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THE EMBODIMENT OF CODE

What is the Central Idea?

Two different levels must be distinguished with regard to the question of the presentation, the collection, and the preservation of digital works of art. The one level concerns the level of the code, which is binary and in itself completely lacks any meaning. It can become an image, sound, text, or a film. The other level is the level of the interpretation of this code. It is produced using a complex mechanical apparatus consisting of hardware, operating system, and software, which interprets the code and thus allows it to be presented.

Embodiment

The second thesis is that in order to be able to be manifestly understood and be given meaning, digital code always has to possess a specific embodiment. Code without embodiment is like a text that is not read. An analogy to the theater may serve to elucidate this relationship. On the one hand there are the printed lines of a drama, and on the other hand there is the performance of these lines by an actor. The performance takes place at a specific location at a specific time and is done by a specific person. At first, Hamlet, the Prince of Denmark, is only a text. It is not until it is staged by an actor that this text is performed. However, the actor in this performance only embodies the Prince of Denmark. He is not Hamlet himself. He only embodies and plays text. This example makes it clear that the same text can be embodied by a variety of possible actors—fat ones, thin ones, tall ones, short ones, healthy ones, and sickly ones. And one cannot even say which of these many actors is the "true" or "real" enactment of Hamlet. Rather, one can only say that there are many different possible embodiments and performances.

The same thing applies for digital code. It is not until the code has been interpreted by certain hardware and software that it can be represented, presented, and made visible. Therefore one can say that the hardware and software system embodies the digital code, but is not the code itself, just as little as the actor is not Hamlet. One can also extend this argument to the performance of music. What music, theater, and the computer have in common is that they know two completely separate modes of existence: score, lines, or code on the one hand, and orchestra, actor, or software on the other.

The Distinction Between Organization and Structure

In connection with the issue being argued here, it makes sense to distinguish between the organization and the structure of a work of media art. What is the fundamental distinction between organization and structure? If you, for example, consider a business enterprise or an authority, then the business enterprise more often than not has a manager, a managing director and several department heads, various departments, a personnel committee and an employee council, a driver, and a janitor. These abstract hierarchies and positions make up the organization of the respective company. However, it is also clear that these positions can be filled by different persons, who then assume the respective function within this organization. Thus the

director, for example, can be male or female, old or young, have this or that education, speak this or that language. One refers to the concrete embodiment of a particular organization at a particular time at a particular location as the structure of this business enterprise. Structure is therefore embodied organization.

One now sees that the organization of a business enterprise is an abstract, general scheme that can be embodied in a variety of ways by concrete persons, objects, or spaces. We can therefore definitely speak of the concrete embodiment of an organization. One can notice the same difference between these two forms of existence in works of media art. As viewers we can refer to the abstract organization of such a work—that is, to the code—or to its concrete embodiment in the manner in which it is produced by a specific medial structure of hardware and software conditions at a particular location at a particular time. The interpretation of the code by a certain hardware and software causes the performance itself to become a historical event that occurs at a particular location at a particular time and can be observed by particular viewers. Performed and embodied code is therefore always historical. It is present, here and now, all around us.

Notation and Performance

Unlike traditional image media such as paintings or drawings, digital works exist in two completely different forms—the state of notation and the state of performance.

To begin with, video only exists in the form of a notation, which is an analog or digital code on a tape or on a disk. One cannot discern what has been stored onto a magnetic tape or a plastic disk merely by looking at it. In addition, the notation of a video does not, however, consist of only this code, but also of numerous original, material objects. This may seem surprising at first. But there is no form without matter. The code possesses a certain materiality. The specific materiality of a video is already a historical form of embodiment which defines itself through the original image and sound carriers onto which the code has been physically stored. Here, at the level of the material carrier, it also becomes clear that one and the same code may possess many different possible material image and sound carriers, for example VHS, Betamax, Video 2000, U-matic, or Betacam. One therefore cannot say what the "true" or "real" material carrier of a video is, but only that there is a variety of possible carriers, all of which possess certain advantages and disadvantages. In this plurality of material carrier systems one can only indicate which of the original, historical, and authentic image and sound carriers was used to produce the work. This is then very important for its musealization.

Video art exists on a tape or on a disk in the form of its non-substitutable, original, material elements. In contrast, all of the specific components required for the performance of this kind of notation, such as players, monitors, beamers, amplifiers, speakers, computers, operating systems, software, or certain cable

connections, do not belong to the organization of the work. Rather they represent the respective temporary embodiment of the code.

The abstract organization of a work of media art in the form of its notation or installation instructions corresponds with its concrete embodiment in the form of its performance and representation at a particular location at a particular time for particular viewers. An embodied presentation or performance is always already an interpretation of the work. One and the same notation therefore corresponds with many different types of performance and possible interpretations. This difference between notation and presentation is found in all magnetic or digital image and sound recording systems. One cannot discern from the binary numeric code alone what kind of document one is dealing with. To do this one requires the so-called meta-code that is written at the beginning of each binary numeric sequence and describes its interpretation.

Here, too, the form in which data become visible or audible is dependent on the concrete embodiment of the binary ASCII notation. One and the same binary numerical code can be interpreted as an image, a sound, or a text document. The software assumes the role of the curator, the symphony orchestra, or the actor. The sense and meaning of binary numeric columns is therefore dependent on concrete hardware and software, which presents the numeric notation at a particular location at a particular time for a particular viewer. Hardware and software are therefore systems of embodiment, performance, and presentation. They give a concrete, physical body to the abstract organization of data, and this body exists at a particular time at a particular location for a particular viewer.

However, let us linger a moment on the questions and problems associated with the presentation of digital works of art. On the part of hardware components, too, it becomes clear that every exchange or substitution of a hardware component has an influence on the form, meaning, and aesthetic experience of such a work of art. In this respect, perhaps the most important factor to be taken into account are the "mentality" differences in the interpreting software. Impulse frequencies, scanning rates, and temporal access speeds may likewise

be responsible for enormous differences in the performance, but they do not create such serious differences in the embodiment. Context effects result from substituting the operating system as well. Windows, Apple Macintosh, and UNIX are in principle the three large operating systems that fundamentally influence the appearance, the form, and the behavior of software. Added to this are the various operating system versions, which cause different appearance, function, and performance.

The Embodiment of Video

If one goes all the way back to the beginning of the production of a video, one notices that the production of image and sound is to a large extent dependent on the respective medial apparatus used to produce the video. This begins with the recording camera used, the optical system, and the way in which with the aid of a vidicon tube or a light-sensitive chip the incident, color structured light is converted into an electric signal, which in turn is stored on an analog or on a digital storage medium. The decisive parameters of the image recording and the image representation are first of all lens system, conversion, and the form of storage. Up to this point it is already discernible that the concrete embodiment of image and sound in the form of a recorded image and sound format is always dependent on the respective medial apparatus used to produce the video. Thus it is also always historical. The medial apparatus that produces the concrete embodiment of code is the actual proof for the originality of the material object, the image, and sound carrier.

The medial apparatus or the medial dispositive is therefore the decisive factor in the question regarding the embodiment of code. There are two different medial arrangements or apparatuses. The one medial apparatus is the historical one. It is the apparatus with which the video was made at a particular time at a particular location. This historical, technical-medial arrangement has entered the work **as form.** This historical technology that was available to the author when he produced his work has left its mark on the organization of the work. It can be construed from the form of the image and the sound. It has become a feature of the work that defines its originality as direct, authentic evidence of its historical origin.

This historical, medial apparatus, however, is also confronted by a second medial arrangement, which I would like to call the current dispositive of presentation, performance, and enactment The range of our cultural heritage and our (current) treatment of (historical) forms and objects lies in the tension between the historical apparatus of production and the current apparatus of medial presentation, performance, and enactment.

During the production of the video, the historical dispositive of the medial layout has left its mark on the organization of the work as its form. One can recognize, describe, and interpret its historicity by this. In the analysis and interpretation of the form of a work we describe its historicity, its time restriction, and its embeddedness in certain intellectual, cultural, economic, or social currents of its period of origin, of which it is an expression. This is essentially the point of view taken by Erwin Panofsky's iconology. Form is the historical embodiment of code.

However, the current dispositive of medial arrangement is always contemporary. It is always current, always here and now, always there, always all around us, always present. This is the reason we do not notice it. Borrowing a term coined by the American perception psychologist James Jerome Gibson, one could also speak of a surrounding medial layout. It is the current embodiment of code in the form of its performance, its presentation, or its enactment.

The Performance of Videos
Thus it immediately becomes clear that there can be very many different ways of presenting one and the same video. This is due to the specific materiality of the media systems involved. But not only because of this. The location as well and its associated spatial, visual, acoustic, institutional, cultural, and economic conditions exercise a significant influence on the appearance, embodiment, and meaning of the same video.

What does it actually mean when one speaks of "the same" video? In what sense does this manner of speaking even make sense? If I am referring to a concrete material object such as the mini digital videotape I am holding in my left hand, then I can reproduce the work embodied in this mini digital video in very different

medial arrangements. Each time, the concrete appearance or presence of the played-back tape is another one, a presentation or performance embodied in another way.

But it cannot be said which performance of a video the "true" or "real" one is, rather only that there are many different possible types of performance. If one slightly alters a famous statement made by the American philosopher Nelson Goodman, one could say the following: There is not the way a video is, but there are many ways.

These differences and shifts in the concrete embodiment of the medial apparatus go unnoticed in current performance situations. They remain the latent background structure of the aesthetic experience. It is not until one makes a specific methodical comparison of the overall medial apparatus with a systematic variation of the individual variables that the resulting differences become observable in the presence, appearance, and embodiment of the work.

Collecting
What does it mean to collect videos and preserve them for posterity? It is obvious that we cannot preserve everything there is for posterity. Therefore a selection must be made out of the diversity of videotapes in order for future generations to be able to get an exemplary idea of them. In doing so, the works to be preserved will not be selected as pieces of material evidence of video art as it once was, but as evidence, documents, and representatives of significant social and cultural values. This is why in their museal enactment they do not appear as purposeless "things as such," but rather as relevant "things for us," as interfaces to the knowledge about and understanding of our culture, our history, and our society.

Actively collecting works of video art is the first step towards their preservation. Those works from the wealth and diversity of video art should be collected which possess significant cultural value, whose preservation and memory lie in the interest of society. This is why active collecting is better than random, contingent selection. Cultural heritage should be consciously and specifically appropriated and preserved. Precise and

explicit collection guidelines therefore need to be developed.

But what does that mean? A work of video art that represents significant cultural value and whose preservation and memory lie in the interest of society? It becomes obvious here that the notions of collecting, cultural significance, and preservation for posterity are highly charged and ideological concepts. For this reason they can, of course, be easily criticized from any other ideological standpoint. But it must be clearly stated that in this matter there is no neutral position free of ideology. For this reason there is also no morally superior position. The only chance consists in becoming aware of the ideological implication of collecting and musealizing, explicitly disclosing the decisions and the underlying ideology of collecting as such, and justifying them by way of discursive argumentation.

Preserving and Conserving

Let us now turn to questions concerning the preservation of digital code for posterity. Unfortunately, the aging process cannot be halted, something we notice daily on our own bodies. It can only be slowed down artificially. The restorer is therefore an anti-aging specialist. Thus the question is: How can one slow down physical aging? This is an applied science. One can either actively slow down the aging process by influencing the material object itself, or one can passively slow it down by influencing its environmental conditions. This primarily includes the control of light, temperature, humidity, dust, or magnetic fields.

Conservation, too, is highly ideological. To a large extent it is dependent on the respective *Zeitgeist*. Above all, however, it depends on the technical knowledge about the processes that lead to the degradation of the medium. Both that once undertaken for the preservation of a work is determined by the *Zeitgeist* as is that which was not undertaken. This inevitably means that even the strategies for the preservation and conservation of digital code are dependent on the prevailing *Zeitgeist* and on prevailing ideologies, and that they will also continue to change in the future.

For myself as a non-restorer, the history and theory of restoration appear to be a history of failure, of

misunderstandings, and of making errors. This is why I deeply mistrust any ideology of conservation and any well-meant pieces of advice. Dietrich Dörner's book *Die Logik des Misslingens* (The Logic of Failure)[1] should be mandatory reading in every introductory course on the ethics of restoration. The following historical example perhaps serves to illustrate the reason for my mistrust.

In 1979, Gerhard Lechenauer wrote the following passage in his book *Video machen* (Making Videos):

Compared to rolls of film, it is relatively unproblematic to store videotapes. Their electric features do not change over time. Film material changes despite its being stored in air-conditioned rooms. The most serious factor to be mentioned is the fading of colors. The frequent video system changes in recent years (with the exception of two-inch studio technology) makes the decision for a video archive system very difficult; the transfer of old video recordings to new systems will often be inevitable. It is possible that in the future, a favorable change will emerge in the one-inch sector. The Robert Bosch company has released the reproduction rights to its one-inch video system (Quadruplex). Based on the lower costs for the one-inch magnetic tape with a higher-quality image, this format is particularly interesting for archiving purposes.[2]

In retrospect, the author succumbed to a cannonball of a false estimation. But are we better off today? For me it would be more interesting to ask which strategies and modes of thinking regarding the future of long-term archiving one should or could have applied in 1979 in order to find out where the journey will be headed in this sector over the next twenty-five years. Trend researchers and futurologists such as Matthias Horx or Peter Wippemann would seem to be the right people to contact in this respect. After all, in 1979 VHS had already been available for two years, and Sony's Betamax for one. Gerhard Lechenauer certainly knew nothing about CD-ROMs and DVDs in 1979, although theoretically he could have already been slightly familiar with the CD, as it had been developed in the 1970s. But

1   Dietrich Dörner, *Die Logik des Misslingens: strategisches Denken in komplexen Situationen* (Reinbek bei Hamburg, 1989).
2   Gerhard Lechenauer, *Video machen* (Reinbek bei Hamburg, 1979).

wouldn't it have been much more interesting in 1979 to have taken the reverse path and to have exposed important videos to film material, which from today's point of view seems to be considerably and more lastingly durable? Despite my criminally foolish storage methods, my first normal-eight experimental film from 1969 still possesses superior sharpness and color quality. In retrospect I would have to say that it was a good thing I worked with film at the time and not with video.

In any case, I have the suspicion that the latest innovations in this area are time and again regarded as cure-alls for all of our unsolved preservation problems. Currently, all hopes with respect to long-term archiving are being pinned on DVDs and the open-source formats. But it could very quickly become unfashionable to write a new patch or a new driver for Linux. We have finally arrived at a point which the nearly ninety-year-old historian Eric Hobsbawm several years ago clothed in the question: Can one learn something for the future out of the past? Regardless of what one's principle view is on this question, I consider it worthwhile attempting to think about how one might bring a few good answers for future strategies for the preservation and conservation of video art out of the numerous historically recurring patterns of expectations, states of euphoria, and disappointments.