for their use or interact with the work themselves in order to present possible ways of interaction. In this context, the artist can become a performer, leading the experience of the recipient (Kwastek, 2013, p. 93).

Especially when placed with non interactive works, the museum has to make sure that visitors understand clearly what they are allowed to touch and what should remain untouched. Caitlin Jones and Carol Stingari, collaborators at the 2004 Guggenheim exhibition *Seeing Double*, explains the problem as following: "Unless we explained the works carefully, some would lack meaning because the public would fail to engage with them; others would crash and burn because the public would press buttons on works not meant to be interactive" (C. Jones & Stringari, 2008, p. 223)

The kind of interaction experienced by the spectator depends on several factors. Katja Kwastek mentions previous experiences with similar works and the resulting expectations for the interaction, as well as the willingness of the recipient to participate as factors modeling the interaction (Kwastek, 2013, p. 94). The way the exhibition space is constructed, be it a museum space or other, is also a predominant factor for the kinds of interactions encouraged. The environment can encourage different kinds of interactions. The neutral setting of the white cube might encourage another approach to the work, even discourage interaction, whereas the animated atmosphere of amusement arcades encourages it. The way people interact with the works depends on the context given by the environment. The previously discussed work *Very Nervous System* by David Rokeby has been installed several times under varying conditions. In 1991 at the *European Software Festival* in the Munich cultural space

Gasteig *Very Nervous System* was installed open to and with inclusion of the exhibition space. The spectator became a performer through the interaction with the work, exhibiting themselves for all other visitors to see. This setup enabled a kind of interaction, where the recipient can choose not become active, but to observe the other participants interact with the work. Katja Kwastek calls this kind of interaction, where the recipient experiences the work through the observation of others, vicarious interaction and argues that this kind of distant experience would not necessarily be subordinate to active participation. Vicarious interaction would create the distance to the artwork that is often required by aesthetic theories. What is central to the aesthetic experience is “the relationship between active realization and distanced observation, and that between action and reflection” (Kwastek, 2013, p. 97).

The way space, not only the immediate space of the artwork, but also the space surrounding it, is organized, can influence this relationship between distant observation and active realization, between vicarious and active interaction. David Rokeby experimented with different spatial settings for his interactive environment *Very Nervous System*. At the 1993 exhibition *Künstliche Spiele* at the Medien Labor also in Munich Rokeby's work was installed isolated in a space in the basement resulting in a private and intimate atmosphere. The exhibitionist effect was limited, but so was the possibility for vicarious interaction. The more intimate atmosphere facilitated the access to the work especially for more shy persons, but did not allow for other visitors to observe ones behavior. The example stresses how the set up and the environment can inspire different kinds of interaction with one work. The overall environment has to be set up in a way that facilitates and encourages the kind of interaction intended by the artist.

Finally, interactive media art, and interactive art in general also has an influence on the museum environment, which is more profound than just the break of the rule not to touch the artworks. Since their emergence in the 18th century the modern museum cultivated a certain image of themselves. The traditional art museum is proliferated as a calm and quiet place in a hectic and chaotic world, a place for study and intellectual enlightenment, a place where the world can be left outside in order to allow the pure appreciation of the art in a Kantian manner. Interactivity challenges this image of the museum. Interactive media art does not only bring sound and the moving image to the museum space, which are both challenging in their own way, but it emphasizes the movement of the body and the role of the spectator. Interactivity transforms the space from a calm space for study and education to a space animated by sound and movement which might be closer to the aesthetics of an amusement arcade than to those of a traditional art museums.

2.5 Immateriality

The Oxford English Dictionary defines immateriality as “spiritual, rather than physical”, as synonym to incorporeal, not material, bodiless. Writers and theorists associated with the Italian Autonomia, or New Left movements influenced by Marxism were increasingly interested in the consequences of immaterial information systems and communication networks for cultural, political, and social life (see Krysa, 2008, pp. 90–93). Maurizio Lazzarato's concept of immaterial labor theorized a new form of organization of work “which is defined as the labor that produces the informational and cultural content of the commodity” (Lazzarato, 1996). When considered under this angle it becomes clear that art as well as curating are inherently immaterial since it participates in the creation of immaterial or cultural

goods. It is “the activity that produces the 'cultural content' of the commodity, [it] involves a series of activities that are not normally recognized as 'work' - in other words, the kinds of activities involved in defining and fixing cultural and artistic standards, fashions, tastes, consumer norms, and, more strategically, public opinion” (Lazzarato, 1996).

Immaterial goods, not only art, but also every commodity having a cultural or informational character are also distinguishable through their relationship between production and consummation. In contrary to material goods, immaterial ones are not destroyed in the process of consumption. The immaterial good rather “enlarges, transforms, and creates the 'ideological' and cultural environment of the consumer. This commodity does not produce the physical capacity of labor power; instead, it transforms the person who uses it” (Lazzarato, 1996).

Thus art, not only new media, but art in general, is inherently immaterial in terms of Lazzarato's concept. However, in most traditional art the immaterial, cultural value is embodied in some kind of physical object, a sculpture or a painting. In the sense of materiality as physical characteristic, it can be said that new media art objects have a material component, the hardware, and an immaterial one, the computer code that controls it.

Works of interactive media art need furthermore to be activated in order to be perceivable and this not just in an ontological or hermeneutic sense in which each object exists only when “actualized by human perception” (Broeckmann, 2010, p. 199). In Interactive media art, or in art making use of the participation of the spectators, the work only exists when it is individually realized by the spectator.

The material of art can become signifier and carry aesthetic value. Also new media art even though interaction processes and immaterial code are decisive for its perception, is still deeply attached to materiality. The interaction is mediated by the physical qualities of the interfaces. However, it is questionable in how far the materiality is important for the aesthetic experience. The hardware components are often interchangeable, especially when standardized of the shelf hardware is used. For much interactive media art it is little important, which specific types of projectors or sensors are used as long as they correspond to certain standards. For net, or computer art, and art using locative media and PDAs the hardware is even changed every time the work is activated. This is because the recipient is experiencing the works on his personal media devices. Thus, it is not so much, that interactive media art is immaterial as such, but that its materiality is interchangeable.²⁵

Blast Theory's *Rider Spoke*, which has been first performed in London in 2007 and then once again in Linz in 2009, proposes the spectators to run through the respective cities by bike and to record their own voice at places of their choosing. The technical set up of this work is relatively simple. Nine recipients can borrow a bike with an Internet-capable tablet computer and a pair of earphones, technology almost every recipient has at home or has been in touch with otherwise. After a short introduction, the recipients can take a so prepared bike and ride through the city. They will soon here instrumental music followed by an introductory text:

25 However, there are also examples of media art works for which the aesthetics of the machine itself are important. Tiziana Caianiello for example is convinced that video art is best experienced on the projection device it was first shown on, or if this exact device is not available on a machine of the same make and model or at least from the same time. This is because, even though the image can be separated from the image carrier and the screening technology, those devices have still an impact on the aesthetic experience of the work; a digital TV does not have the same qualities as a cathode tube television and video tape does not have the same aesthetic qualities as DVD, etc. (Buschmann & Caianiello, 2013, pp. 40–46)

This is one of those moments when you're on your own. You might feel a little odd at first, a bit self-conscious or a bit awkward. But you're all right, and it's OK. You may feel invisible tonight, but as you ride this feeling will start to change. Relax, and find somewhere that you like. It might be a particular building, or a road junction. It might be a mark on the wall, or a reflection on a window. When you have found somewhere that you like, give yourself a name, and describe yourself. (Kwastek, 2013, p. 250)

The recipient then can make a recording of his choosing, present himself or a fictive character and continue his ride, which will then be interrupted again by the voice asking the recipient a series of questions. The recordings can be listened to by the other participants, but only, if they are roughly in the same spot. The experience of the work depends on the refusal or willingness of the participants to reveal personal details of themselves or of their fictive character (Kwastek, 2013, p. 250). The physical material, the tablet computer and the earphones merely facilitate the interaction of the participants but are themselves interchangeable. They could be replaced by every device that performs the same functions.

The abandonment of concrete, physical objects in favor of processes in new media art conflicts with the customary object-hood museum curators are used to deal with. Like some other characteristics of new media discussed in this paper, physical immateriality is not exclusive to new media art, but it has gradually been introduced into art, starting with the disappearance of the represented object from impressionism over cubism to abstract art followed by the dissolution of the art object itself in the 1960s. While the phenomenon dates back to over one hundred years, the immaterial artwork in the sense of not being a physical object has always been rather an exception than the rule in the mostly object-based art world. Art practices like performance, happening, sound art, or other process based art forms remain problematic for the art museum.

The commitment to object-hood even goes so far that randomly produced objects take the place of the artistic process, e.g. the performances or happenings they may result of or that objects and documents are especially assembled or even created by the art world in order to replace the process-based original in exhibitions. When, for example, a performance or a happening is subject to an exhibition museums often show objects from or documentations of an event, such as photography, video footage, or text, instead of recreating the original, immaterial event. Even though such reenactments cannot be taken for the actual event, they would give the visitor a better and more accurate impression of the original's sensual experience than the remaining objects and assembled documentation.

There are also exhibitions of new media artworks which have been replaced by material, static objects. Mark Napier's net artwork *Net Flag* for example has been shown at the exhibition *World on a Wire* (2012) at the bitforms gallery, New York, specialized on ephemeral and time based media, and in 2001 at the Big Screen Plaza, Eventi Hotel, also in New York. In both cases the immaterial artwork, the software application with which flags can be created was not on show, but rather the result of the work, the flags created by the visitors. Thus, the immaterial object has been replaced by material, fixed representatives.

But where does this reluctance towards immaterial objects come from? Why is it problematic for museums to exhibit performances, happenings and other process based art forms? One nearby argument can be found in the organizational structure of the museum. Museums are simply not used to organize performances on a regular basis. In order for a museum to show a piece of performative art as performance and not as object, it needs the

necessary infrastructure and organizational skills. The museum would need an appropriate room for the performance to take place and the necessary sound and light technology. Instructions for the performers based on the artist's instructions, the relics and the documentation of the original performance, etc., would have to be prepared and repetitions would have to take place eventually.

The Museum for Modern Art (MMK) in Frankfurt made some experiences with the presentation of performance in a permanent exhibition. The male dancers of the *Terrorschwestern* are animating Felix Gonzalez-Torres' *Untitled (GoGo Dancing Platform)*, 1991 (fig.13), and Elaine Sturtevant and Felix Gonzalez-Torres *Untitled (GoGo Dancing Platform)*, 1994, thus restoring the works' original designation. The gogo-dancers become part of the materials of the work and are also mentioned in the caption reading: *wood, light bulb, acrylic paint, electronic cable, male gogo-dancer in silver short with Sony-Walkman*. The dancers are essential part of the material of the work; the dancing platform would be incomplete without them and the work would completely change its meaning.

The Guggenheim Museum also made experiences with the re-creation of historical performances. In 2005, Abramović re-performed iconic performances of Vito Acconti and Bruce Nauman, thus proposing a different way to experience the work, the Guggenheim had previously displayed only on video tape only. In this case one can ask who has the right to re-perform these works. Marina Abramović, herself a well established performance artist, could have been seen as a more legitimate performer than just other person. Nevertheless, the example shows that institutions can choose in which way they want to present performance art in their gallery spaces in order to keep it alive and preserve its original spirit.

The question of the feasibility of the regular presentation of performances and other process based art might be secondary to the question of power and control. The appropriation of the meaning and the significance of an artwork is traditionally bound to its presentation in the museum (Krysa, 2008, p. 92). The notion of control involved in the curation process reveals a certain authority over an artwork and ultimately, the production of meaning. In process based art the curator has to give up a part of control. While in performance and happening the spectator and the performer have influence in the perception of the artwork and

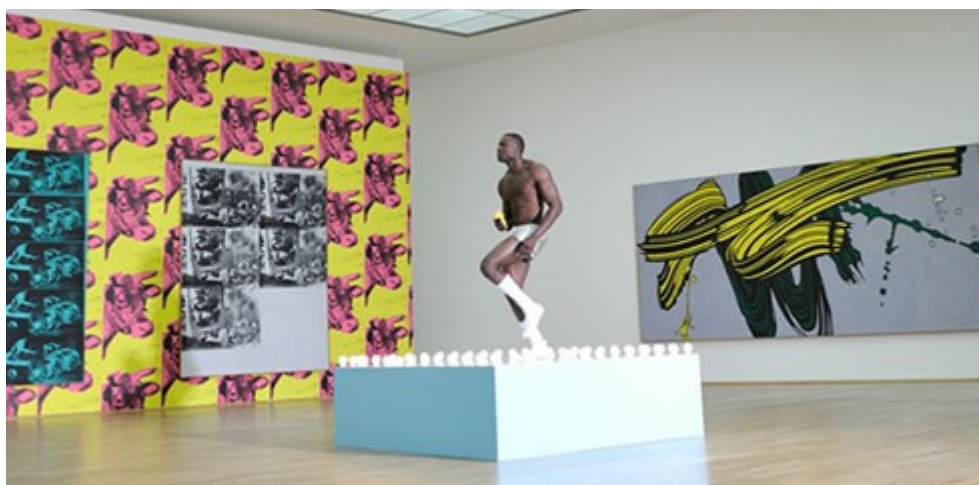


Figure 13: Felix Gonzalez-Torres, *Untitled (GoGo Dancing Platform)* (1991), wood, light bulb, acrylic paint, electronic cable, male gogo-dancer in silver short with Sony-Walkman, Museum für Moderne Kunst, Frankfurt am Main.

thus it's meaning, in new media art, the artwork itself may develop unpredictably. For example computer art, like virus, can be self-replicating, self-regenerating, and mutating beyond the control of the programmer or curator. In much new media art the spectator takes over parts of the role of a creator by modifying and adding to a work or simply by choosing a path through a nonlinear narrative. On this way the immateriality of new media art defies the very function of the museum and the curator as producer of art historical meaning.

While some kinds of interactive media art, like installation or environment, have also a material component, which can be shown in an exhibition context, others, like net art, are entirely made out of immaterial code. Net art is made for the immaterial environment of the internet. This environment has the specificity that everybody can build context in real-time through the creation of links, marks, or comments, etc. The constant re-configuration of context on the internet moves net art away from the traditional pre-scripted model of interpretation and construction of meaning and allows to take on multiple meanings in multiple contexts. This specificity of the net environment cannot be transferred unconditionally into the museum environment.

When it comes to the exhibition of net art, the organizers have to solve a number of questions about how to enable access to the immaterial code and how to display it: Should the work be accessible from an interface in the museum only or should it remain accessible online also? How should the physical interface look like and how does it influence the experience of the work?

Depending on how these questions are answered the physical interface granting access to the immaterial work might look differently. The net art object *Apartment* (fig.14)²⁶ by Martin Wattenberg and Marek Walczak has been shown several times at different venues always with an altered configuration. In 2001 *Apartment* was shown as a single user interface at the *Data Dynamics* exhibition at the Whitney Museum of American Art, New York. Visitors could create 2D apartments at a work station while the 3D dwellings were projected on a wall (fig.15). Although the input station replicated the intimacy of a personal computer, the output was shared publicly through the projection. The installation at *Data Dynamics* was the only version where visitors could print out their apartments to take them home (Paul, 2006). In the same year at the *Ars Electronica* festival in Linz *Apartment* was installed with two 2D input stations with the 2D and 3D components were projected next to each other on the wall. The installation at *Ars Electronica* also included an archive of apartments created by visitors during the exhibition. For the *Electrohype Festival* in Sweden in 2002 the artists created a less elaborated interface (fig.16). The web page could be manipulated through a projection-table. This simpler approach probably comes closer to the original reception on a personal computer.

In each of these cases the physical interface was different although the immaterial code

26 *Apartment* explores the relationship between language and space, building a 2D and 3D apartment in response to the viewer's typing. When the *Apartment* is entered, the viewer is invited by a blinking cursor to enter a text. The software recognizes the words and regroups them under the related themes they express. The words then appear blinking and floating in the corresponding rooms of a blueprint like representation of an apartment, eventually lining up to new semantic fragments. For example, words related to eating will appear in the dining room. The more words are added to one room, the bigger it becomes. The apartments are then assembled into buildings and cities according to the semantic relationship of their words. The viewer has also the possibility to visit and add to apartments constructed by former visitors.



Figure 14: Martin Wattenberg and Marek Walczak & Jonathan Feinberg, *Apartment* (2000), interactive software, screenshots: from left to right: 2D simulation; 3D simulation; 3D simulation (detail).



Figure 15: Martin Wattenberg, Marek Walczak, & Jonathan Feinberg, *Apartment* (2000), website and networked installation, computers, printer, desk, and projector. Installation view, *Data Dynamics* at Whitney Museum of American Art, New York, 2001.



Figure 16: Martin Wattenberg, Marek Walczak, & Jonathan Feinberg, *Apartment* (2000), website, projection table. Installation view, Electrotype Festival, Malmö, Sweden, 2002.

remained substantially the same. The reception of the work might change with the decisions that have been made according to the approach chosen to render the immaterial code visible. The interfaces which have been conceived to transfer the artwork from its original context, the internet to the museum space influence the reception, and thus the interpretation of the work. For the, successful exhibition of new media art museums will have to get used to changing, unfixed, unpredictably developing, immaterial objects.

3 Traditional Museum Functions Challenged by New Media Art

Since the creation of the modern museum, the general museum functions did not change. From the creation of the Louvre in the under Napoleon I until today museums are mainly concerned with the collection, exhibition, preservation, documentation, and mediation, of culturally valued objects. Whereas the focus might have shifted, museums have always been concerned with these five functions.

Interactive media entered only slowly into the museum world. The previous chapter was oriented on the difficulties related to the inherent properties of new, interactive media art. This

chapter will shift its focus to the functioning of art museums. New media art challenges each of the typical museum functions in its own account. The collection of new media art might reveal itself difficult because it has no income model or because it is itself still a relatively new practice whose future value is still uncertain. Furthermore its insertion into the white cube environment of the museum does not necessarily proceed smoothly because new media has different spatial requirements than other media. The need for a special equipment for the exhibition of new media has already been discussed in the previous chapter. The focus here will lie on the more general spatial settings between white cube and black box.

Interactive media art uses an especially ephemeral material, whose preservation is challenging for art restorers because the typical restoration methods do not apply. The chapter on restoration will present and compare a wide range of new methods apt for the preservation of new media. However, museums will probably have to get used to the idea that no matter what efforts are taken for the preservation of new media art, the objects will change eventually, and that this change is not necessarily a bad thing. The documentation of new media is challenged, not only because the usual vocabulary does may no longer apply, but also because the works are variable, and therefore changing over time. Finally, new media art questions the museum's position as context provider and the hegemonic way of construction and mediation of cultural meaning.

3.1 Collecting

Collecting is one of the main functions associated with museums and often precedes the exhibition²⁷ and preservation of an artwork. Through the act of collecting, museums decide which parts of visual culture is worth preserving for the future, thus taking actively part in the construction of public memory. In his works *Ma Collection* and *Museum of Modern Art* (1971), *Eagles Department* (1972) the Belgian artist Marcel Broodthaers ironically circumvents the relationship between the attributed cultural value of an object and its being part of a collection. He comments on the creation of memory through the proximity in a collection: "Collecting is a form of practical memory and, among the profane manifestation of 'proximity,' the most convincing one" (Krauss, 2005, p. 41).

While some art museums started to engage more frequently in the exhibition of new media art in the mid 1990s, they still have reservations concerning its actual acquisition and collection. Dieter Daniels tries to explain this abstinence with the low marked value²⁸ of new media art. Although some authors see a chance for the acquisition of new media art in the low price – museums should buy works as long as they are still affordable – the low marked value might actually have the opposite effect. Museums prefer to invest in sure values, and a high marked value is generally seen as proof of artistic value: "Die Evaluation von bildender Kunst folgt schon immer – und angesichts einer grassierenden Kriterienlosigkeit sogar mehr denn je – ihrem Marktwert." (Daniels, 2004, p. 69). Consequently, when cultural value is correlated to market value, which in turn seems to be dependent on rareness, new media art, which is technically reproducible and therefore generally not rare, will be little valued and in the following little collected.

27 Even though exhibits are often on loan, especially in temporary exhibitions, it increases the chance for a work to be exhibited when it is part of a collection.

28 At the moment, there is not yet a marked for new media art. Its low price is sometimes explained by its possibly endless reproduction.

Another reason for the institutions' initial reluctance can be found in the often criticized relationship of museums with new art movements in general. Since their foundation in the 18th century, museums understand themselves as the guardian of high culture and artistic quality. Artworks have to prove worthy for a place in eternity. Since new art has by definition not yet proven its historical value, its acquisition is often controversial. As Bruce Altshuler puts it, there are two fundamental conflicts between traditional museum functions and new art:

First, contemporary art conflicts with the traditional notion of the art museum as an institution that preserves works that have withstood the taste of time, placing them within an art historical narrative in which new works have no definitive place. Second, with the creation of museums devoted to 'modern' and 'contemporary' art, the focus of the new was found to conflict with the traditional museum goal of preserving its holdings in perpetuity. (Altshuler, 2005, pp. 7–8)

Indeed, museums, which were created in order to collect only art younger than a certain age and to emit them after a certain amount of time often changed their practice in retrospect. A prominent example is the collaboration between the Museum of Modern Art and the Metropolitan Museum in New York. When the MoMA was opened under the direction of Alfred Barr in 1929 it was conceived as a museum for living artists only. Holdings older than 50 or 60 years should be moved from the Museum of Modern Art to the Metropolitan Museum. In 1951 the museum's second director Rene d'Harnoncourt annulled the arrangement in favor of a more conventional collecting policy. It became important for the museum to hold on to its collections what reintroduced its preference to invest in sure values.

After the Second World War institutions for the collection and preservation of contemporary art multiplied. Their devotion to contemporary art is often emphasized in their titles and should resolve the museums' conflict concerning the new. Which paradigms and norms does their collecting activity follow? The often criticized uniformity of collections of contemporary art (e.g. Ammann, 2000, p. 59) seems to confirm the institutions' drive for security and thus the collecting of sure values. Jean-Christophe Ammann, former director of the Museum of Modern Art in Frankfurt, identified three mayor behaviors in the collection practice of contemporary art. Curators who want to stay on the save side buy recognized artists with their available funds, even if the works does not necessarily integrate in the context of the collection. Curators who feel insecure about the development of contemporary art would try to spread the risk by buying a number of different artists and styles. Finally, curators who are driven by a vision will purchase small groups of works of one artist or by an artist group (Ammann, 2000, p. 22). The last group would be the most sensitive for the collecting of new media. Indeed, the collecting and exhibition activity of new media art is driven by a number of curators, Steve Dietz, Benjamin Weil or Christine Paul, rather than by the investment of particular institution.²⁹

When an institution decides to buy a piece of new media art, they will have to ask themselves what exactly should be bought. Is it enough to acquire the code for a program or is it necessary to invest into the necessary hardware as well and what kind of hardware should be collected? Does the museum purchase an edition of the work or does it obtain the copyrights? Can the artists and other interested persons be allowed to continue using the work to base other creations on it, like it would be the case of open source software, or are all rights

29 Sometimes curators even had to leave their institutions because their engagement for new media art was judged as inappropriate for their institution.



Figure 17: Antya Umstätter, Steffen Meschkat & Axel Schmidt, *Ping* (1994), interactive software, installed at *Siggraph*, 1995.

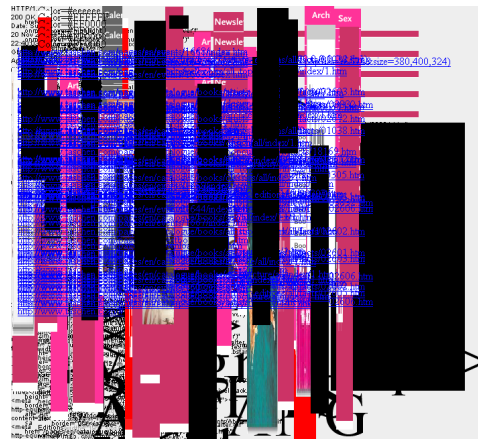


Figure 18: Mark Napier, *Shredder 1.0* (1998), interactive software, screenshot, www.poptatoland.org.

preserved to the buyer? In the case of networked or distributed creations when several authors contribute freely, and sometimes anonymously, to a work of art, it might be uncertain who the work actually can be bought from. Furthermore, institutions should estimate the cost concerning the preservation and eventually the presentation of the work. These questions have to be discussed with the concerned parties before the acquisition and decided from case to case. At the moment there is not yet a general policy across institutions for the regulation of these concerns.³⁰

When institutions buy a piece of new media art, they should do it in a way that is future oriented. That means that they should also think about everything that they might need for its future preservation. Jon Ippolito and Richard Rinehart recommend in their book *RE-Collecting: Art, New Media, and Social Memory* that 20% of the funds of the acquisition of the work should be put aside for its future preservation (Rinehart & Ippolito, 2014). This might also include buying a stock of the necessary hardware, or look if the context of the work needs to be preserved as well.

New media art is a highly context driven form of art. It often uses context found on the internet in order to create objects in real time. Artists like Mark Napier, Jodi.org, Marek Walczak, or Steffen Meschkat exploit the rhizomic, hypertextual and collaborative dimension of the web. The interactive, 3D data-scape *Ping* (1994) by Steffen Meschkat, Antya Umstätter, ART+COM, et.al. (fig.17) presents itself as a movie like walk-through through the internet, whereas the content is created in real-time by using the hypertextual structure of the internet. By moving through the data-scape, the user controls the construction of the environment. Visitors of the 1995 *Siggraph* exhibition could virtually jump into the data-scape. Their body thus became part of the virtual environment.

Mark Napier's *Shredder 1.0* (1998, fig.18) manipulates the source code used in the construction of web pages, subjecting it to a script that analyzes and rearranges its structure. With *Shredder 1.0* Napier challenges the usual aesthetics of the internet by deconstructing and

³⁰ Some acquisition strategies are summarized in the chapter 2.3 *Unlimited Reproducibility* (see also Morris, 2001). There are also some initiatives aiming to help collectors preparing their acquisitions. The inter-museum project *Matters in Art and Media* elaborated a so called process diagram for the acquisition and accessioning of time based media. The diagram assembles a number of subjects a collector should familiarize with before the acquisitions of the work like what equipment is necessary, what are the long term costs, or what information do I need for the acquisition of a work.

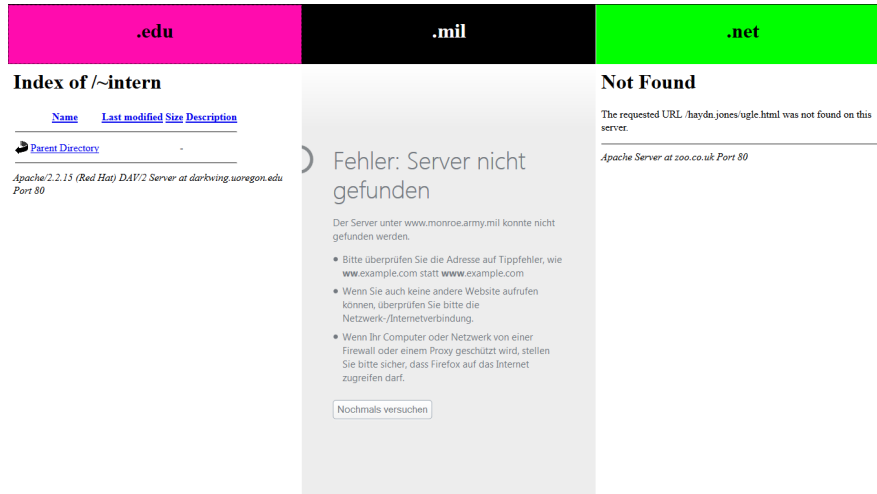


Figure 19: Maciej Wisniewski, *Jackpot* (1996), interactive software, Walker Art Center, Minneapolis.

rearranging its data-structure. Marek Walczak, Martin Wattenberg and Jonathan Feinberg's *Apartment* (2001) uses images based on an internet search of words typed in by the viewers to create the 3D walk-through of a virtual apartment.

All these examples produces content based on material found on the internet. Does the content found on the internet change, so does by consequence the appearance of the works. The exploitation of the rhizomatic characteristics of the internet makes the works vulnerable to changing contexts. Collectors thus have to decide how much of the context is necessary for the perception and the conservation. Even though it is often unrealistic to collect the entire context of a work, museums should at least think about collecting some of it.

In some cases, however, it will not be possible, to transfer the original context of a work into the museum space. [*phage*] by Mary Flanagan is a peace of software art that uses content like pictures, e-mails and documents from the recipients hard drive. The perception of the work depends on the recipients' relation to their own forgotten data. This context cannot be translated into the museum environment, since it is unrealistic that every visitor brings his own computer.³¹ For the exhibition *Seeing Double* at the Guggenheim Museum Flanagan provided her own hard drive. Hence, instead of diving into his own past, the spectator can explore the artist's life.

Although it is not unusual for museums to collect the context of a work of art, e.g. the archives of an artist, sketches, letters, or secondary literature, these collections have rather the function to document the work for the purpose of study rather than being essential to the experience of the work itself. For the preservation of a new media object it can become fatal when a collector neglects to preserve the context of the object. Whereupon the alteration of the work through a change of context might be acceptable in the case of *Apartment* or *Ping* it can completely change the perception and thus the meaning in other cases. *Jackpot* (fig.19) by Maciej Wisniewski is an internet slot machine which randomly selects web pages from a pre-configured database. The user wins, when the top level domains ('.com', '.net', '.org', etc.) match. He then can visit the web site and add a URL of his choice as a price. Since *Jackpot* was bought by the Walker Art Center in 1998 along with Benjamin Weil's *āda web* many of

31 In fact, today, since everybody has a smart phone that can function much like a computer, the work could regain its intended context in the museum, but on a new device.

the web pages from the original database have been disconnected, which is why the slot machine no longer displays the original page as output but a 404 error message. In the case of *Jackpot* the original script has been preserved and is still functioning but the context has changed what results in a fundamental change of the appearance and the meaning of the work. *Jackpot* now is merely an indicator of how the informational landscape off the internet has changed.

The example raises the question of how to collect context driven media art. The Walker Art Center probably should have made the effort to save the web sides from the database, as it would be done today (Dietz, 2005, p. 91), even though this constitutes a considerable additional expense. Now that the damage is done, should the malfunctioning pages be erased and the remaining ones preserved? Another option would be to replace the defected domains with similar, still existing ones.³²

Finally, there is a fundamental tension between the museum's traditional role as a gatekeeper and the internet's wide range and openness. Net art is made for the unlimited access online, which might be contradictory to the museums' role to organize the access to the works. Museums often insist on limited availability or uniqueness for the objects in their collections, while net art is characterized by its democratic structure of access and its unlimited availability, considering someone has access to the internet and the necessary software to read the source code. Furthermore, new media in general can be easily reproduced, enabling the copy-paste and remix methods of some new media artists.³³ It might not be in the artist's intent that the access to their art is artificially limited through the legal restrictions of an institution.

As for traditional donations, which are sometimes bound to the condition that the pieces will be exhibited in a museum's permanent exhibition, new media artists can require the unconditional access to their work to be maintained online for an unlimited period of time. This was the case when the Guggenheim bought Mar Napier's *Net Flag* (2002) along with *Unfolding Object* (2002) by John Simon, one of the very first net art objects to be acquired by a museum. Napier's decision to sell his piece to the Guggenheim Museum was influenced by his desire to secure the accessibility of his work. He states:

Because it is really meant to be a public work, it makes sense for it to be in an institution that will promote it and work with it. It's not the kind of piece that I would sell privately to an individual because it's really so much about democracy. *Net Flag* doesn't work as an edition. You fly one flag on a territory. There's only one on the Internet. (Morris, 2001, p. 21)

Mark Napier's quote very clearly states the advantages of being part of a collection, given that the work remains accessible online. Institutions like the Guggenheim have weight and art world authority that makes it interesting for an artist to be part of its collection.

32 The problem of the preservation of the context is not exclusive for digital art using the internet. As Steve Dietz notes in his article *Collecting New-Media Art: Just like anything else, only different* similar problems can occur with all instruction based art. An example comparable to *Jackpot* would be John Cages *Imaginary Landscape* for 24 performers and 12 radios. The instructions (which is the script in *Jackpot*) are preserved, but the radio frequencies (web sites) do no longer correspond. (Dietz 2005, p.90)

33 In the Pool, developed by Jon Ippolito and Joline Blais and others at the University of Maine's *Still Water Lab* (Bell et al., n.d.), users can use the works of art in order to create new works or further develop them. This open source and networked creativity is often essential to the creation of new media art.

3.2 Presentation

The first exhibition of an artwork is often a key moment in defining a work and in determining its future. It is a first test of its reception and identifies the moment, when a work is perceived as being collectable (Noordegraaf, Hediger, Maitre, & Saba, 2013, pp. 12–13). In addition to the technical difficulties encountered in the presentation of new media art as described in chapter 2.2.2 *Exhibition Equipment* there is a number of other questions concerning the modes of presentation. Is new media art better shown in the white cube gallery or in the black box? Is it possible to take art made for the distribution on the internet from its original context and transplant it into the museum? Can new media art be mixed with other objects in a permanent or temporal exhibition or should it better be shown separated in a lounge or a special cabinet?

Museums are places of historical and intellectual ordering of objects, artificial spaces with the goal to direct the viewer's undivided attention to the works. The goal is to provide an appropriate surrounding for the contemplation of art. The museum space is the result of the philosophical and art historical understanding of art, which is fixed for future uses through the transformation into a spatial formation, so to say taken in stone and concrete (Büscher, Eitel, & Pilgrim, 2014, p. 6). The modern museum space, the white cube, is the architectural translation of the Kantian aesthetics of disinterestedness. The architectural elements, walls, floors, ceilings, windows, doors, etc. in all their dimensions and combinations, separate the inside from the outside. The outside world is to be left outside for an uninterested appreciation of art. The thresholds located at the boundaries between inside and outside, are accompanied with implicit conditions for their crossing, behavioral rules implement to their crossing. The architectural space is connected to the history of the institution and its social function and implies a specific direction for usage, sets a context, and determines behaviors. The gallery setting traditionally encourages passivity (contemplation) rather than engagement (Cook, 2008, p. 35).

3.2.1 Construction of the Museum Space as Path through Art History

Architecturally speaking, the museum space is made of room and path. The artworks, lined up on the wall, build a path foreseen by the curator, which can be followed through the sequence of rooms. Seeing the pictures sequentially, moving from room to room, the spectator is taken on a walk through art history and theory. Frank Lloyd Wright took this spatial expression of art history to its summit by creating a museum space made of pure path. The visitor of the Solomon R. Guggenheim Museum, opened in 1959, takes an elevator to the top level of Frank Lloyd Wright's famous spiral and then moves downwards along the walls. Wright gave up the sequence of rooms which made up museums before in favor of a linear path. This linear space reflects on a linear understanding of art history:

In so far the museum becomes pure path, abandoning the dense spatial rooms of what were once *homes*, or, of course, the highly sophisticated space of a cathedral, it becomes a more perfect image of history, or rather of the single, linear motion of history preferred since Winkelmann. (Fisher, 2012, p. 440)

While Frank Lloyd Wright's museum made of path reflects the modern understanding of a linearly ordered history, post-modernity rejected this horizontality in favor of a non-linear understanding of art history which presents itself more like a web of parallel strings, which are connected at many knots. The Parisian Centre Georges Pompidou, inaugurated in 1977,

was created in the spirit of the 1960s.

While O'Doherty remarked in *Inside the White Cube* that museums keep the outside world apart from the art through the omit of windows, Richard Rogers and Renzo Piano wanted to emphasize the continuity of art and life through the diaphanous glass facade, creating a fluidity between the inside and the outside. In the inside the architect placed an emphasis on variability. Richard Rogers states in an interview with *Dezeen Magazine*: “If there is anything we know about this age it’s that it always changes. If there is one constant it’s change” (Rogers, n.d.), and he wanted the building to be able to adapt to this constant change. He created large spaces on the different levels, twice the size of a football field each, which were interrupted by nothing, completely blank so to say. These spaces were fully scalable and capable to adapt to changing usages through the integration of movable walls. The inside of the museum was constructed to be fully scalable. This flexibility became standard in museum architecture in the 90s (Bartetzko, 2000, p. 135) and it is this flexibility that is necessary for the exhibition of interactive media. Arie Altena sums up a number of different presentation techniques for new media with different spatial requirements that needed to be provided for the festival DEAF organized by the V2_ in Rotterdam:

Because a festival often takes place at many different locations , it is possible to show performances on stage and computer installations in a semi-public space, as well as large installations in a large space, and smaller work in separate rooms. Some works might be projected large on a wall, others screened on a monitor on a pedestal, and some works need a space as a playing field all on their own. Some works require a variety of exhibition modalities. Ideally, it is the work itself that determines the exhibitions modality, yet in reality, compromises are also sought, necessitated by practical concerns. (Altena, 2013, pp. 353–354)

In ideal conditions, the museum space can provide the exact space the work needs for its exhibition. Museums with limited space and fixed walls will never be able to provide these ideal conditions. However, variability allows the museum to adapt their space to the work of art and not the other way around. Compromises will probably not be inevitable, but variability can limit the consecrations that have to be made.

New media art needs “a space for exchange, collaborative creation, and presentation that is transparent and flexible” Paul states in her 2006 essay *The Myth of Immateriality. Presenting and Preserving New Media* (Paul, 2006). The interior needs to be able to adjust to the varying scales as well as requirements for light and sound and the walls and floors may have to hide the technology, which is often perceived as unaesthetic.³⁴ The flexible and moduable space of the Centre Pompidou fits this characteristic.

Jean-François Lyotard's exhibition *Les Immatériaux* held in 1985 in the Centre Pompidou (fig.20) was one of the first exhibitions of new media art in an art museum of this size. The curators imagined an architecture separating the exhibition in five zones corresponding to the five subjects structuring the exhibition: material, materiel, matter, matrix, maternity. When entering the exhibition through a vestibule and a long corridor the visitor arrives at the *Théâtre du non-corps*, interrogating the presence of the body in theater. Here the spectator could choose between five paths, one for each subject. However, the paths were not hermetically sealed but it was possible to slip from one path to another at several points. The exhibition thus created interconnected zones for the creation of meaning. The

³⁴ This is, of course, only given the technology is not essential to the aesthetic perception of the work as intended by the artist.

plan de l'exposition

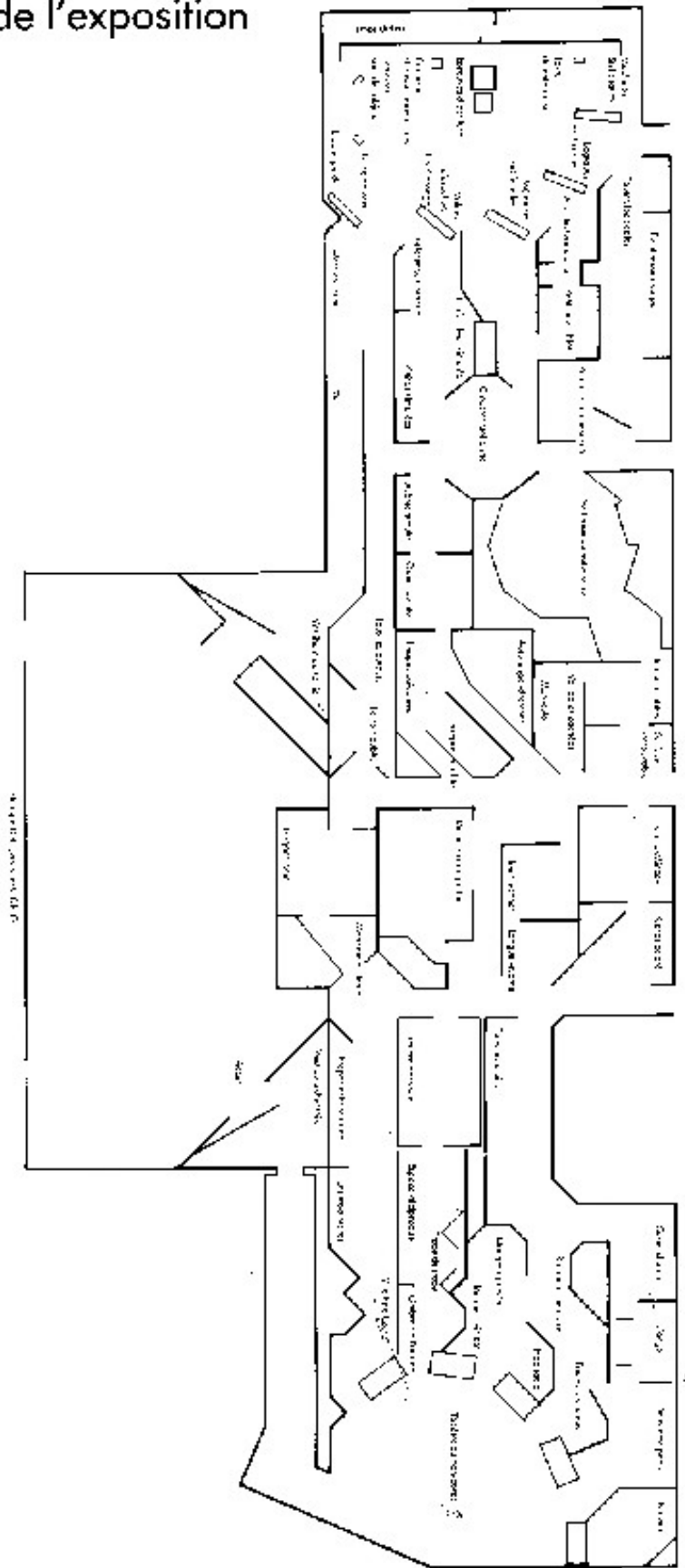


Figure 20: Jean François Lyotard, *Les Immatériaux* (1985), Centre Georges Pompidou, Paris, plan de l'exposition.

exhibition course suggest a network of associations much like in the hypertextual structure of the internet, where hyperlinks create connections between distinct content.

The elaborated plan of the exhibition *Les Immatériaux*, was only possible because of the variability of the museum space itself. However, this flexibility is not without complications. Dominique Bozo decided as director of the Centre Georges Pompidou in 1985 to give up the modulability in favor for fixed walls. Interlocking chambers were built in the shell of the building which are lined up on a wide promenade with a variety of different view axes. The space no longer dictates one path, which has to be taken by the visitor, but proposes a multitude of different paths, thus taken the deconstructed understanding of history of post-modernism into account. The curator has the possibility to suggest an interpretation through the careful arrangement of the works. The specifics of an artwork can be accentuated through the neat confrontation with similar compositions or subject matters, while the ensemble of a cabinet stands exemplary for a movement or a group of artists. The system of view axes and merging spaces allow for the confrontation of the art of different cabinets. Through the compilation of different works, the curator can suggest a selective interpretation of an artistic and art historical type.

Besides the contextualization of artworks through proximity or distance to other works, the space of interactive media art also contextualizes the interactions. The space, whether it is intentionally created or selected by the artist or curator, sets the conditions for the perception of the work. In new media art, the consciously created performative space is often not separable from the space surrounding it. For example, the stage in a theater setting clearly denotes the performative space, even though modern and contemporary theater often aims to break through this boundary. For interactive media art, such a boundary generally does not exist, but there is a fluid continuity between the performative space and the one surrounding it. The spatial setting sets the basis for the relationship between actor and the recipient, whereas the technical system can also be understood as an actor (Kwastek, 2013, pp. 97–99), it enables or discourages specific movements and thus favors certain perceptions while others might remain silent. Thus, the exhibition space itself sets the conditions for the reception and interpretation of the work.

3.2.2 White Cube versus Black Box

Art is particularly sensible to changes in perception. The museum space ultimately sets the conditions for the perception and thus the experience and interpretation of art. The white cube has become a convention for the exhibition of art in the 20th century. It is regarded as providing the ideal conditions for the appreciation of art, underlying its own rules and laws. Its white walls providing a clean surface with no distractions from the contemplation of art. The outside world is left outside and the spectator can contemplate the art in a Kantian, disinterested manner. Isolated in such a way, the artwork is transferred into a new context:

A gallery is constructed along laws as rigorous as those for building a medieval church. The outside world must not come in, so windows are usually sealed off. Walls are painted white. The ceiling becomes the source of light. The wooden floor is polished so that you click along clinically, or carpeted so that you pad soundlessly, resting the feet while the eyes have at the wall. The art is free, as the saying used to go ‘to take on its own life.’ (O’Doherty, 2000, p. 15)

While the white cube is the most common mode for the presentation of most art, new media art does not necessarily fit into it. The darkness often required by screening

technologies used in new media art and the integration of sound stand in direct contrast the white cube.

The black box is a common mode for the presentation of media art, like film or video. Today, these black boxes, isolated from the commerce of the exhibition in order to keep the sound inside and the light outside, can be found in almost every museum for contemporary art. Barbara Büscher suggests that the black box fundamentally assumes the same conceptional role as the white cube: “Das Schwarz der Wände, Decken und Böden suggeriert ähnlich wie das Weiß des White Cube Neutralität, und letztlich die Negierung des konkreten, physischen Raumes. Beide stellen den Zuschauer/Betrachter auf höchste Konzentration ein, auf die Ausrichtung der Blicke, auf das Ausblenden des Außen und fokussieren seine Aufmerksamkeit.” (Büscher et.al., 2014, p. 6).

The black box also has the advantage to adapt to the screening conditions of each media artwork by shutting it out from the rest of the exhibition. The light and sound can be set as needed for a work without having a negative influence on the perception of other works. This enclosing of the artwork through the black box system has the disadvantage that it minimizes the dialogue between the artworks. The experience of the works, even though the curator is probably still seeking for a coherence between the exhibits, can only take place in an isolated manner.

The spectator can saunter around in the white cube and then focus on the works which most attracted his attention. In the black box this is no longer possible. By entering the museum space, the visitor is confronted with a number of distinct enclosed cabinets. He can only discover their content, the works of art, when he enters into a box. The exhibition space can no longer be perceived as a whole, what in turn limits the curator’s possibilities to enforce a selective interpretation. The traditional mode to create meaning through confrontation are minimized in favor of pure experience of art.³⁵

Exhibitions which deliberately do not want to isolate their media art objects in black boxes have to solve the problem of over-stimulation. Due to multiple and overlapping sources of sound and light from different artworks visitors may experience such exhibitions as overwhelming chaos with a tiresome effect, which can be counterproductive to the determined examination of the exhibits. Even though it is technically possible to direct the sound of a piece to one distinct point in space, this technique is still relatively elaborated and expensive, which is why museums rarely use it. The resemblance to amusement arcades might also be intended by the curators with the goal to hint at and encourage interactivity.

What possibilities do museums have in order to avoid such chaos and still have an affordable and conclusive exhibition? The black box system seems naturally more appropriate for the exhibition of media art even though it comes with its own set of problems. Headphones are used in a large number of exhibitions but they seem little appropriate for large numbers of visitors and for the interaction with several spectators. Museums have to reveal themselves imaginative to create an exhibition setting apt for interactive media art.

3.2.3 Mixed Spaces

The Media Museum of the ZKM in Karlsruhe, even though it still largely depends on enclosed, dark rooms, plays with the notion of the black box. In its permanent exhibition on

35 Monographic cabinets for example in the Museum of Modern Art in New York or the Tate in London can be seen as symptomatic for this preference towards the aesthetic experience (Serota, 2000, pp. 82–87)



Figure 21: Laurent Mignonneau & Christa Sommerer, *The Interactive Plant Growing* (1993), interactive installation, SGI Maximum Impact, graphic projector, 5 plants with low voltage sensors and sensor filter, 5 plinths, lamps, real-time graphics, self developed hardware and software. Installation view, ZKM, Karlsruhe.

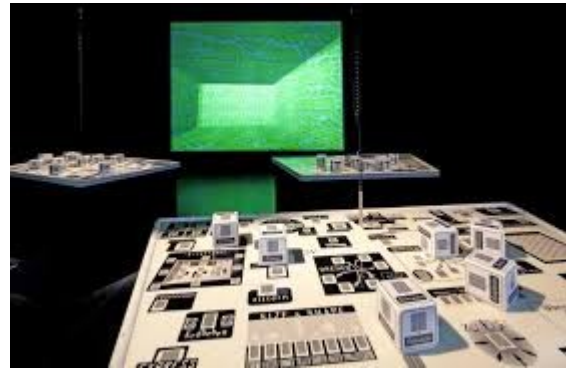


Figure 22: Perry Hoberman, *Bar Code Hotel* (1994), interactive environment, Apus 3000 Power PC (603/180; 48 MB), Maximum Impact Indigo 2 (128 MB), 2 data projectors, projection screen, 2 speakers, 3D glasses, 5 tables with bar-code symbols, 5x5 cm cubes with bar-code symbols, bar-code lightpens, Max Fat 3.5, self developed graphic software. Installation view, ZKM, Karlsruhe.

the first floor there are a number of cabinets lined up around the atrium. Media artworks which are conceived for a more intimate interaction with the spectator, like Jeffrey Shaw's *The Legible City* (1989-1991) or *The Interactive Plant Growing* (1993) by Laurent Mignonneau and Christa Sommerer (fig.21) are presented alone in a dark room, with a sound and light barrier damming up outside influences. In addition to insulate from sound and light, the black boxes creates a private atmosphere. Since the spectator, when interacting with new media art, puts himself on display, this intimate set up also limits the exhibitionist effect the interaction may have. The access to the interaction in such an intimate set up is facilitated for shy persons, who do not like being on display.

In some cabinets however there are several pieces exhibited together, allowing for the spectator to directly compare them to each other. Again others are build more like a corridor than like a closed room so that the spectator can glimpse an impression of the room from the outside. Some of the pieces made for the interaction with several persons, like *Bubbles* by Wolfgang Münch and Kiyoshi Furukawa (2000) or Perry Hoberman's *Bar Code Hotel* (1994, fig.22) are presented in the hall. The exhibition is made in a sort that the sound and light impulses from the pieces do not interfere negatively with each other but build up spaces of meaning.

Even though the exponents are interactive media artworks, with sound and video or animation, the overall atmosphere in the exhibition is not chaotic. The pieces placed in the hall work as eye catchers, directing the viewers attention and path through the exhibition. Black boxes allow for an intimate interaction with a single piece and arrangements in groups for the confrontation of works.

The cinematographic exhibition *Big Picture I* (2001, fig.23) at the K21 Kunstsammlung Nordrhein-Westfalen in Dusseldorf had to face similar problems as common for interactive media art exhibitions. Since the curators did not want to isolate each piece in a single room an imaginative alternative had to be found. The second basement floor of the exhibition hall, the place where the exhibition was held, had the advantage of being a big space with no interior walls. Movable walls could be placed freely. The goal was to create a new, flexibly usable spaces largely avoiding the incorporation of dark rooms and offering an open, flexible path.

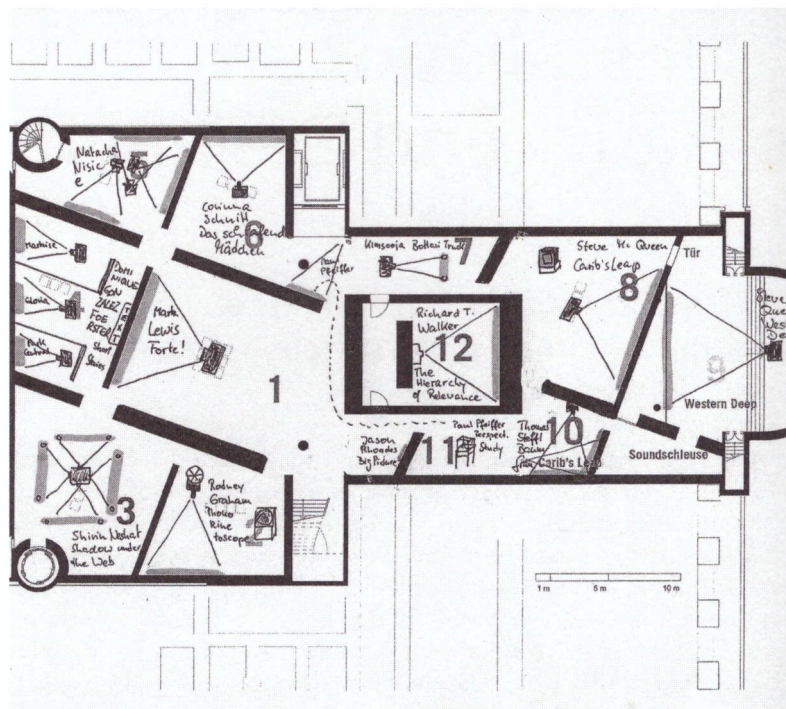


Figure 23: Doris Krystof, *Big Picture: Orte/Projektionen* (2011), Art Collection North Rhine-Westphalia, Dusseldorf, design sketch for the exhibition.

With the exception of a small cinema in the apse, the hermetic closure of black boxes was largely avoided through an irregular floor plan, dissolving clear limitations of spaces, passages conducted to the ceiling, and long visual axes. More or less open zones were created instead of closed rooms. The installation should guide the movements of the spectator through the exhibition but without defining one fixed path. Overlapping sound were considered acceptable. Together with the visual axis they should create meaning through juxtaposition. The sound in *Big Picture I* was staged in a way that it would guide the spectator through the exhibition. The small amount of exhibits should antagonize the fatiguing effect of media art. A small collection of exhibits can actually be more rewording than large ones. This paradigm is especially true for new media art, but applies also to other media. Neither is this a recent realization. Benjamin Ives Gilman states in his 1909 article *Aims and Principles of the Construction and Management of Museums of Fine Arts*: “A greater unity of impression is possible with fewer exhibits and the attention is fresher for them” (Gilman, 2012, p. 420). In addition, an alternation of places of high concentration and rest can avoid fatigue and keep the visitor fresh. Doris Krystof, curator of the exhibition states, the path of *Big Picture I* was build in a way that it naturally encouraged to observe and to move, to continue observing and moving (Krystof, 2014, p. 176). Zones strongly stimulating the observer and demanding high attention and concentration were altered with those of divagation and distraction. In this manner, the creators tried to avoid over-stimulation and exhaustion of the spectator.

For the exhibition of interactive media art variability in the museum space is important. Both concepts black box and white cube have advantages and disadvantages for the presentation of media art objects and it often has to be decided from case to case which mode

is the best suited for a successful exhibition. The space needs to be able to adapt to the varying needs of the artworks. For some works a more private atmosphere is favorable, others work better in an open space or in confrontation with other works. The museum needs to be able to provide those surroundings for an optimal appreciation of interactive media art. It does not only need to be scalable to the varying sizes, provide optimal sound conditions and so on, but the space has to be build in a way that encourages the kind of interaction intended by the artists. Overlapping zones and flexible path can anticipate the hermetic isolation of the black box and an alternation in situations of high stimulation and tranquillization, as well as a limited amount of exhibits may reduce the overpowering effect of interactive media art.

3.2.4 Computer-Cabinets and Online Exhibitions

Internet based art might be best experienced in a private atmosphere, as Benjamin Weil, curator for media art at the San Francisco Museum of Modern Art stated in an interview with Beryl Graham from the CRUMB network:

It's interesting; I was always under the assumption that computer screen based art should be experienced on the computer screen in an intimate sort of situation of your home, your office or wherever you have access to a computer or maybe in a cyber café but not in a museum. (Graham, 2002)

Media art festivals, like the *Ars Electronica* in Linz, often have internet galleries (called *Electro Lobby* at *Ars Electronica*) resembling the aesthetics of a cyber café rather than those of a museum space.



Figure 24: Centre Georges Pompidou, Paris, Space for New Media and Film, 4th floor.

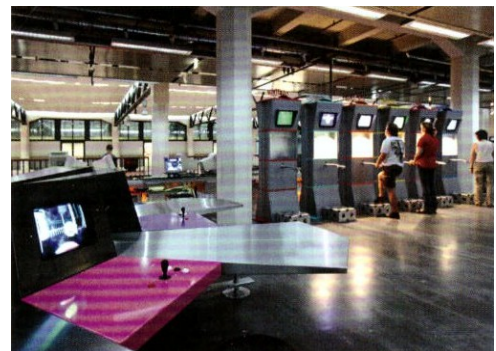


Figure 25: ZKM Medienmuseum, Karlsruhe, Welt der Spiele.

The Center Pompidou is one of the museums which are providing personal computers for the use of the visitors (fig.24). Here the visitors can browse the museum's video art archive containing over 1 200 artworks (Racine, Pacquement, Assche, Parfait, & Michaud, 2006, p. 286). In such cases, museums have to think very carefully about how to present the art on the computer. The database model as chosen by the Centre Pompidou might provide a useful tool for a researcher or an expert, who knows what he is looking for, but an unprepared visitor might find it difficult to orientate in the mass of little structured data.

The video game part of the permanent exhibition at the ZKM (fig.25) has a similar atmosphere. Much like in a cyber café or in amusement arcades, computers are strung in lines or grouped on octagonal desks. But instead of having access to the whole collection at each station, as it is the case at the Centre Pompidou, only one game can be accessed at one computer. The ZKM thus choose to limit the amount of exponents in favor for a conclusive path through the history of computer gaming as complement to the exhibition of interactive

media art.

Such computer spaces can be useful for the exhibition of computer and net media art. Museums have to choose between access to an extensive database, more suited for specialist users, or a conclusive course, more adequate for the unprepared visitor. Both are rather a supplement and can in no way replace the presence of interactive media art in the course of the exhibition. Much media art, analogue or digital, needs to be installed in order to develop its full effect. Video captures or photographs can often only give an incomplete impression of the works. Such computer spaces should not be used in order to avoid including media art into the exhibition. Separating new media art in such a manner would enforce the perception of being apart from the commerce of art.³⁶ This system physically separates new media from the visual art history unfolding in the museum halls.

Then again, the creation of media spaces or media launches, can encourage a museum to engage with media art on a regular basis. Once created, the museum might feel obligated to propose a conclusive programming for the space. The investment in a computer cabinet or new media space represents a long term commitment rather than an occasional presentation, which is furthermore independent from the personal commitment of a single curator who might leave the institution. Finally, the visitor might feel invited to spend more time and have a deeper contact with a work in the often intimate atmosphere of a computer cabinet than exposed in the gallery space.

Some museums also provide online spaces in order to present their net art collections.³⁷ The Walker Art Center in Minneapolis was the first to create an internet gallery, *Gallery 9*, in 1996. The museum commissioned a number of net art projects under the direction of Steve Dietz in his function as curator for new media art, a collection that was augmented by the acquisition of *äda web* in 1998. *Gallery 9* was shut down as Dietz left the Walker Art Center in 2003 but one can still access an archived version of the site via the Walker homepage ("Walker Art Center: Gallery 9," n.d.). The British Tate collects net projects since 2000 as part of their intermedia project. 14 works are posted on their page but not all of them are accessible online ("Tate: Intermedia Art Archive: Net Art by Date," n.d.). The San Francisco Museum of Modern Art followed in 2001 with *e-space*, created "to explore new forms of storytelling ... within the unique space of a personal computer," as it says on the homepage. *E-space* was merely conceived as a temporary project, online only for the year 2001 ("SFMOMA: e.space," n.d.). Finally, the Whitney Museum launched *Artport* as privileged space for its net art commissions ("Whitney Museum of American Art: Artport," n.d.).

The online galleries give a better visibility to web art. However, it has sometimes been criticized that museums use their web presence as safe place to prove their commitment to new media art, by continuing to exclude it from their physical galleries. The Tate, to name only one example, commissions web art but has no other interactive media art objects in its physical gallery. The fact that many net art projects only were temporary supports the assumption that museums still are not comfortable with the exhibition of interactive media art.

36 Christiane Paul uses the term ghettoization to put an emphasis on this separation of new media from other media (Paul, 2006, 2008b).

37 The creation of internet galleries and the aquisition of net art seems to have reached its intererim peak around the year 2000 and declines since.

When interested in net art or in interactive media art in general, independent sites like Rhizome.org or Media Art Net still offer a better information infrastructure and remain the reference for new media.

3.3 Documentation

The customary documentation of museums and collections is designed in order to help conserving the original appearance of static objects. For this purpose, works are regrouped in fixed categories of genres (painting/sculpture/video/etc.) and clear and static attributions in terms of author, title, date, medium, and dimensions. With 20th century avant-garde movements already blurred static characteristics by working outside the practices and media commonly accepted as art. Interactive media art enhances this effect by abandoning statically fixed objects in favor flexibility and variability.

This difficulty to document variable objects is especially visible in the writing of wall labels and catalog captions. The customary categories of the wall label, author, title, date, media, and dimensions are each challenged in their own regard. The explicit citation of materials and dimensions is already difficult for some modern and contemporary art practices, like installation, assemblage, or objet-trouvé, and open ended works like happening or performance. However, the art world is creative in finding new terms in order to categorize these objects when it becomes impossible to fit the new practices into the old categories.

The problem is amplified by new media. Not only do media art objects combine a long list of different materials, wires, screens, projectors, sensors, CD-Rom etc. but their creation also integrates a variety of different persons, artists, engineers, programmers, and even the spectator. How should one date an open ended artwork which is intrinsically unstable, always changing and open to editing and development, an artwork that may alter its appearance over time or adapt to the specific conditions of each exhibition site. The installations are often site specific and variable, what makes it difficult to attribute dimensions. Furthermore, cyberspace is often an integral part of media art objects, which may exist only in virtual space and cannot be measured in common units.

A work often undergoes aesthetic changes and developments; equipment and scale may adapted for the particular characteristics of each exhibition space, festival, or web page. New media art can only survive by multiplying and mutating, therefore standing in direct confrontation to the idea of fixed characteristics that can be expressed easily on a wall label or catalog caption.

3.3.1 Author

New media art challenges the idea of a single author, not only by assigning creative activity to the spectator (see chapter 2.4 Interactivity) but also by its distributed and networked character. Because of the complexity of the digital medium it is rare that one persons owns all the know how necessary for the creation of media objects. Therefore, new media artists often work in teams, collectives or with a number of independent collaborators.

The idea of the artist as single genius, working isolated and alone is inherited from a romantic frame of mind. Even though the artist studios and groups are no exception in the contemporary art practice, the collaboration of numerous people is the rule in new media. Jon Ippolito also argues that the kind of collaboration is also different in new media art. The collaborators would have a more important stance than a simple assistant in a studio (Ippolito,

2008).

While in the studio of an artist, the assistants generally have a rather executive role, the aesthetic decisions are still being made by the artist, and therefore being more or less interchangeable, the programmers and other collaborators of media art, also take aesthetic decisions and are therefore not mere participants but co-creators. Because of the role the different collaborators play for the aesthetic experience of the work, they should also be mentioned on the wall label and in credit captions.

Because of the difficulty to mention all participants on the wall label or in the literature, artists commonly adapt by forming artist groups with distinct group names. This method is so common in new media art that there are actually more artist groups than single artists. For example, in Christiane Paul's artist index *Digital Art* the letter 'e' consist of 'Electronic Café International', 'Electronic Disturbance Theater', 'Entropy8Zuper!', 'eteam', and 'etoy' (Paul, 2008a, p. 248), all of which are groups formed by several collaborators.

While artist groups are easily fit in the single artist category, they do not represent the complex relationships and interactions of the collaborators during the creative process. This strategy masks the different levels of cooperation in favor for a more conventional imagination of the work issuing from a single studio working within a single frame of mind. The multiple collaborations for a given work, which may be net-worked, multi-user, multi-geographic, and asynchronous become invisible.

Furthermore, the group names allude to a stable, unchanged group of people. In reality, the members of a group can change over time or include different people from project to project. These personal changes may have important implications in the aesthetic characteristics of the work but are not represented in the captions. For example, as etoy created *Digital Hijack*, an internet-agent that automatically infiltrated search engines and redirected the users, hijacking them in a manner of speaking, in 1996 Hans Bernhard was part of the group while, he had left, when *DAYCARE* was created in 2001 for the *Biennale Internazionale Arte Giovane* (2002). When artist groups are rather loose collaborations than stable groups of ever the same people it becomes important to list the collaborators for each project in order to maintain a trace of the participants. Simply naming a group often reveals itself as to simplistic.

Some attempts have been made in order to create documentation systems more suited for distributed creativity. *The Pool* (Bell et al., n.d.) launched by Jon Ippolito and Joline Blais at the University of Maine's Still Water Program is a web page assembling online art, code, and text from and for artists. Every collaborator, participant and user is invited to comment on and edit artworks and to mark their intervention. The Pool encourages and documents collaborations for the creation of media objects in a variety of forms. It is offering an extendable author function, a list of creators responsible for a media art object, a breakdown of the roles every participants played. This data is stored on the Pool server and can be selected, searched, and filtered by the user. While such a practice seems to be appropriate for websites, print versions quickly become cumbersome. Nonetheless, the caption of all parties involved in the creation of a media art object better reflects the creation process of new media art, since it records the contribution of all substantial collaborators.

3.3.2 Title

Jon Ippolito describes in his article *Death by Wall Label*, how the name of a project can

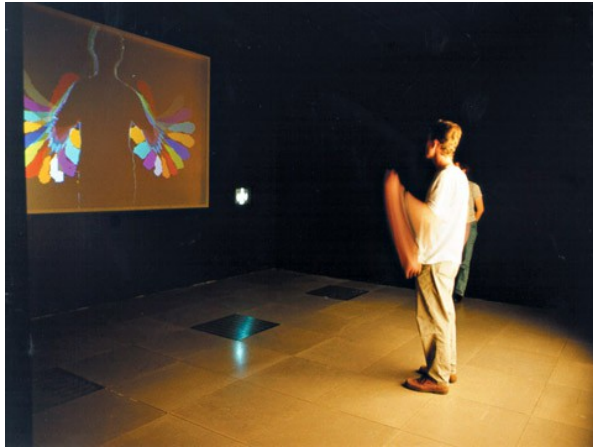


Figure 25: Myron Krueger, *Videoplace* (since 1976), interactive installation, dimensions vary with installation, installation view.

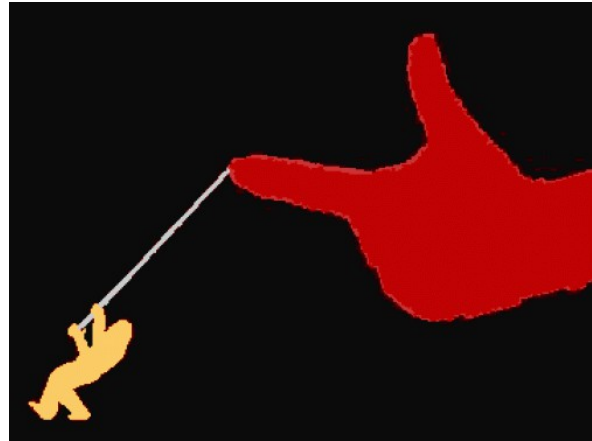


Figure 26: Myron Krueger, *Videoplace* (since 1976), interactive installation, dimensions vary with installation, script *leaning by a thread*, interactive installation for two persons, screenshot.

change during the process of its development or when different, updated or interpreted versions of one media object exist (Ippolito, 2008, pp. 112–113). As example Ippolito traces the evolution of Mozilla’s web browser whose newest version is named Firefox. The author explains how these changes of names can pose a problem, especially when multiple authors are implied in the production process. It can be imagined that an authors who cooperated at a project at the beginning and wants to join again at a later state may find it difficult to find the project when the name has changed. A frequent change of the title of a media object, common in the software community, seems less usual in the art world, at least after a media art object has been published. Nevertheless, although Ippolito does not mention any examples from the art world, it can easily be imagined that similar difficulties may appear also in the production process of media art objects. Therefore Ippolito proposes to note all intermediary names of one project. Thus the single title model would be abandoned in favor for a scheme including all temporary titles like ‘title (previous title)’ or ‘title, based on previous title’. Such a style can also takes the aesthetic changes into account, which sometimes occur during the conservation of a media art object.

It can also be asked weather it is appropriate to use the same title for developing objects which may differ from exhibition to exhibition or change over time. Someone who saw Myron Krueger’s *Videoplace* (fig.25; 26) when it was first exhibited at the Milwaukee Art Museum in 1975 would not have had the same experience as if it would have been seen at the *Siggraph Art Show* in 1985 or at the *Ars Electronica Festival* in Linz in 1999. When Krueger first exhibited *Videoplace* in 1975 two persons in distinct rooms of the museum could communicate by the means of their simultaneous visual representations which were projected on screens in each room. A computer was not yet used in this early version of *Videoplace*. Later Krueger used a computer and wrote programs experimenting with new forms of interaction. Today, *Videoplace* offers 25 scripts for 25 distinct interactions between visitor and program or between several visitors mediated by the program. Krueger is constantly upgrading *Videoplace* by adding new scripts or adapting the existing ones by upgrading the software and hardware, etc.

The single title caption does not take these constant changes and developments of programs and interfaces into account. It suggests a stable object remaining unchanged since

its creation. For works like *Videoplace* the single title caption is not precise enough in order to unmistakably distinguish, for example, a photographic representation or a work discussed in a paper. The adding of dates and places of the specific version of a work would provide remedial for such works which are site specific and changing from installation to installation. Such a caption could also include the name of the person who installed this specific version of the work if this has not been done by the artist. The adding of a number for the version, as it is common practice in the software industry, is an alternative which will be discussed in the following sub chapter.

3.3.3 Date

The dilemma of the single title for media art objects also relates to the single date. It seems unfitting to label works like *Videoplace* with the single year of their first release, regarding the profound changes that have been made to the work later – use of the computer, adding of scripts for interactions, set up for one or two persons, etc. Similarly it would be misleading to indicate only the date of release of the exhibited version, disregarding the history of the work. The problem is often resorted by adding 'since' to the date. This notion states the year of first release and hints at a development but it does not allow for a tractability of the kind and depth of the change.

As often in new media art, this problem is not entirely new and can be encountered already in currents of conceptual and performative art. For the exhibition of Sol LeWitt's *Wall Drawings* at the Centre Pompidou Metz in 2013 the minimal paintings were administered by Museum stuff and art students according to the precise instructions elaborated by the artist between 1968 and 2007. The works were thus painted in 2013 but their conceptions are older. The same applies to Felix Gonzalez-Torres' paper stacks and candy piles, which are reproduced for each exhibition according to instructions given by the artist. As misleading it is to date, for example, the candy pile *Untitled (Portrait of Ross in L.A.)* to 1991 when in fact the candy was produced yesterday, it is equally inaccurate to give only the date of the fabrication of the particular new variant.

A different approach is offered by open source collaborations and software companies. While art history is used to unique objects, whose creation can be traced back to a single moment in time, the software community operates with frequent product releases and updates. In order to keep track of the ever altering codes, software companies started to index their products by date (as it was costume for the Microsoft Office Programs) or by numbering the versions (as for Mozilla Firefox).

Examples for new media art objects with constant changing appearances can easily be found. In the following an alternative dating model will be tested on the work *Apartment* by Marek Walczak, Martin Wattenberg and Jonathan Feinberg. Since the *Apartment* software has first been lounged on February 12th 2001 on Turbulence.org numerous alterations have been made to the *Apartment* software and design, for example, in order to run more smoothly or to alter the appearance of cities and rooms. Physical interfaces were created by the artists at the occasion of exhibitions (see also 2.5 Immateriality). Even though the *Apartment* has changed substantially and continues to develop due to user contributions, a catalog entry or wall label of the traditional model would treat all versions identically: 'Marek Walczak, Martin Wattenberg and Jonathan Feinberg, *Apartment*, 2001'.

The numbering of different versions, an approach borrowed from the software industry

can provide remedy. The RAND computer scientist and consultant for the Variable Media Network Jeff Rothenberg suggests a protocol for keeping a trace of the development of an artwork by adding versions to the title. The first version of *Apartment* launched in February 2001 then would be described as 'variant 1.1'. Already in the first two weeks after the public release the software was slightly altered eight times. Those minor changes could be expressed in the consecutive sequence of the second number (v.1.1, v.1.2, v.1.3, ...). The first major adaption had to be made for the exhibition of *Apartment* in 2001 at *Data Dynamics* at the Whitney Museum. A physical interface was created in order to allow the visitors to interact with the program (fig.15). Such a significant change would result in the alteration of the first number: variant 2.1. A year later, from February 28th to March 30th 2002, the same interface was reinstalled in the MU artspace in Eindhoven (v.2.2). The next significant alteration was the creation of a multi-user interface, allowing the interaction between two spectators, which was created on the occasion of the exhibition at *Ars Electronica* in Linz 2001. Accordingly this would be variant 3.1. etc.

The numbering of the different versions allows to trace the changes made by the artists and programmers. However, unlike software developments, where the newer version makes the previous one obsolete, the three main variants of the *Apartment* software and interface stand parallel to each other and have their own aesthetic characteristics.³⁸ While this model takes the changes made by the artists into account, it does not allow to keep track of the numerous additions made by the public. Database-driven projects can vary from day to day or even from hour to hour. The *Apartment* launched by the artists in 2001 is no longer the same like today, even if no alterations to the code would have been administered by the artists themselves. Therefore it is important for screen shots or video captures of the artworks to be dated as well. Furthermore, it might be difficult to number the versions indisputably in retrospective, because the definition of major and minor change can be subjective and change from spectator to spectator.

3.3.4 Media

The attempt to describe new media with classical, medium specific terms, as a list of the implied materials like 'oil on canvas', 'bronze' or 'copperplate engraving' results quickly in a very long and incomprehensible list.³⁹ The common simplification 'multimedia' does not help much either because it is so broadly defined that it becomes non-declarative. Furthermore, multimedia is often also used in order to describe artworks, which are more traditional in terms of the use of technology.

The Variable Media Network, founded by a number of mostly American Museums for contemporary art and the online new media art platform *Rhizome.org*, designed a questionnaire for artists working with ephemeral materials in order to allow for optimal exhibition conditions and the appropriate conservation of the works. First, the Variable Media Task Force tried to work within the art-historical, media-specific categories, such as 'photography', 'video', and 'film'. Several problems were encountered with these medium

38 In order to underline the difference between media art object, where the different variant have exist on their own right to be, and the software industry, where each version becomes obsolete with the creation of a newer one, Rothenberg prefers the term variant to version.

39 For example: Name June Paik, *TV Garden*, 1974, nineteen 36-inch SONY video monitors, fifteen 21-inch SONY video monitors, and twelve 5-inch Magnavox video monitors, five pairs of speakers, DVD player, three video distribution amplifiers, cable, DVD, wood, soil, and 187 live potted plants of various types.

specific descriptions. As soon as a medium becomes obsolete, so would the medium specific description of the work. In addition, a work can often be migrated from one medium to another. For example a video can be stored on VHS, DVD, CD-Rom or on a computer hard drive, etc. Finally, one medium can be expressed or simulated by the means of another, a phenomenon called post-medium condition describing the interchangeability of media.

Furthermore, as soon as a new medium appears, a new category would have to be added to the list. The Variable Media Network therefore encourages artists to describe their work in a medium-independent manner. The network developed new categories in order to describe ephemeral, multimedia works which are not based on their medium, but on their behavior. The 'behaviors' focus on the aesthetic experience of the work rather than on exactitude of employed materials. The Variable Media Network further asks for specific instructions from the artists concerning the interchangeability of the medium, for example can a video-disk be digitized, or a screening technology be replaced by a newer one.

It quickly becomes clear that works executed in very different media may share similar behaviors. Therefore the categories elaborated by the Variable Media Network apply not only



Figure 27: Mark Webster, *Stick Spiral* (1986), branches, dimensions vary with installation, Solomon R. Guggenheim Museum, New York, installation view, Guggenheim Museum SoHo, New York, *The Material Imagination*, November 18, 1995–January 28, 1996.

to the technologically driven media, but also to a multitude of other ephemeral works. A work is for example 'installed' when it requires a complex physical installation. For instance works, which can be adapted in scale in order to fit a given venue or which require unusual placements. The questionnaire then asks for preferences such as ideal placement, lightning requirements, and distribution of elements.

Other works are 'performed'. This category does not only apply to performative works, requiring a theatrical or musical setting, but also to all such works where the re-

creators have to perform a specific action in a new context according to artist instructions. It thus includes all such works for which the creative process is valued over the product of the action. Sol LeWitt's *Wall Drawings* would fall under this category as well as Robert Morris' performance *Site* (1964). Some artworks can be performed and installed, such as Meg Webster's *Stick Spiral* (1986, fig.27). Webster requires the wooden branches of the spiral to be collected by the museum staff. Furthermore he specifies for the sticks to be cut from the trees and bushes for a reason other than the exhibition. This performed action classifies the work in the category 'performed' in addition to being 'installed'.

'Reproduced' are all artworks whose medium loses quality by copying. Such media include analogue photography, video and film. In contrast, a work is 'interchangeable' (or 'duplicable') when it can be copied without losing information. Such works do not necessarily

need to be digital. Some analogue artworks, like the previously discussed work *Untitled (Portrait of Ross in L.A.)* by Felix Gonzalez-Torres (1991), can also be duplicated. A museum could decide to produce twice the amount of candy needed for the work and display two identical copies of the work, or it could be exhibited at several locations at the same time. Mark Napier's *Net Flag* (2002) would be a prominent example for a digital artwork that can be duplicated. For such works it must be recorded whether the artist allows for several clones of the work to be exhibited on different locations at the same time and how these different clones should interact with each other.

Both works, *Untitled (Portrait of Ross in L.A.)* and *Net Flag* are also 'interactive' in the sense that museum visitors are able to change the work, to add to it or to take something from it. Visitors can take candy from Gonzalez-Torres's candy pile or edit flags with Napier's software application, which will then be stored in a database. It also has to be asked whether such interactive work should be conserved and exhibited in its original state or if the alterations made during previous exhibitions should be conserved as well. While in the case of Felix Gonzalez-Torres the candy piles and paper stacks are reset to their original state for each exhibition, many interactive media artworks evolve constantly through user interaction and are never set back to their state of first release.

Napier's *Net Flag* is also 'encoded'. A work is called encoded when it uses some kind of code, such as a computer language or some other language that requires interpretation (such as musical notation or dance notation). For 'encoded' digital works, it has to be determined whether alterations to the code can be administrate d in order to preserve the work. Finally, a work can also be 'networked'; This is when its creation or distribution implements some kind of network, such as the World Wide Web, or a Local Area Network. This category can included websites, e-mail, and streaming audio and video.

The Variable Media Network pleads for the replacement of media specific descriptions with these behavioral categories, not only in the museum archives, but also on wall labels and catalog captions. The media independent approach gives the vocabulary for writing a short, medium line, without relying on the insignificant 'multimedia'. Instead of adding up all the variable materials inserted in one artwork, the media independent description focuses on the aesthetic qualities of a work and describes how it behaves and functions. The 'behaviors' also have the advantage to apply to digital and analogue media simultaneously. The distinction between analogue and digital media is somewhat obsolete, since analogue media can be expressed in the digital one. For much video art or film the analogue original is stored safely in some archive while a digital copy is on display in a gallery. Whereas the traditional approach would demand to exemplify that a digital copy of an e.g. 8 inch video tape is on display and also cite the used screening hardware, what will not only result in a relatively long list, but also insignificant regarding the specific aesthetic characteristics of the work. The media independent approach, on the other hand, enables for a short, but significant description of the inherent characteristics of the work.

3.3.5 Dimensions

Much contemporary art already challenges the notion of the fixed dimension of an artwork. Works, whose dimensions vary from exhibition to exhibition, like Webster's *Stick Spiral*, or whose dimensions can change during the exhibition period, like Gonzalez-Torres *Untitled (Portrait of Ross in L.A.)*, are no longer exceptional in the art world. The first

conference on variable media *Preserving the Immaterial*, which took place at the Solomon R. Guggenheim Museum in March 2002 has dealt with the difficulties of noting dimensions for installed, often site specific works. The conference found the term 'dimensions vary with installation' for works like *Stick Spiral* whose dimensions depend on the exhibition context but are fixed otherwise and 'dimensions variable' for those whose size may change during the exhibition period ("Preserving the Immaterial: Conference Transcript," 2001).

The capture of exact measurements of height, width and depth may suggest that the work is meant to be re-installed in those exact measurements, even though this might be unachievable and does not necessarily correspond to the artist's intention. However, to simply note that the dimensions 'vary with installation' or are 'variable' is not sufficient because it gives no information about the size of the work. Another, and more suited alternative, would be to note both, the variability of the dimensions as well as the size of the work in a specific exhibition context, at least approximately. The caption could look something like this: dimensions vary with installation, here X x Y x Z cm.

The two terms elaborated during the *Preserving the Immaterial* conference seem to be well suited for those analogue installations with unfixed dimensions. However, the subject becomes somewhat more complex when digital space is involved. For works like *Net Flag* the dimensions depend solely on the physical interfaced used. When the site is accessed from a computer, the work scales automatically to the size of the computer screen. It may be more or less suitable for a screen of a certain size, but it has no dimensions per se. In works using virtual reality, the visitor can explore a digitally constructed space, which may enlarge and change continuously and cannot be measured in conventional units. No overall excepted convention does yet exist for such works. Literature and curators therefor tend to leave the dimension line out of the caption.

3.3.6 Documentation of Multiple Narratives

The previous subchapters focused on typical terms which are used in order to describe and classify art. It has been argued, that the fixity of these categories deny the variability of new media art and need to be adapted in order to be able to describe this artform adequately. However, even if these categories were adapted consequently the museum documentation would still be a narration of one single voice, the official voice of the museum to which sometimes the voice of the artist, recorded by the museum is added. However, one could easily argue that the official art canon is neither infallible nor is it the only possible angle which can be used to consider the art works.

For works in ephemeral media, not only new media art, but all art works that have to be installed or recreated for each exhibition, documentation plays an important role, because it is the basis for the re-installation or re-creation. Museum curators use notes and descriptions left by previous curators and other museum stuff as well as records left by the artist and interviews with the artists for this. The variable media questionnaire, developed by the Variable Media Network already mentioned before was designed in order to record the artists' intent for the future uses of their works. It asks questions like should the overall dimensions of the work remain fixed in future re-creations, regardless of the new exhibition context, or can the materials of the work be substituted when the original materials are no longer available, etc. and thus leaves guidelines for future re-creations, re-installations, or re-performances.

Documenting the artists intent for his work is not only important for future recreations

of the work, but it can in some cases even ensure its survival, at least in the short run. One famous example are Eva Hesse's latex sculptures like *Expanded Expansion*. The experimental material Hesse used in order to create her avant-gardistic work turned out to be very ephemeral. The flexible and extendible skin of *Expanded Expansion* began to deteriorate and decompose and now is locked away in the climate controlled vault of the Guggenheim Museum. In spite of all the museum conservators' efforts, "all that may be left of these remnants of sculptural splendor one day is dust in an archival box" (Rinehart & Ippolito, 2014, p. 4).

Today, Eva Hesse is dead and we no longer have the possibility to ask her what kind of future she intended for her works, but it is not difficult to imagine that it would not have been for them to rot in a box; locked away from all public access. If the momentariness of the material would have been recognized earlier, Hesse would have had the possibility to leave instructions for the future use of the work and maybe, she would have wanted her work to be recreated in order to ensure their longevity, or maybe she would have wanted them to be exhibited in spite of their deteriorated state. Maybe, she would have wanted her work to be only for the moment and then die, what can also be a valid option. For *Expanded Expansion* it is now too late to find out what Hesse would have wanted for its future, but there is yet hope for many other works which might one day end up in a similar storage box in some museum vault.

Documenting the artist's intent is an important step for the preservation and the re-installation of interactive media art, however, it has major disadvantages. As Tiziana Caianiello points out, "die Intention des Künstlers kann jedoch dadurch nur bedingt rekonstruiert und festgehalten werden, unter anderem, weil sie in ständigem Wandel ist." Furthermore, she claims that the museum uses the tool of the artist interview to give the responsibility for the future of the work to the artist (Buschmann & Caianiello, 2013). But, isn't the museum rather taking responsibility by trying to find out what the artist would have wanted for his work and thus having better grounds for the preservation of the work? However, documenting the artist's intent can always only be one out of several tools, since, as Duchamp states in *The Creative Act*, the intent of the artist is not necessarily identical to the artwork. Indeed, the intention of the work, can be different from the one of the artist and it is this *intentio operis* (term coined by Umberto Eco) that has to be identified and preserved.

In their book on the preservation of interactive media art *Re-Collection* Jon Ippolito and Rick Rinehart oppose formal social memory, the canonical records of the art world, to informal social memory, which is characterized by distributed forms of remembering (Rinehart & Ippolito, 2014, pp. 98–100). The tools developed by museums are very useful for the documentation of the exact look of a work of art, the exact color of a pigment or the exact size, however, it has almost no tools for the documentation of the way a work of art behaves or feels like. For works in variable media however, the focus on the exact look of a work in opposition to the way a work feels like or is experienced, the replacement of memory through documents can lead to the misinterpretation of the work. The formal social memory offered by museum documentation can always represent only one angle of the work, but not the work as a whole. Multiple narratives, like the memories of the artist's partner or assistant, of the gallery owner who represents him or the spectator who saw it at the opening of the first

exhibition might improve the vision of the work. The recording of multiple narratives could propose a vision of the work from multiple angles and thus help preserving its original aesthetics. Digital media offer the possibility to easily record and treat multiple parallel memoirs of one work, for example spectators can add notes on the museum's internet site, which can be stored, classified, searched and shared with digital media. Thus museums can record a multitude of samples, which overlap at many points and together provide a more complete image is the original state of the work for its re-creation.

3.4 Preservation

The digital medium has to adapt continuously to the pace of technological development in order to subsist. The large scale commercialization of personal computers and the World Wide Web revolutionized the concepts of documenting and recording of information, yet the digital medium is more fragile than most would assume, even more fragile than paper. The idea that something that has been published on the internet will remain forever is an urban myth. While it might be difficult to deliberately remove information from the world wide web, it is just as challenging to recreate homepages that have gone offline or to run a piece of obsolete soft.

The expected physical lifespan of new storage media is surprisingly short: between 5 and 59 years for optical media like CD, DVD and CD-Rom, 2-30 years for digital tape and only 5-10 years for magnetic tape. The pace of technological development of these storage media is even more threatening to its longevity. It takes only 5 years until each of these media is rendered obsolete by a newer, updated technology (Rothenberg, 1999, p. 3). The average life span of a web page is even shorter, only 74 days in 2002 (Dietz, 2005, p. 94).⁴⁰

Furthermore, if the storage medium is still intact and one has a suited hardware device to read the medium, one would also need a program to interpret the bit stream, the sequence of digits. "Old bitstreams never die – they only become unreadable" Jeff Rothenberg stated in his 1999 paper *Ensuring the Longevity of Digital Information* (Rothenberg, 1999, p. 2), and he continues; "it [would be] naive to believe that any document encoding – however natural it seems to us today – will continue to be readable by future software for very long" (Rothenberg, 1999, p. 10).

The software necessary to run a given application may change every couple of month and is not always backwards compatible.⁴¹ A bit stream may only be readable by the software that created it. When this software becomes obsolete, so becomes the information it encoded. Also, original software does not necessarily run on new computers. This phenomenon is

40 To estimate the average life-span of a web page is complicated and presumes that one knows what it means that a web page has died, what in turn depends on whether it is defined by its URL or by its content. The content of a non-resolving link may remain accessible under a different URL or the content of a URL may change. Furthermore, the lifespan of web pages is very variably. While some may last for years, others are online only for days or even hours (see also Ashenfelder, 2011).

41 To give an example: A couple of month ago, I still could access Mark Napier's *Net Flag*, on the Guggenheim homepage. Today I am no longer able to access the artwork. My computer now uses an updated version of Java script which is not backwards compatible with its predecessor. The source code of *Net Flag* does no longer fulfill the conditions to be read by Java. A number of other artworks are also effected. Among them *P-Soup* by the same artist, Andy Deck's *Open Studio*, *Apartment* by Martin Wattenberg and Marek Walczak and *Jackpot* by Maciej Wisniewski. Without some kind of intervention the media art objects will remain unreadable and eventually disappear entirely.

referred to as software-dependency of digital code.

While a printed document remains readable for years or centuries without requiring any special machinery, tools, or knowledge other than language skills to decipher it, the digital document, as well as some analogue documents like VHS or Videodisks, are unreadable without the appropriate technology. An entire suite of hardware and software is necessary in order for digital data to be expressed by a visual interface.

The preservation of new media art requires to take actions as early as possible in order to preserve the artist's intent. The questionnaire of the Variable Media Network tries to obtain the artist's intentions for the preservation of a work of art: Can it be migrated in a different format? Is the screen resolution important? Is the museum allowed to recreate the work if necessary?

There are some examples of maintenance contracts between museums and artists. Thus the artists become directly responsible for the continuity of his work. While the artist may have the most profound knowledge of the artistic intent that drove him to the creation of the work, he might be tempted to change crucial characteristics of the work in retrospective. Artist personalities evolve and might not always be satisfied with previous works. New media art collectors will have to decide how much control they want to give the artists over the works in their collections. Anyhow, artists will not be able to maintain their work indefinitely and sooner or later, a different solution has to be found. Therefore it remains indispensable to document the artists' intent as early as possible.

The loss of new media art that has already taken place is difficult to estimate. Funds for preservation are only being raised for works that are esteemed to have cultural value, whereas the historical significance of a work may reveal itself only years or decades later, when the source code might be unreadable or lost already. The short live span of media objects makes it all the more important to conduct an early and structured intervention of some kind, which is challenging for museums because the necessary knowledge and techniques are different to those used for the conservation and restoration of art objects in traditional media.

The following chapter investigates the advantages and opportunities as well as the weaknesses of the different preservation strategies developed for new media art. However, museums will have to get used to the possibility that the look of new media artworks might change over time. New media artists see this variability or adaptability of the medium rather as quality than as a weakness. In fact, variability and change are inherent characteristics of interactive media art. Katja Kwastek points out that

interactive artworks often do not manifest themselves in self-contained, material form, but as structures or systems. They may have been produced in different versions and have a large number of (sometimes variable) components, or they may run on different media. Above all, however, they are consciously conceived with a view to being realized by recipients in a multitude of ways. (Kwastek, 2013, p. 89)

Traditional art conservation however, aims at the material fixity of artworks and therefore is little equipped for dealing with the mutable character of interactive media art. When interactive media art is fixed, it dies. It is its variability that keeps it alive, Jon Ippolito further argues in this regard (Rinehart & Ippolito, 2014, p. 156).

In 2004 a team of curators, conservators and technicians of the Solomon R. Guggenheim Museum tried to imagine how media artworks might look like in the future. The Solomon R. Guggenheim Museum selected seven media artworks (Cory Arcangel/BEIGE, *I*



Figure 28: John F. Simon Jr.: (from left) *Color Panel VI.0.I* (2004), software, altered Apple PowerBook G3 laptop and acrylic, re-creation by the artist; *Color Panel VI.0* (1999), software, altered Apple PowerBook 280c laptop and acrylic, collection of the artist. Installation view, Solomon R. Guggenheim Museum, New York, *Seeing Double*, 2004.



Figure 29: Grahame Weinbern & Roberta Friedman, *The Erl King* (1982-85). On the left: 2004 version, Sony desktop computer, Linux operating system, CRT viewing monitor, LCD touch screen monitor, Elo touch screen. On the right: 1982-85 version, SMC-70 computer, CP/M operating system, custom build video switcher, three laser disc players, Carroll touch screen, one CRT viewing monitor, one CRT touch screen monitor, three laser discs. Installation view, Solomon R. Guggenheim Museum, New York, *Seeing Double*, 2004.

Shot Andy Warhol 2003; Mary Flanagan, [page], 1998; Jodi.org, *All Wrong Reserved* ©1982,2004/*JET SET WILLY Variations*, 2002; Robert Morris, *Site*, 1964; Nam June Paik, *TV Crown*, 1965; John F. Simon, *Color Panel VI.O*, 1999; Grahame Weinbern and Roberta Friedman, *The Erl King*, 1982-85) and elaborated variants with contemporary technology in collaboration with the artists. The results were exhibited in *Seeing Double: Emulation in Theory and Practice* (2004, fig.28; 29). Each of the works was presented in its original form with one or two emulated ones. The visitor could get a feeling for what it means for a work to be variable, and how such works might evolve in the future.

3.4.1 Storage

Because of the software and hardware dependency of digital code, the fact that digital code may only be represented by the software and hardware that created it, some collections containing new media art started also collecting the equivalent equipment. This approach enables the museum to replace defective devices and still preserve the original appearance of the work. This method is not only used for digital media, but also for some analogue works. For example, museums owning Dan Flavin's fluorescent light installations may buy a stock of the original light bulbs, before the company producing them goes out of business.

This procedure requires not only the storage of the digital files and the software that created them, but also the operating systems that allow the program to run. Luckily, museums are not standing alone with this problem. Archives of public-domain software are already proliferating on the internet and commercial programs may be added, when their copyright restrictions expire (Rothenberg, 1999, p. 14). Those program archives allow the access to historical documents given one possesses the necessary hardware to run the software.

The main disadvantage of this method, besides the costs for acquisition and storage, is that eventually the stock will run out or the materials will expire and the artwork will become

inoperative despite the measures taken for its preservation. Even if a given hardware is not in use, it will be inoperative eventually. Computer chips do not have an unlimited lifespan. Metal migration and dopant diffusion attack the chip, causing its failure. Even with unlimited, carefully stored equipment the approach is condemned to fail at some point. Nevertheless, storage can be a valid interim approach for the preservation of new media art, at least for a limited period of time. It is also the only approach that allows for the preservation of the exact appearance and function of the original code, thus being closest to the traditional goal for the preservation of an artwork.

Authors putting an emphasis on the importance of the aesthetics of the used technologies, also emphasize the importance of storage for the preservation of the work. Tiziana Caianiello, for example, who points out that the used storage and screening media influence the aesthetics of a work, states that the migration of the presentation technology may only be used, when the restoration or replacement with original material no longer is possible (Buschmann & Caianiello, 2013, p. 43). That means, that a video tape might only be digitized, when the very last VCR player in the work is out of order, what might have a negative impact on the other preservation methods that can be used.

The use of original technology might even change the premisses of the perception of the work. This is the case especially, when the artist used of the shelf technology, which was common at the time and thus little visible. The use of outmoded technology, even if it was the one originally used, might rise the recipients curiosity for the technology itself rather than for the subject matter of the artwork and shift the aesthetic experience. For example *Rider Spoke* from the artist group Blast Theory is using off the shelf tablet computers in order to record and play back the recipients comments. Because the hardware and software are common, their use is intuitive for most recipients. However, in 20 or maybe 50 years, the technology might no longer be known and its use might have to be explained in more detail. Thus, the conservation of the original hardware might not be in the best interest of the work and favors its original appearance over original use. This decision cannot be generalized, but has to be made for each work individually.

3.4.2 Migration

When a given storage medium or software application becomes obsolete, the media object can be migrated to a fresh medium. This requires the coping of the information onto new forms of media before the original storage medium became unreadable. The work is migrated to an upgraded equipment and source material. Migration is an ongoing effort that has to keep up with the technological development. The object has to be migrated continuously, before the respective medium expires. A single break in this chain can render the object inaccessible for future users. At the given pace of technological development and the subsequent momentariness of new media, and because of their short physical lifetime, new media objects have to be migrated every couple of years whereas each migration consists in a personal and financial investment.

In addition to being time consuming, each migration bears the risk that the code might not be expressed in the same manner as it used to be in the former medium. Similarly to the translation of a text, each migration has a unique set of problems. The migration of digital information is comparable to the translation of a text into a different language. Much like each translation, each migration causes the loss of information making it impossible to reconstruct

the original appearance of a work from its migrated version. Therefore migrations have to be carried out with extreme care and information about the process has to be recorded in sufficient detail in order to allow a later reconstruction of the original code. The process can thus not be generalized and is relatively labor-intensive.

Regarding the difficulties encountered with migration, Steve Dietz, former curator for new media art at the Walter Art Center in Minneapolis, regretted that he had not simply printed out all the software instructions and the artist's codes from the media art objects the Walker Art Center had collected (Dietz, 2005, pp. 97–98). In contrary to new storage technologies, it is very well known how to preserve paper. Printed out documentation can therefore provide future restorer or re-creators with further information about the art object and thus supplies an extra layer of safety.

3.4.3 Emulation

The emulation approach focuses rather on the preservation of the process of meaning-production than on the sole focus on material originality. Its starting point is the assumption that “too much reverence on the original (...) may destroy the original spirit of the work and undermine it as a functional artifact” (C. Jones & Stringari, 2008, p. 221). For analogue artworks, emulation means imitating the look of a work by completely different means (see e.g. “Variable Media Network,” n.d.). For Dan Flavin's light installations, for example, it would consist in the replacement of broken factory-build light bulbs with custom-build, manufactured ones, which are producing the exact same intensity and color of light and have the same physical appearance of the originals. Even though, in this case, emulation does not change the look of the work, it conflicts with the artist's intention. Flavin choose deliberately to use cheap, off-the-shelf light bulbs for his installations. The production of expensive customized materials was not intended by the artist.

Emulation can be a valid alternative to migration for new media art. While migration consists in upgrading the code to a newer software version, emulation mimics the behavior of obsolete hardware and software in order to allow for the original program to run on contemporary hardware. Since emulation does not change the original code, it should be possible to recreate the original document's behavior and form in as much detail as needed.

But in how much detail the original state should be restored? The code of Grahame Weinbren's and Roberta Friedman's *The Erl King* (1982-85) contained errors that could shut the system down. When the Guggenheim emulated the work for their 2004 exhibition *Seeing Double* they choose not to reconstruct this defect. The new technology also allowed for much quicker feedback responses. However, Weinbren felt that the speed of the digital version degraded the experience of the work. Hence, the original speed of the feedback responses was recreated for the emulated version (C. Jones & Stringari, 2008, p. 225).

In order for the emulation approach to work, it is not enough to simply save the source code. An entire suite of software may be needed for a source code to be read correctly. All the necessary software applications have to be saved alongside the file or program (bundled), or at least be indicated. Furthermore, the encapsulation of all this information has to be upgraded on current storage devices in order to be connected with the future hardware whereas the copying of digital code is also a common source for corruption.

The emulation approach has some irrefutable advantages. The emulation of a given hardware should allow for all software applications using this specific platform to run

correctly. Therefore it is less labor-intensive than migration. Emulators, once elaborated, can be shared among different museums and other institutions, like libraries and archives, or even private companies, facing similar problems for the preservation of their digital documents. Furthermore, it can be tested easily and is therefore little error driven and emulators can be nested in one another. Rothenberg demonstrates this by running a Windows based emulator for the 1949 EDSAC, a forerunner of the modern computer, inside a 2005 Macintosh emulator VirtualPC. Moreover, the necessary knowledge for the approach to work, the bundling of documents with the necessary software to read it and the recreation of the behavior of obsolete software and hardware is already in use.⁴²

3.4.4 Recreation

If the original work has become obsolete or does no longer function correctly for any other reason, recreation can be a valid method for the conservation of the work. While it may seem strange on the first sight to recreate an artwork – who would recreate a lost Rembrandt or Michelangelo on the basis of a description – recreation is actually already common practice in the cultural world. Music pieces, ballet, or opera spectacles are recreated by contemporary performers based on historical records, instructions, and documentation. When a museum wants to show a historical performance or happening, it may recreate it with reliance on the artist's notes and documentation. Also, artworks including ephemeral materials are regularly recreated in the purpose of an exhibition (e.g. Felix Gonzalez-Torres candy piles).

For new media art, the source code of a given media art object can be recreated in order to run correctly on contemporary hard- and software. Recreation can be an option notably for works which are freely accessible on the internet. *404* by the artist duo Jodi.org (fig.30; 31), Joan Heemskerk and Dirk Paesmans, deconstructing the internet's conventions for content organization, design, and coding, is an online message board playing with the error message '404 page not found'. When the URL is opened, the user is first confronted with a monochromatic screen, the color changes each time the page is opened, with the number 404 written in white letters on a black rectangle in the upper left corner (fig.30) and a quickly blinking cursor in the lower left corner. When the user clicks on the '404' icon or hits enter another page opens, displaying an arrangement of letters, numbers and signs, vaguely resembling a source code. The characters originally blinked but this behavior is not expressed by current web browsers, even though the code remains unchanged. The recreation of the work would consist in changing the original code so that the original behavior is expressed by contemporary web browsers. Then an internet user could perceive the work as it was meant to be, but without having to download a special software, as it would be necessary for example for the emulation approach.

Given that interpretation is always a part of the recreation of any given object, the action has to be carried out with intense care. To allow an authentic recreation, an exhaustive documentation of the work is indispensable. Also, it is important for the work to be presented not as the original, but as a recreated version of it. Since recreation is always also a creative process and because of its interpretive faculty it is important that the re-creator is credited in catalog captions and on the wall label.

⁴² For example compressed zip files are sometimes bundled with the necessary software to unzip it. Emulation is used by the software industry in order to test new software applications and to allow upwards compatibility for new hardware devices.

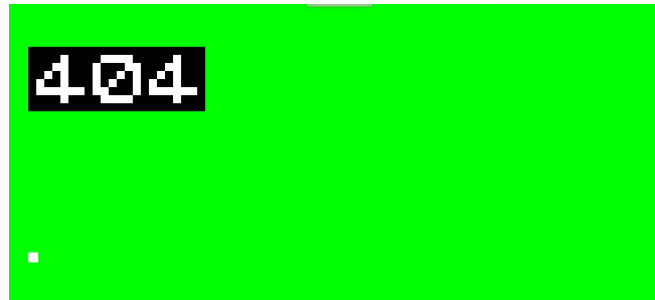


Figure 30: Jodi.org, 404 (1998), interactive software, Screenshot.



Figure 31: Jodi.org, 404 (1998), interactive software, screenshot.

Nonetheless, recreation, especially when it is done before the original work became unreadable, can be a necessary last resort for the preservation of media art objects. But in order to preserve the artist's intentionality it is highly important to obtain detailed information from the artist and to interrogate the artist regarding the possibility of the recreation of his work.

3.4.5 A mix of Multiple Approaches

There is not one approach that can be applied to the preservation of all new media art. Attempts to demonstrate future preservation possibilities of new media art, as it was done for the *Seeing Double* exhibition at the Guggenheim Museum, have shown that each work comes with its own set of challenges and needs a customized plan for its preservation that might mix different methods. Some original hardware might be stored as long as possible if it is important for the aesthetics of the work, while the code might run on an emulator on a new computer, and other parts of the work could be re-created for a different space.

Museums can mix and experiment with different approaches in order to ensure the longevity of new media art. Unlike for other artworks, new media art can be copied without changing the original. When the oil coating is scratched of a painting in order to be renewed, the original material is irrevocably altered. In opposition, new variants can be created for new media art without changing the primary one. Thus museums can test different preservation methods and compare the results to the original work.

Museums should further share their results with a wide community in order to obtain different opinions on them. Therefore they might want to give the public access to their documentation as well as to the code of the works. The open source community made very

good experiences with the collective preservation of cultural objects. Jon Ippolito describes how the fan community preserved vintage video games and keep digital code functioning, even though the original hardware has long been obsolete (Rinehart & Ippolito, 2014, pp. 117–120). Amateur programmers and hackers created emulators for video games, like *Super Mario Brothers*. Since the source code for the emulators are generally published online and freely accessible on the internet, programmers can take up the work of others and improve it. This public access to the source code also makes it easier to nest emulators into each other, thus facilitating future access to the works in the future. Ippolito further states that the quantity and quality of the emulators is astonishing considering that they were created by amateur programmers with no funding (Rinehart & Ippolito, 2014, p. 119). There are over a hundred functional Nintendo Entertainment System emulators for different platforms.

Is it possible to conclude from the successful preservation of vintage video games that the museum is no longer needed in its role of the preserver of cultural heritage? I would argue that no, because the premisses for the selection of the works to be preserved are different. The video game fan community preserved the objects which were the most popular, the institutional museum should preserve those which are the most relevant to the cultural heritage.⁴³ Nonetheless, the institutional museum can learn some things from the open source community. Video games and media art share some common characteristics, like being time-based, interactive, or process based, and digital. The goal of the preservation should always be access and the functionality of the work and not original materiality, to preserve the intent of the work and not the form. While museum preservation sometimes results in rendering objects inaccessible, the vintage video games can be accessed freely by everyone with a computer and an internet connection. Museums could also share the works and their documentation openly. Thus, a multitude of institutions and amateurs could work out a variety of new variants and the institutions then could choose the most successful ones.

The vintage video game example has also shown that copyrights and uniqueness can limit the survival of the works. The video game industry tried to prevent amateur programmers from sharing CD Rom's and the code for the games. Thus, museums have to create a legal ground for the use and the sharing of artworks for the purpose of its preservation or the creation of other artworks, as long as the artists agree with it. Finally, the different variants have to be tested against the public. This means that they have to be exhibited and accessible as much as possible. In order for the preservation of new media art to be most effective, museums have to overthink their standards of uniqueness, originality, and material fixity and rather think in terms of access and variability.

3.5 Mediation

Since the creation of the modern museum the mediation of cultural values was one of its main functions and purposes. For the first time, looting and treasures were arranged in the goal to mediate a message. Museums thus played a major role in the creation and perception of art history. The modern museum should serve the common men and women for the interest

⁴³ Some critiques also might want to argue that the museum, as well, preserves the most popular specimens of cultural heritage. The often criticized exclusion of new media art in the museum could further be used as an example for this. But still, there is a big difference between the kind of culture that the art museum collects and the popular culture that can hope to be conserved by the disorganized fan community.

of public education as part of the new democratic ideals. It was believed the conveyance of culture would contribute to the community's social welfare (e.g. Hooper-Greenhill, 2012, p. 559). A number of institutions for public education were founded alongside the art museum. Today, even though the goals of mediation may have changed, nearly every museum still puts an emphasis on educational aims. The museum is a place for intellectual joy and enlightenment. Germain Bazin highlighted the museum's role as educator by comparing it to the university: "The museum has metamorphosed into a university for the general public – an institution for learning and enjoyment for all men" (Bazin, 1967, pp. 10–11).

The museums can rely on several methods in order to transmit their educational message, the most fundamental of whom is interpretation. An interested reading of art history is displayed in the museum space through the selection of objects and their spacial ordering. Wall texts and labels support that reading. Museums can furthermore use catalogs, homepages and all kinds of hand out materials for visitors to take home.

However, the traditional methods of mediation do not necessarily apply to new media art. There is a paradigm shift from transmission of a message to the interactive relation between work and spectator. Louise Poissant, professor at the Université du Québec in Montréal, specialized in the aesthetics of new media art, argues that the active relation between spectator(s), artists and art work would not only constitute the core of the works, but replaces the quest for artistic meaning, so important for the arts hitherto:

From now on, this quest for meaning will be of secondary importance, replaced by the primacy of a relation that counts on the active and creative role of the spectator. Condemned to vagabondage, the meaning of a work will now be one of the ways by which spectators and artists join together. A whole series of devices polarizing the attention on exchange modalities and the forms of experimentation will take over from this dimension once so central to meaning. (Poissant, 2010, p. 223)

The apprehension of new media art is often intuitive. It is not so much about the transmission of a constructed message, but about the experience with the work itself. Therefore, it often depends less on the museum as mediator who explains the work and thus assumes a different role for the curator (e.g. Cook, 2013, p. 394)

Furthermore, it is hard to identify one universal reading on the objects because of the variability of interactive media art. This chapter will first examine how meaning is created in the museum space itself. Museums provide a unique context for the works, thus influencing their interpretation and controlling their narrative. This hegemonic mode of art historical storytelling stands in direct contrast to the networked methods of content production common in new media art. Furthermore, the museum has a number of tools in order to mediate art beyond their walls, first of all the exhibition catalog, which will be discussed in the second part of this chapter.

3.5.1 Creation of Meaning in the Museum Space

The change of context, which is the inclusion into the museum space, profoundly changes the meaning of objects, redefining their uses and meanings and structuring their access. Former uses and meanings are not only unimportant, but invisible when removed from its original context. Thus silenced, the museum can impose their proper reading on the objects. The object then gains new characteristics, which were unimportant or not existent

before and the object then becomes an object of cultural style.⁴⁴

Museums were created in the spirit of the modernist belief in one meta-narrative that could be relied on in all times and all places. Public institutions such as museums were created in order to spread out this valid and reliable picture of the world throughout society, ignoring however that the idea of an objective, overall valid meta-narrative is itself a construction of modernist ideology (Hooper-Greenhill, 2012, p. 559). The new reading of the object is created through their location in the space and in proximity or distance to other objects.

The art production itself adapts to the logic of museums. The American art historian Philip Fisher sees abstract art as coherent continuation of the silencing process. First of all, these paintings and sculptures were already created, not for everyday use or for religious or political means, but with the goal to be exhibited in the museum. Thus they did not have to be silenced but their linear ordering and their cancellation of content already corresponded to the museum structures and processes. The stylistic cultural value would appear not only as one value among others, but as the essential subject matter (Fisher, 2012, p. 448). However, works which are not explicitly made to be exhibited in the museum space, but in another space, be it the internet or urban spaces, may find it difficult to integrate and compete in this institutional climate. The same is true for objects refusing to be silenced or to be subordinated to the museum ideology.

The construction and transmission of meaning is also an issue of power and control. In the museum context the interpretation of art history is made for others. The transmission of meaning is a linear information transfer from the institutions to the visitor, with the aim to enlighten and to educate, whereas the visitor has almost no feedback possibilities. Eilean Hooper-Greenhill criticized that the transmitted content is not tested against the public at large, but only against recognized members of the art world, like critics, journalists, or curators (Hooper-Greenhill, 2012, p. 569). Thus the museum controls authoritatively the transmission of meaning to a cognitively passive spectator.⁴⁵

The process of creation of meaning in the new media art community is inherently different and more democratic than in the institutional art world. Most new media art has developed outside the traditional museum world and does therefore not depend on the art museum for purposes of interpretation and context providing. Much new media art is distributed in the immaterial fabric of the internet with its constant changing content. Other platforms like festivals are generally accompanied by symposiums, lectures, and round tables, giving a voice to the public audience. In contrary to the museum, proposing a single, temporally, and spatially fixed reading, new media art evolves in an environment of multiple contexts and interpretations for the artworks.

Furthermore, much new media art opposes fixed interpretations with constant change. It

44 Philip Fisher uses the example of a sword whose weight, balance, sharpness and other properties were important for the warrior who used it in a fight but are circumstantial in the museum context. On the other hand, its characteristics as an art object are of no use to the warrior and could only gain weight once the social frame of art had occurred (Fisher, 2012, pp. 437–438).

45 Artists often criticized and attacked the authority of art institutions. However, museums were able to appropriate these works of art which initially expressed themselves explicitly against their strategies and processes. Thus museums incorporated artists and movements, such as Fluxus or Viennese Actionism, which deliberately challenged the museum and searched for exhibition spaces closer to the social fabric of everyday life.

can be variable, self-replicating, self-generating, mutating unpredictably, implying error and spread uncontrollably. The inclusion of the spectator, of hazard, and of self developing programs are resilient to fixed interpretation imposed by an institutional authority. How can a variable object that is different every time it is looked at and that develops in unforeseen and unpredictable directions be integrated into a static, art historical narration?

Even though new media art is not describable in traditional terms it does not resist all attempts of interpretation. There are approaches for the interpretation of new media art as well, but instead of describing and analyzing one image as for painting and photography, or a sequence of images as for video, the process and the function of the media artworks are in the core of its interpretation. Even though the content may change at any given moment, the overall process, the meta-structure, generally remains the same. The question how something looks like becomes less important than the question of what something does, or how something behaves. Thus it is not an abandonment of interpretation as some authors put it but merely a redirection.

In addition the democratic processes of construction of meaning and its variability, new media art challenges the museum's authority through its interactivity. The indefinite openness creates a situation in which the artist indeed conceived the piece, but its realization is left to the visitor, who can take on the role of a performer, user and co-creator. New media art can create spaces which gain meaning solely through active interaction with the beholder, which is preceded by an interpretation on behalf of visitor. Thus the museum has to give up at least some part of its control over the reading of the work. Furthermore, when a work puts an emphasis on a sensual experience, the visitor relies less on a cognitive explanation and thus the mediation of the museum. Much new media art deliberately renounces on clear, logically plausible explanations in favor for open reception situations.

New media art breaks with traditional processes of ascribing significance through interpretation and the providing of a context, thus challenging the museum's role as mediator of cultural value. It is difficult to ascribe interpretative significance because new media art describes spaces developing meaning solely in the interaction with the beholder, being meaningless otherwise, thus abandoning common modes of purposeful reception. New media art's significance does not evolve from its visual qualities, but from its behavior in the interaction with the visitor. Museums have to question their process of assigning fixed meanings in order to be able to deal with new media art, favoring a more democratic approach giving a voice to the visitors.

3.5.2 *Mediation Beyond the Museum Walls*

Today we live in an age of digital availability. The internet provides a seemingly endless source of information. Some authors even say that everything that is incompatible with the digital immateriality of the World Wide Web will cease to exist eventually, that includes art (Daniels, 2004; Wiencek, 2009). Much content that was formerly preserved for print media is now accessible in real time on the internet. However, the mediation of art is still very much paper bound. The book and the journal continue to be the privileged format for its analysis and discussion. This applies to the scientific reflection as well as to the mediation of art museums, whose main means to distribute content outside of their physical space is the catalog. Museums commonly accompany their collections and exhibitions with a catalog, dealing comprehensively with the collection or temporary exhibition. The visitor can take the

collected impressions home, admire the numerous color panels at rest and inform himself more deeply on the subject of the show.

While the possibility to reproduce the liveliness of an artwork in a printed picture is already restricted for most art (misrepresentation in size, haptic qualities, color, etc.) and can only give a small impression of the reality of the work, time based art renders the issue of representation even more complex. Whereas a printed representation of a painting cannot trigger a similar aesthetic experience as the original, it may give a board idea of what the original is about. The film still of a video can only represents a fraction of a second of the video, but can give little insight in the aesthetic qualities of the work. Similarly, a screen shot of a net art object or an installation view of an interactive environment may give an idea of what the work looks like but cannot help evaluate the interactive strategies, the narrative and the behaviors intrinsic to the reception of the work. Furthermore, the interaction with the work might be experienced differently by each spectator, develop, or change over time. Because of the difficulties of visual representation in the book format, authors writing about new media art often depend on exhaustive descriptions of the works in text form.

Paradoxically, and in defiance of its shortcomings, the book remains the main format for the reflection on media art. “Medienkunst profitiert nur wenig vom Verbreitungspotential elektronischer Medient, und ist eher Inkompatibel mit etablierten Wegen der Kunstverbreitung und Evaluation” Dieter Daniels states and advocates for a multimedia approach to the mediation of media art (Daniels, 2004, p. 90). The internet seems only little compatible with the common way of evaluation and theorization of art. This is mainly because common, scientifically accepted modes of publication are not necessarily respected. This concerns information about the text, author(s), date and location of publication, publisher, etc., but also references, citations and picture credits within the text. The networked mode of knowledge production of the internet do often not respect the established standards in humanistic research. Furthermore there is no quality control in the traditional sense.⁴⁶ The difficulty of the mediation of art on the internet are indeed similar to those of the writing of the wall label, discussed in length above, and summarize in the incompatibility of established categorizes and vocabulary with the distributed mode of production.

A multimedia approach to the mediation of art offers entirely new possibilities and avoids the difficulties encountered with the visual representation of media art. Dieter Daniels carried out two ambitious projects in cooperation with the German Goethe Institute and the ZKM, a book project in two volumes *Media Art Action: The 60s and 70s in Germany* and *Media Art Interaction: The 80s and 90s in Germany* (Daniels & Frieling, 1997, 2000) and the online-platform *Media Art Net*. The two volumes of the book combine scientific inquiry with a CD-Rom containing not only pictures of the works, but the actual works whenever possible. The selection of the art for the CD-Rom was comparable to the one of an exhibition and indeed, the project is comparable to an exhibition in CD-Rom-book format.

The approach could also be used for the creation of museum catalogs in order to avoid the representation problem. The project was more complex than the editing of an exhibition

⁴⁶ The internet has in fact its own mechanisms of quality control. At platforms of distributed writing, like the online encyclopedia *Wikipedia*, the functions of the editor are taken over by the online community. Every user is able to edit texts, to control and upgrade the content. As a result, the online platform is not necessarily less accurate as the 2005 study *Internet encyclopedias go head to head*, comparing a selection of *Wikipedia* articles with those of the well-respected *Encyclopedia Britannica*, conducted by the scientific journal *Nature* showed (Giles, 2005).

catalog and could be carried out only with a team of authors, editors, programmers, and interface-designers. However, Daniels noticed that even though the CD-Rom was at the core of the project, it was perceived by the public as mere byproduct, or as complement to the book. The book remained in the center of public attention (Daniels, 2004, p. 101).

The net project *Media Art Net* is an online platform aiming to provide freely accessible, highly qualified content. On the homepage scientific articles tracing back the development of new media art are grouped according to topics and accompanied by online art projects and extensive documentation on media art installations and environments. The goal was to create an online platform equally appealing to the interested surfer as to the expert researcher, with an audience larger than the usual circle of experts and insiders. Similarly to the book project, the online platform was only realizable in collaboration with a group of people specialized in different professions. Furthermore, in contrary to a book, an online platform constitutes in an ongoing engagement. Not only need the domain and the server space be paid for, but also and more importantly, it needs to be updated regularly. In contrary to a book, it is expected of a website to be always up to date. Thus, it is often not sufficient to create a homepage and to put it online, but it is expected that it remains up to date and maintained. Finally, the model of freely providing content on the internet comes inevitably with an income problem.⁴⁷ Since there is generally no income created through the visit of a homepage, the projects can only be realized with an alternative financial model, such as advertisement or sponsoring.

Inevitably, both approaches will have to face similar problems concerning their conservation like all media objects. The CD-Roms, which can be considered as the heard of the project, will become obsolete or unreadable and the online platform may one day be taken of the net. Already today numerous links to other pages and art projects are not working anymore. Nonetheless, the multimedia approach can enlarge the present-day use of the paperback exhibition catalog. CD-Roms may accompany the catalog and online platforms and discussion forums could provide further information on an exhibition and integrate the spectator into the creation of context and interpretation of the work. While both are still relatively time intensive and thus expensive, it can be expected that the creation of a homepage or a CD-Rom will become less expensive, when institutions will have collected experiences in this matter.

4 Possibilities Offered by New Media Art to the Art Museum

The first two chapters concentrated on the ways new media art can be challenging for art museums and for the art world in a more general sense. However, new media art also offers new possibilities to the museum. The introduction of new media art into a museum offers possibilities which may lead to the often requested democracy in the art world. New media art might attract a new audience to the museum, whose composition may be different from the usual museum public (chapter 4.1 New, Democratic Audience). New communication technologies, first of all the internet, enable artists to release their work on their own and to advertise for themselves, but it also allows for the first time to integrate the spectator into the

⁴⁷ This difficulty is visible in the whole print media industry, but especially in the news paper branch. The free accessibility of information in real-time on the internet has deeply influenced journalistic methods. Unfortunately, the pressure to provide information accessible as quickly as possible often comes along with a degradation of the quality of the content.

curation process (chapter 4.2 Distributed Curating).

The development of new media art and other, more traditional art forms intersect at many levels. The confrontation with new media art can put a different light on contemporary art practices (chapter 4.4 Contextualization and Commitment to an Inclusive Collection). Finally, the investment into new media art might be attractive for museums, not only because the works are still relatively cheap in comparison to other media, but also because funding for new media can easily be found. The final chapter will investigate if and how new media art can bring new funding to the museum (chapter 4.5 Sources of Financial Revenue).

4.1 New, Democratic Audience

The museum traditionally is understood as an educational institution, bringing some kind of intellectual benefit to its visitors. This transmission of knowledge is one of the museum's main mission and reason to be. A high number of visitors is often used as an indicator for the high quality and the wide reach of the institution or exhibition, a welcome argument in the search for funding. Especially in the light of shrinking public funding and financial insecurity museums give in the pressure of sponsors and financiers to attract a large number of visitors (Altstatt, 2004, p. e.g.).

However, museums have to compete with multiple competitors on the leisure market. Some find the more and more imaginative events, late night openings, museum club nights, or salsa classes in the attempt to attract large visitor numbers. Art museums are repeatedly criticized for their effort to gain high visitor numbers at all costs. To obtain these they would be willing to waive all content and to organize hype for the sake of the hype (Vitali, 2000, p. 103). In order to attract a large audience without giving up their status as cultural mediators, museums have to find some tightrope walk between leisure and education (Hudson, 2012, p. 86). New media art, being associated more with leisure than traditional art forms, could be used as a tool for museums to interest a new public for the art museum.

Even though museums claim to be directed towards the public at large, so to say towards all parts of the population, the suspicion, museums would mainly be visited by a certain economic group is persisted. Edward Alexander claims, museums would “appeal only to the educated few, collect objects valued by the wealthy leaders, while immigrants, blacks, and other deprived minorities as well as the poor have been ignored, their cultural contribution and needs forgotten” (E. P. Alexander, 1979, p. 14). Indeed, participation surveys demonstrate that the public of art museums is less democratic than for other museums and less than one quarter of the European population visits art museums at all (Hooper-Greenhill, 2012, p. 558; see also Schuster, 1994).⁴⁸

It has often been argued, new media art would have its own public different from the usual museum visitors. Hence, the inclusion of new media art objects could be a possibility for museums to target people outside the art world, allure them in the museum and interest them for art. The correlated argumentation would be that the attraction of a larger public indicates the success of an exhibition what in turn contributes to the justification of the museum as public institution. But can new media art really attract a large audience and how is this audience composed?

⁴⁸ Some attempts have been made to attract a more conclusive public. John Cotton Dana, founder and director of the *Newark Museum* in New Jersey in the early 20th century, successfully reached nearly all parts of his community with special exhibitions targeting minority groups (E. P. Alexander, 1979, pp. 13–14).

Since the general restrictions of 'do not touch' and 'be quiet' do generally not apply to interactive media art, it is often appreciated by children. In media art exhibitions one can frequently observe children interacting with the different devices, playing with them and observing the responses to their actions. Soo-Jin Lee and Kwang-Yun Wohn observed that the most popular pieces in an exhibition including new media art are often those allowing a playful approach to the work with immediate, interactive responses (Lee & Wohn, 2008, p. 458). Beryl Graham made a similar remark in his analyze of the *Serious Games* exhibition (1996/7), noting that the artworks of a "more interactive" category, *Zeromorphosis* and *Resonance of 4*, are the most positively mentioned in the comment book, leading him to the conclusion that they must have been the most popular works in the exhibition (Graham, 1997). Finally, the ZKM claims that their main strength is the playful connection of art and technology and the interactivity ("Statistische Auswertung der Besucherumfrage im November '98," 1998).

The playful and interactive approach of new media art offers the possibility to experience art in a different way and is especially attractive to sensitize children for the world of art. However, the playfulness of new media art is not to be understood as a lack of serious content. A balance between what Hudson calls leisure and education, or joyful interaction and artistic quality has to be found also for new media art.

Also, unlike much contemporary art, new media art does not require much knowledge of art historical or technical nature (Dinkla, 1997, p. 96). It is often deliberately created to be experienced by an unprepared public. The experience may even be less effective, the more you know about the work.⁴⁹ New media art can be experienced on a different channel than traditional art, what can be useful in order to attract people to the museum.

The exhibitions *010101* held in 2001 at SFMOMA and *Serious Games* (1996-1997) at the Laing Art Gallery in Newcastle and Barbican Art Gallery in London were both exhibitions of contemporary art inquiring the relation between art and technology. Both exhibitions included analogue and digital art as well as net art. While both counted fewer visitors than monographic exhibitions of dead, white, male artists held at the same institution, they were able to attract more people than contemporary art group exhibitions. In both cases the public was also slightly younger than usual for these institutions (Cook & Graham, 2010, p. 178). Can thus be concluded that new media art is more popular than contemporary art groups but less popular than dead, white, male artists?

Head counting can be misleading, especially for new media art since it does not take the online audience into account. When the online audience is added to the visitors of the physical space the total figures might be comparable to those of monographic exhibitions of dead, white, male artists. The online audience of *Tate Online* counted over 1,7 million hits in 2002, which is comparable to physical galleries in Tate Modern, such as the art now space (Rellie, 2003). While the average length of the visitor was just over 7 minutes, thus a little longer than the 6 minutes for websites in general, it remains unclear whether the visitors specifically visited the site for its web art offer or in order to obtain information related to Tate's physical exhibition.⁵⁰ Furthermore, the audience of a museum's web presence is typically more global

49 Dinkla mentions Myron Krueger's *Videoplace* as an example. He claims that the experience is interesting only as long as the visitor has not quite understood the underlying roles of the interaction.

50 Nonetheless, net art is an opportunity for museum to diversify their online presence, especially since the acquisition price for net art is still relatively low and the museum already has the necessary infrastructure

than in the physical space, since visitors can access the sites from all over the world without having to physically move to a specific location.

The number of visitors in an online exhibition does not necessarily prove the relevance of the page. The more hits a certain homepage has, the higher it is listed in search engines and the easier it can be found, leading again to more visitors, while homepages with fewer visitors remain more difficult. This circularity of the feedback loop makes it more difficult to build an audience necessary for new online projects.

Visitor numbers and ticket sales alone cannot represent the reach of media art exhibitions. Rosanne Altstatt, from 2002 to 2004 director of the Edith Russ Site for New Media Art mentions that their events were often well covered by newspaper articles. Another point to be taken into account is the audience's behavior. Quite logically, when the laws 'do not touch' and 'be quiet' no longer apply, the audience's behavior changes. People are testing out the offered possibilities of interaction instead of merely contemplating the works. Consequently, the time invested in a media art object is generally longer than with other media. Attendants and docents at the 2001 *010101* exhibition at SFMOMA observed that people stayed longer than in other shows and that they returned repeatedly for further visits (Graham, 2002).

For Rosanne Altstatt, "another measurement of success is the fact that a great part of the visitors are quiet young, something found at no other art institution in the area. Outreach is really working when people who would not otherwise take an interest in culture become repeat customers" (Altstatt, 2004).

As Altstatt observed in Oldenburg, new media art can attract an audience different from the typical museum public, thus confirming the argument that new media art can be used in order to sensitize a new public for art. It has a strong, but relatively closed circle of supporters. A better representation in the art world could also increase the interest in new media art, what is beneficial not only in terms of publicity, but also in order to obtain funding and to be preserved for future generations. The presentation of new media art in the art museum thus could augment and diversify the audience of both, the art museums and new media art.

4.2 Distributed Curating

The term distributed curating describes a form of collective curation. Curation is a form of immaterial labor and therefor inherently collective. Lazzarato states: "This immaterial labor constitutes itself in forms that are immediately collective, and we might say that it exists only in the form of networks and flows" (Lazzarato, 1996). An exhibition, at least one of a certain size, can only be organized by a team of people including not only curators, but also research associates, secretaries, technicians, advertising specialists, architects, and so on. For new media art this list of people is widened by programmers, computer specialists, graphic designers, and informational architects. Nonetheless, curating an exhibition is always correlated to issues of power and control over a message. A relatively small group of people decides over the content of the exhibition and the message which will be received by numerous visitors. The hierarchy of the museum further structures the influence of the collaborators over the result. The model of distributed curating, which will be discussed in the

(homepage) to exhibit it.

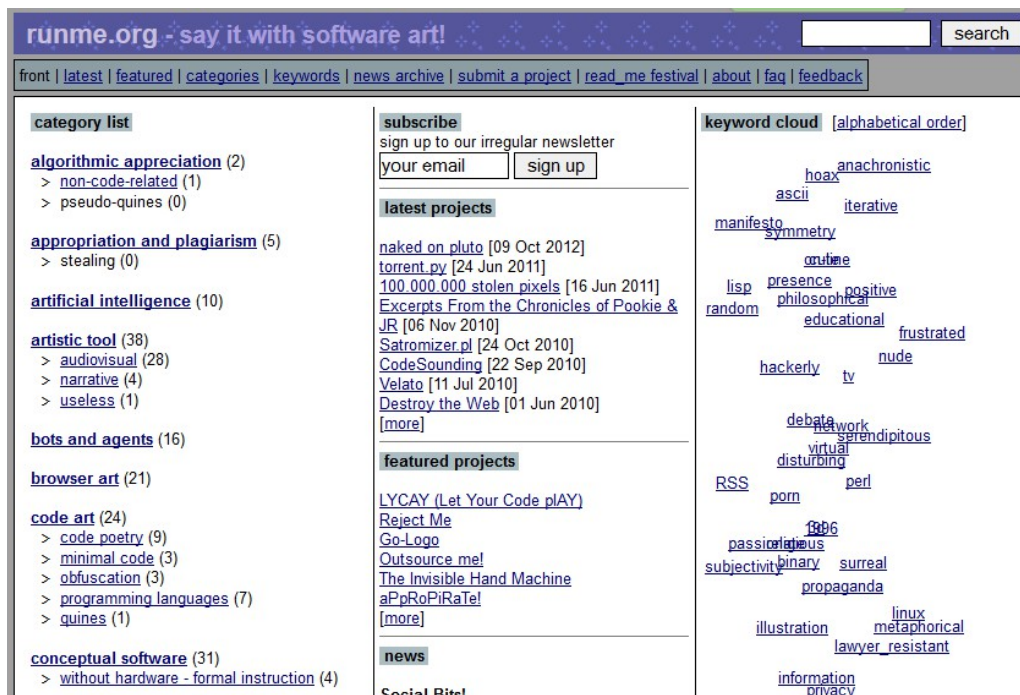


Figure 32: Amy Alexander, Florian Cramer, Matthew Fuller, Olga Goriunova, Thomax Kaulmann, Alex McLean, Pit Schultz, Alexei Shulgin, & The Yes Men, *runme.org* (since 2002), webpage, screenshot.

following, offers a new and more democratic approach to curating enabled by new telecommunication technologies.

Distributed, or collective curating allows for an inclusion of the public into the decision making process from the choice of the exhibited pieces to their context and the construction of meaning through cross references and commenting text. In the art museum, interpretation is done for the audience (e.g. Hooper-Greenhill, 2012, p. 567). The distributed curating approach allows the spectator to elaborate and share an own interpretation. While this approach is naturally more common in the online community, some museums also released projects of distributed curating.

On social media web sites, such as Facebook, Google+, Twitter, blogs and video sharing sites like YouTube, content can be produced and shared with friends and followers by everyone. These sides have become social reading or social content sharing networks, where the audience is increasingly encouraged to share their media consumption experiences through the curation of information (e.g. Villi, 2012). While Institutions and single artists use the possibilities of social media sites for the sake of advertisement and distribution of information, the practical opportunities offered by social curation for art exhibitions are little pursued by the institutional art world.

Some homepages like *Runme.org* or Eva Grubinger's *C@C – Computer Aided Curating* (1993)⁵¹ created living and discursive environments taking the networked and distributed models, inherent to new media art into account. *Runme.org* (fig.32), created in 2003 in the wake of the *Readme* festival, held for the first time in Moscow in 2002, is an autonomous

51 *C@C – Computer aided curating* was probably the first software driven framework combining production, presentation, recreation, and purchase of art. It offered editing tools for artists, a social network function for commenting, and dealers could purchase space in order to present their activities. *C@C* combines artistic creation and curation and is itself regarded as a work of art (Krysa, 2008, p. 99; Paul, 2006, p. 27)

repository for media art, encouraging people to submit projects and to comment on them. It is an open and collaborative project which was initiated by Amy Alexander, Florian Cramer, Matthew Fuller, Olga Goriunova, Thomax Kaulmann, Alex McLean, Pit Schultz, Alexei Shulgin, and The Yes Men. *Runme.org* aims to be an open exchange interface for artists and programmers in order to support the contextualization of their works. The ordering of the works takes place with the aid of curatorial software, organizing them taxonomically in a list of categories and in a keyword cloud. Everybody is able to submit new projects for exhibition or comment on existing ones. The only qualitative control tool is a changing team of experts, reviewing the qualitatively best works submitted and evaluating whether a submit fits the basic criteria of the site before it becomes available online (Paul, 2006, p. 28).

The creators of *Runme.org* describe the aim of the project as following:

Software culture lives on the Internet and is often presented through special sites called software repositories. Art is traditionally presented in festivals and exhibitions. Software art on the one hand brings software culture into the art field, but on the other hand it extends art beyond institutions. The aim of *Runme.org* is to create an exchange interface for artists and programmers which will work towards a contextualization of this new form of cultural activity. (A. Alexander, Goriunova, McLean, & Shulgin, n.d.)

Runme.org can be understood as a critical response to the traditional gate keeping function of the art museum. It proposes an alternative model for the submission, selection, and evaluation of art. *Runme.org* deliberately limits the curatorial control to a minimum. By allowing not only works to be submitted by the public, but also to be commented and to propose terms for the keyword list and word cloud the user becomes active as context creator instead of being merely consumer of the cultural offer. The control over the final output in the form of a variable, developing online exhibition is surrendered to the software.

The aesthetically little appealing form of presentation in the database format avoids hierarchic classification. Only some works are highlighted by the expert group. All the others stand equally next to each other in the list of categories. While this refusal of a hierarchy or a classification whatsoever of the works might be intended by the net art community and the creators of the platform, it bears difficulties, especially for the occasional visitor, inexperienced, with little knowledge of net art and a limited attention span and amount of time available. For the non expert visitor it becomes difficult to distinguish key works from less important ones. The occasional visitor will select works more or less randomly and when this selection does not meet the spectators expectations he might be disappointed and lose interest in new media art altogether. Hierarchy and classification, in spite of the obvious critique, help direct the attention and match the visitor's expectations with the aesthetic experience.

Distributed curating platforms fulfill the net art's promise an independent art world outside the institutional one. It enables the spectator to become active as a curator providing the context for the works. Furthermore it allows for immediate feed-back on the aesthetic experience. On the down side, these net art platforms, mainly visited by the net art community, find still little recognition in the institutional art world and the distributed and networked mode of content creation is not acknowledged by the scientific community. This lack of recognition might be founded in the deliberate disregard towards authorial narratives and quality control. Content with high and low quality stand equally next to each other on the internet. It lies upon the spectator to make his own assessment.

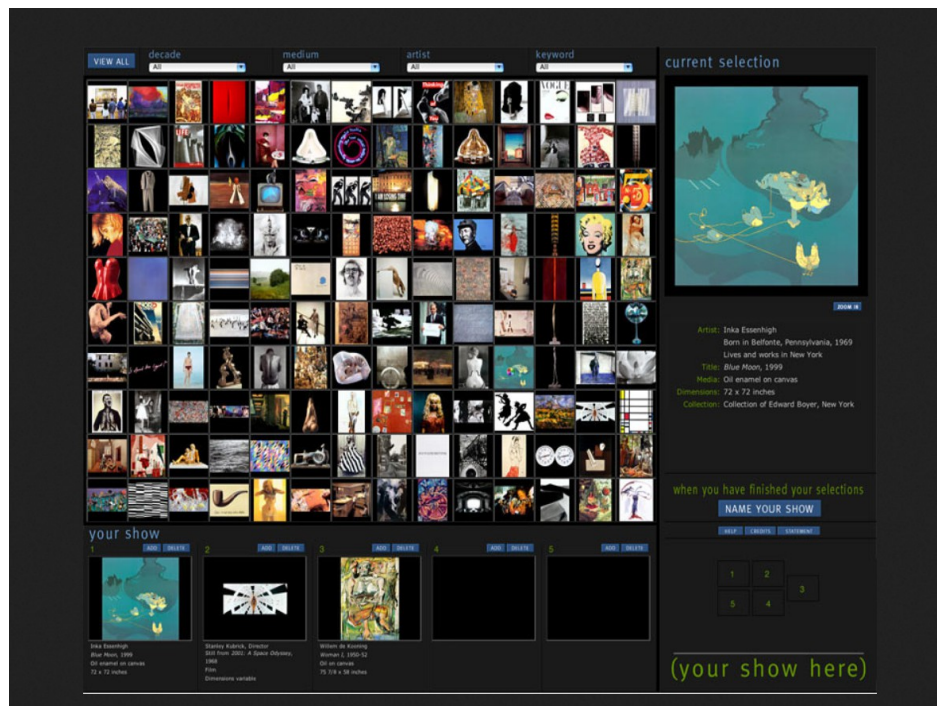


Figure 33: Nina Dinoff and Scott Patersonthe, *(Your Show Here)*, January 26 to May 19 2002, webpage, screenshot, Massachusetts Museum of Contemporary Art.

An attempt to integrate the model of distributed curating into the institutional museum world was made by the Massachusetts Museum of Contemporary Art. In the Project *(Your Show Here)* (fig.33) by graphic designer Nina Dinoff and information architect Scott Patersonthe, shown from January 26 to May 19, 2002, the spectator could select 5 works of art from a database of 140 images of 20th century art and write a short statement about the selection. The images and the statement were then projected to scale on the museum walls until another selection was submitted. As the museum states, the project aimed to enable the spectator:

to tell vastly different stories and disclose conflicting truths, highlighting the subjectivity inherent in arranging, presenting, and finally, viewing works of art. In this case, viewing is not static, passive, and scripted, as it often is in the museum context. Instead, without the active participation of the visitor there would be nothing to view. (text from the art cart accompanying the exhibition available on Dinoff & Patersonthe, n.d.)

The exhibition takes account of the often pronounced critique on museums to create history by means of authority (e.g. Fisher, 2012; Hooper-Greenhill, 2012), and transfers a part of this authority to the spectator. While the database interface of *Runme.org* limits the possibilities to create a narrative within the exhibition, the confrontation of a small selection of works in *(Your Show Here)* enables the spectator to tell a story with an insightful selection of works. However, *(Your Show Here)* does not give the same liberty and independence from the institutions authority and control to the spectator. Many factors are already predetermined like the pre-selection of a limited amount of artworks and the space preserved for its presentation in the Massachusetts Museum of Contemporary Art, the length of the text that can be edited by the spectator and the amount of images that can be selected. Furthermore, the presentation only contains representations of the works and not the originals.

Even though both projects, the online platform *Runme.org* and *(Your Show Here)* work

with virtual spaces or virtual representations of the art and not with physical works in physical space, they display possibilities for the integration of the public into the curatorial process and show effective alternatives to the institutional mode of creation of autocratic creation and linear transmission of art historical meaning.

4.3 New Means for International Collaboration

The possibility to clown or reproduce media objects is not only a challenge to the way museums think of their collections, it also offers new models for the construction of museum collections. Media art objects can be presented at several locations at the same time. One of the most common strategy to keep digital information safe is to back it up on several copies and to store it at different places. Art institutions could use this method to their advantage by sharing their collections. Instead of persisting on the wish to have a singular exhibition with unique objects and putting much effort in the artificial creation of singularity for reproducible objects, museums can cooperate and create shared collections. The reproducibility of artworks could thus create new models for international cooperation. Museums no longer would have to raise the funds for the acquisition and preservation of a work on their own, but could collaborate, combine their resources, not only financial ones, but also their know how, and their infrastructure by sharing the property of their objects.

While it is already common practice for temporary exhibitions to travel and to be shown at different places, new media art can augment this possibility. A museum would no longer have to renounce on the presentation of a work in a permanent exhibition in order to put it on loan for another institution. The work can simply be presented at several locations at the same time, what can also create interesting synergistic effects for those works which are networked or collaborative. The possibility to deliver the works on the internet also reduces transport costs and risk of damage.

The characteristics of new media art open the institutional world up for new forms of international collaboration. Richard Rinehart imagined an open museum, with a shared collection, a kind of meta-collection allowing many institutions access to the art works, but also sharing the responsibility for its preservation and the costs for its acquisition (Rinehart & Ippolito, 2014, p. 110). There are similar developments in other institutional fields, like in the libraries, which often share a kind of national meta-catalog and lend books to each other, or in the science community. NASA and NSF have created a public database for astronomic observations and all research funded by NASA must be made available on this database. This accessibility of data has lead to a revolution in the way astronomers conduct research. Today, more research is done with information from this database than with actual telescopic observations. In the open Museum, similarly, the art works could be make available not just for one, but for all art institutions what could revolutionize the museum by facilitating public access to art.

Another parallel development is on the rise in the sector of private art collecting. So called arthoteks imply the methods of literature on visual arts. They acquire art for the public to rent, like a book in a library. For a small monthly fee, works of the collection can be taken home for a couple of month, thus democratizing in a way the access to art. However, the ownership as well as the responsibility is, in this case, not shared like in the open museum, but monopolized in one institution.

For the open museum to work however, museums will have to rethink the way they

brand themselves. “We pride ourselves on our unique collections,” Richard Rinehart, artist and curator at the Berkeley Art Museum pointed out and continues with asking, “so how would we as museums address this? How would we brand ourselves, if not on our unique collections?” (“Preserving the Immaterial Transcript,” 2001).

The reproducibility of media art objects, which is described by Rinehart as one of their mayor problems can be turned into a major advantage of these objects. In times of shrinking museum funds museum collaborations and shared property can help to build up substantial collections. By sharing the costs for acquisition and preservation of artworks museums can gain access to more, or more significant works. Furthermore, instead of priding themselves with having a unique collection, museums could advertize their associating with internationally respected institutions. Furthermore, when exclusivity no longer is significant, museums would have to compete based on what they do with their collections and not based on what they have in their collection. This could give rise interesting and experimental new curation practices. Curators would still exercise their selective role, however they no longer would be restricted by what others have collected already (Rinehart & Ippolito, 2014, p. 112). Works of art could thus be freely combined in an exhibition with the goal to propose a new readings and experiences of the works.

The New Art Trust, the Museum of Modern Art New York, the San Francisco Museum of Modern Art and the British Tate negotiated in order to create a shared collection of new media art. The unique initiative gave rise to the *Matters in Media Art: Collaborating Towards the Care of Time-Based Media* project. Originally created to provide guidelines for the preservation of time based artworks, the project started acquiring media art in 2007, thus building up a collection which is shared between the four partners. The long term goal is to develop a shared responsibility for the work’s care and preservation (“Matters in Media Art | Tate,” n.d., “MoMA | Matters in Media Art,” n.d.). Thus the cooperating institutions combined their resources for new media in order to create a more substantial collection. While the *Matters in Art* project is still a unique and relatively new initiative, it stands exemplary for the inter-institutional exchange enabled by new media.

Matters in Art and Media is an example for institutional collaboration with a long term objective. Another possibility is the collaboration on a temporally limited basis. The exhibition *Net_Condition* which took place from September 23rd, 1999 to January 09th, 2000 is an example for international collaboration on a temporally limited basis. The project's aim was to give a comprehensive overview of the current status of international net art and to introduce political and economic ideas, social practices, and artistic applications of on-line communication, to investigate how new media communications take part in the construction of reality. Peter Weibel, curator of the exhibition, justifies the importance of the work as following:

To an increasing extend, the construction of the world is being dominated by the media. Society is increasingly becoming a media society. This is why media observation is increasingly taking place of world observation in art. From law to functional markets, from leisure to the world of work, from eroticism to politics, there is no social sphere that isn't decisively shaped by individual and mass uses of media. (Weibel & Druckrey, 2001, p. 9)

The exhibition was a networked, multimedia, and multi-local event. 100 works were presented at the ZKM in Karlsruhe, the Steirischer Herbst Festival in Graz, the ICC Intecommunication Center in Tokyo and the MECAD Media Centre d'Art I Disseny in

Barcelona and in the global public media space. There were, for example, projects for the distribution of art in newspapers or on television and on the electronic media space, the World Wide Web. Because of the global reach of the subject of the project, a multinational approach to its realization made a lot of sense. However, the project was not a traveling exhibition, but each location had its own particular contributions. The opening exhibition of the Steirischer Herbst Festival for example focused on film as medium for the construction of reality with media installations; CD-Rom, computer and imaginary television based on the works of the documentary film makers Joris Ivens, Chris Marker, and Harun Farocki, whereas the exhibition at the ZKM focused on art dealing with the genuine characteristics of the internet.

Both examples illustrate possibilities for international collaborations which have become possible because of new media art. They offer a multi-local approach to the presentation and mediation of art, taking the globalized characteristic of contemporary art practices as well as local specifics of an institution into account.

4.4 Contextualization and Commitment to an Inclusive Collection

In 19th and 20th century museums aimed to provide an encyclopedic collection. The goal was to represent a comprehensive history of art and to present all artists and schools which were considered the most influential. The presentation of the collection was most commonly ordered geographically and chronologically according to places, periods, and schools. The presentation revealed the historical development of art in the purpose of study and education of the people.

Up until the 1980s, the encyclopedic overview was standard for permanent exhibitions with the Museum of Modern Art in New York as model, surely because of its exemplary collection of modern art (Serota, 2000, p. 84). The Museum of Modern Art, regardless its status as antetype, already demonstrates the insufficiency of this model by focusing on only some art centers and movements which are regarded as the most significant. Art that was created before 1940 outside of Paris and after 1950 outside of New York is underrepresented. Nicolas Serota criticizes that for example the German expressionism and European art from after the Second World War was insufficiently represented. Only three European artists from after 1950, Bacon, Dubuffet, and Giacometti were presented in the exhibition (Serota, 2000, p. 85).

If comprehensive, encyclopedic collections still were standard in the museum world, it could easily be argued that, for the completeness' sake, all movements and media should be adequately represented in a museum's permanent exhibition including interactive media art. The encyclopaedic approach to collection management would demand for its inclusion, even if it would not be first choice material for a particular curator. The argument has obvious shortcomings when completeness is no longer pursued nor desired. Institutional collections are always only a cut out, but not representative for all art. Inevitably, every museum will have to focus on some periods and movements and establish some guidelines for its collections and interactive media art does often not endure the selection process.

Benjamin Ives Gilman argued already in 1909 in favor of what he calls 'choice collections' and states that comprehensive collections would be incompatible with the goal to collect works of first quality and to show them in the best way: "For the ideal of completeness is impossible of realization without the acquisition of secondary material and generally reproductions; and from a little of every stile the content of no one can be adequately

gathered” (Gilman, 2012, p. 422).

Even though museums recognized that this encyclopedic collection is impossible and changed their focus from a merely educational institution to an actor on the competitive leisure market, these institutions still are actively shaping our understanding of the past. By choosing what to buy, to present, and to preserve the museum is structuring our access to the past. “Thus it affects not just our understanding of and access to the past, but also our relation to the future by choosing the legacies that are available to us and to future generations.” Charlie Gere argues in his 2012 paper *New Media Art and the Gallery in the Digital Age* (Gere, 2004, p. 5).

Digital technologies have an increasing impact on our everyday live, structuring our work and social relations, our means of communication, our collective memory and profoundly altering our perception of time and space. It has often been argued that new media art, or digital media art would analyze the technical condition of our everyday lives within the means of this new technology. Thus, it would intensify the understanding of how new technologies transform the very condition of our lives. “Media art history and media archeology are a valuable aid to understanding our present and our future goals in a period where the pace appeared to get faster and faster – that is the episemological thesis (Grau, 2010, p. 8).”

Furthermore, art created in other media can be profoundly influenced by the characteristics of digital technologies, even though this influence might not be explicit. Nicolas Bourriaud claims, any new technological apparatus would deduce a certain number of changes in ways of thinking and thus in the art practice: “The appearance of a major invention [...] clearly alters the relationship between artists and the world, on the one hand, and methods of representation as a whole on the other hand” (Bourriaud, 2010, p. 66). Accordingly, technological change influences the arts on two major ways: through the alteration of the way of thinking about the world, which is source of inspiration for artists, and by providing new artistic means of representation. Indeed, artists might reflect relevant conditions of life on an unconscious level (Duchamp, 1957; Gere, 2008).

New media art is part of a wider cultural transformation. Machines have for many years influenced our perception of the world and the digital machine has revolutionized it. Digital and portable devices frame our view, organize communication, filter our information, allow us access to a multitude of cultural products, count our steps when we are walking, or measure our heartbeat when we run and thus profoundly transformed the way we perceive our environment. This condition has a deep impact on cultural productions and therefore art in digital media should not be discussed outside of contemporary art practice in general. An aesthetic approach that separates the digital from the aesthetic based on analog technologies hides the many intersections between both and suggests that they develop independently, when, on the contrary, they are joint together. Andreas Broeckmann argues in his article *Image, Process, Performance, Machine: Aspects of an Aesthetics of the Machinic* for a joint discussion of media art and more traditional techniques. The aesthetic categories used in new media art “-image, execution, performance, process, machine – from no conclusive list, (...) provide a samples of terms which can open up a renewed dialogue about contemporary aesthetic theory that uses the experience of digital culture to rethink art (Broeckmann, 2010, pp. 194, 204)

Charlie Gere agrees with the idea that the confrontation with new media art reveals new approaches for the interpretation of art. He goes so far as to claim that new media art lies at the core of the understanding of post war art:

It has a long and important history, which intersects at crucial points with other better-known forms of art practice. Indeed, those practices would be very different without this kind of work. Renewed interest in it will enhance and deepen our understanding of artistic developments in the post-war era. I would go so far as to suggest that no attempt to understand art of that period can be undertaken without taking into account such work. (Gere, 2004, p. 10)

Many argue for the importance to collect new media art because of the quality of the works (Jana & Tribe, 2009, pp. 24–25; Lieser, 2009, pp. 268–273). However, even if a curator does not see its artistic value or is insensitive to technological art, the inclusion of those works can be profitable for exhibitions, temporary or permanent. Given that meaning is not inherent to an object but constructed through interpretive strategies, it can be beneficial for an exhibition to integrate new media art, even if a curator is not convinced by its artistic value, because it can reveal aspects of interpretation, which would remain invisible otherwise.

This does not mean, that every art museum now has to build up a big media art collection, but they should open up to the idea to acquire some works of new media art, experiment with different set ups in their gallery space, make experiences with their documentation and preservation and share these experiences, even failed ones with other institutions. Such small steps already help to deconstruct barriers between the museum and interactive media art and might have a long lasting impact, leading to a conclusive media art inventory in the heart of collections of contemporary art.

4.5 Sources of Financial Revenue

The financing of the typical art museum's work originates mainly from four sources: public and municipal founding, friends of the museum associations, sponsoring, and revenues generated by the museum (guided tours, cafeteria, shop, ticket sales, etc.). In times of shrinking public funds and empty treasuries, museums depend more on the other financial pillars. In reaction to the reduction of governmental subsidies, museums modified their income strategies. The museum shop, for example, still exceptional when the Metropolitan Museum first established its shop in 1908, created 25.9% of the average income of museums in 1997 (Heilbrun & Gray, 2001, p. 210).

Another currently increasing source of financial resources is sponsoring. Still rather uncommon only 30 years ago, sponsoring has become an important part of the museums' finances. When Jean-Cristophe Ammann proposed in the late 80s to search private sponsor for the Museum für moderne Kunst in Frankfurt, which he presided as director since 1987, he was mocked for his idea. “Nein, das solle ich mal lieber sein lassen, hieß es aus dem Kulturdezernat, das gehöre sich nicht” Ammann remembers (Frey, 2001). He was finally able to raise over 10 Million DM (around 5 Million €) for temporary exhibitions and acquisitions, thus saving the status and the reputation of the museum.

Today, much of the museums' work depends on the investment of the private sector. Private, commercial companies might be interested in supporting the arts as part of their corporate identity and their imaging. Thus, banks and big industrial companies often support cultural institutions and projects in their region financially.

The inclusion of new media art may provide an opportunity to motivate new supporters

and increase their donations. Funding can be increased not only in the context of a larger, more widespread range of visitors, but museums can also seek for support by technological companies and scientific institutions, or such foundations aiming to bring art and science closer together, like the Daniel Langlois Foundation for Art, Science and Technology.

Companies from the computer and software branch manifested an interest in supporting artists' working with digital media. Jeffrey Shaw obtained funding from IBM in order to exhibit two of his works, *Narrative Landscape* and *Legible City*, at the *Siggraph Art Show* in 1985 and 1989, which took place in the context of the biggest international Computer conference and fair.

Examples of technology companies sponsoring new media exhibitions and institutions are easily to be found. In 1999 Peter Weibel, director of the ZKM, was seeking a partnership with Cisco in order to finance the *net_condition* exhibition (Weibel, 1999). Such a partnership can be beneficial for both parties – the support of cultural events have a positive effect on the image of the company and the museum obtains funds to realize its projects. Previously, the ZKM had already collaborated with the German industrial enterprise BOSCH. The New Yorker DIA Center for the Arts obtained funding from the NYSCA science program and the Lila Wallace Foundation, a fund which supports innovative ideas in the area of learning and school education for their net project.

However, it is not always easy to motivate commercial companies to become active collaborators in cultural projects. "Ironically, we did not get high tech funding for [*Bitstream*], so (...) it's not as fundable as you might imagine." Larry Rinder from the Whitney Museum of American Art in New York stated in an interview with Susan Morris. His colleague at the Whitney Christine Paul countered "Funding right now is easy because the subject is sexy. French Telecom founded the last Biennial new media component" (Morris, 2001).

However, private sponsoring does not come without strings attached. Donors might want to influence museum policies directly or indirectly and connect constraints to their donations. Donors might be interested in the transmission of a special message or have conditions concerning the presentation, conversation, or holding of a work which might result in future costs, including opportunity costs. Museum thus have to evaluate carefully the long term impact of a donation. Anyhow, being able to secure the financing of a project is not a good enough reason for its realization. The project also has to be compatible with the museums over all, long term programming and strategies.

5 Conclusion

New media art challenges the art museum. Not only does it have characteristics that are uncommon in the museum environment, but it also conflicts with traditional functions and methods of the art museum. Although both are not entirely new in the art practice, most characteristics of new media art can be traced back at least to the 1960s, where they can be found in participative art forms like performance and happening, they failed to be fully integrated into art institutions.

The problems connected to the technological equipment can be resolved relatively easy. New media technologies became not only more user-friendly and affordable, but also mobile, meaning that it can be rented for temporary exhibition projects. The ideological conception is more challenging, because it stands in direct conflict with museum standards and habits.

Museums are used to dealing with stable objects, remaining identical over a possibly unlimited period of time. New media art however abandons this stability in favor for variable, immaterial structures evolving with the participation of the spectator. The notions of user participation and immateriality are challenging for the museum.

The inclusion of the spectator as participants in an interactive event interrogates the museums' much questioned authority over the construction of an art historical narrative. New media art allows the spectators to express themselves through the interaction with the work, thus giving a voice to the audience. Also, the networked methods of content construction in media communities replace the linear mode of information transmission of the museum with multiple narratives and art histories. Museums will have to accept to give up some of their authorial control, if they want to be able to preserve the spirit of new media art.

New media art objects can furthermore change the perception of the art museum profoundly. Museums are constructed as institutions for intellectual enjoyment and the transmission of cultural value. The calm and neutral atmosphere is designed so that the spectator can concentrate undisturbed on the art. The inclusion of new media art object challenges this construction of museum space. Sound, light and movement triggered in the interaction will have to be dammed in, or the museum has to accept the transformation into animated places, where cognitive and sensual experience merge.

Although the inclusion of new media art into the museum environment is challenging for the museum and not always, it can be beneficial for both, the museum institution and the new media artists. Most art museum provide an infrastructure that alternative new media platforms do not yet provide, including funds for the acquisition, promotion and conservation of art, as well as the exhibition and mediation of art on a year around basis. Because of its ephemeral characteristic much new media art is in the peril of being lost if not taken care. In opposition to new media art platforms, the preservation of the works is a major consideration in the art museum.

Furthermore, even though alternative platforms are well established in the new media community, the art museum have the possibility to reach people outside of this community. A greater presence in the art museum would give a better visibility to new media art. This visibility can in turn lead to a bigger scientific interest and place new media art in the scope of private collectors. At this moment, the scientific inquiry into new media art is still insufficient, and private new media art collections are practically nonexistent, even though there seems to be a genuine popular interest into this art.

On the other hand, new media art can also be used in order to attract a new audience for the museum. Visitor surveys have shown that new media art exhibition are generally well visited, especially by a public younger than the average museum visitors.

The ontological and structural changes that might be undergone by an art museums in order to be more apt for the exhibition of interactive media can also support the possibility to exhibit much other contemporary art more effectively. As it has been shown in this thesis, the characteristics of new media art are shared by other art practices, equally challenging for the museum. Furthermore, because of the increasing influence new communication technologies have on our everyday life, it can be expected that the use of new media technologies will increase in the art practice. Hence, the efforts made in order to be able to exhibit new media art can be seen as an investment that will help prepare the museum for the requirements of art

in the future.

The adaptations necessary for the exhibition of new media art do not only include changes in the infrastructure of the museum, like the availability of electricity and an internet connection all over the museum space and the flexibility of the space itself, but also in the methods for the documentation and preservation of the works and the way it is generally thought about the fixed object-hood of art. In order to find adequate standards for the handling of variable media, not only new media art, but also other ephemeral, or time based media a jet greater collaboration between museums, scientists and art historians is necessary. Some museums already created networks and founded collaborations, the Variable Media Network being the most prominent example.

Museums as inherently conservative institutions are often inclined to hold on to their values and functions. However, the constantly changing art practice demands for more flexibility and a greater adaptability also in the practice of presenting and contextualizing art. Museums that refuse to go with the pace of time will find themselves outmoded. In order to remain relevant, museums will constantly have to be renewed, rethink their methods and question the permeability of their collections. The methods of the museum will have to be tested continuously against the contemporary art practice and adapted consequently. Therefore an ongoing observation and critical inquiry is indispensable.

Appendix

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II. Illustrations

- Figure 1: Jeffrey Shaw, Dirk Groenewald, Gideon May, Lothar Schmitt & Huib Nelissen, *The Legible City* (1988-1991), interactive installation, projector, modified bicycle, LCD-flatscreen, SGI Maximum Impact, personal computer, real-time graphic system, self developed software. Installation view, ZKM, Karlsruhe. In Shaw, J. (n.d.). jeffrey-shaw.net. Retrieved November 29, 2014, from <http://www.jeffrey-shaw.net/>
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- Figure 4: Nicolai, C., *Grid Index* (2009), Berlin: Gestalten. In Gestalten Verlag Homepage. (n.d.). Retrieved December 4, 2014, from <http://shop.gestalten.com/>
- Figure 6: Graham Weinbren & Roberta Friedman, *The Erl King* (1982-85), interactive video installation, filmstill. In The Daniel Langlois Foundation. (n.d.). Retrieved December 4, 2014, from <http://dig.do/fondation-langlois.org>
- Figure 5: Graham Weinbren & Roberta Friedman, *The Erl King* (1982-85), 1982-85 version, SMC-70 computer, CP/M operating system, custom build video switcher, three laser disc players, Carroll touch screen, one CRT viewing monitor, one CRT touch screen monitor, three laser discs. Installation view, Solomon R. Guggenheim Museum, New York, *Seeing Double*, 2004. In Grahame Weinbren. (n.d.). Retrieved December 4, 2014, from <http://grahamweinbren.net/>
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