CLICKING IN
HOT LINKS TO A DIGITAL CULTURE

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FROM PARTICIPATION TO INTERACTION
Toward the Origins of Interactive Art
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Bay Press
Seattle
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Similar to video and performance art, interactive art developed mainly outside traditional art institutions such as galleries and museums. The forums of interactive art are above all media art festivals, where in the late eighties it became a fixture. The development of an independent organization shows that media art, especially interactive art, transcends the borders of art genres that are based on art theory. The mimetic strategies of interactive art do not aim primarily at visual qualities; rather, the dialogue between program and user constitutes the artistic material. As far as viewer participation is concerned, interactive art follows the avant-garde traditions of the beginning of this century, traditions that reacted to the widening gap between the mass audience and the art audience.¹

THE CLASSICAL AVANT-GARDE

In Futurist performances and manifestos audience participation was an implicit or explicit means to reduce the distance between performer and audience—either by spatial integration or by provocative addresses. In the manifesto Variety Theater of 1913 Filippo Tommaso Marinetti made several suggestions concerning the physical involvement of the audience: “The Variety Theater is alone in seeking the audience’s collaboration. It doesn’t remain static like a stupid voyeur, but joins noisily in the action, in the singing, accompanying the orchestra, communicating with the actors in surprising actions and bizarre dialogues.”²

Whereas the Futurists limited their call for participation mainly to stagelike performances, in 1920 Max Ernst introduced the possibility of audience participation in exhibitions. At the second Dada exhibition in the backyard of the Brauhaus Winter in Cologne, where works by Max Ernst, Jean Arp, and Johannes Theodor Baargeld were
shown, Ernst placed an ax next to one of his works, to be used by the visitors in case they did not like the object. Using the ax, which was meant to provoke the audience into actively stating its opinions, remained an imaginary possibility, since the object elicited the trained response of detached contemplation. There was another explicit invitation in this exhibition to intervene in the presentation of a work which the visitors actually made use of. A critic for the Kölnische Volkszeitung wrote: “One of the incomprehensible ‘drawings’ left a lot of space on the paper and beneath it are written the words: ‘Any visitor of this exhibition is entitled to insert a Dadaistic or anti-Dadaistic aphorism in this drawing. No prosecution.’”

In 1938 Marcel Duchamp developed and reinterpreted Ernst’s challenge to the audience. In the exhibition Exposition internationale du surréalisme, in the Galerie des Beaux-Arts in Paris, he wanted to illuminate the paintings with a light that would only switch itself on when the visitors activated a light sensor. The organizers—including André Breton, Paul Éluard, Salvador Dali, Max Ernst, and Man Ray as “illuminator in chief”—eventually had to abandon this project because of technical difficulties; however, they provided the visitors with lamps so that they could illuminate the paintings themselves. After all the lamps were stolen, the organizers returned to traditional illumination.

In the end Duchamp’s staging left the “envisioning” of images to the viewer. Like Max Ernst, Duchamp put in perspective the active role of the artist as well as the status of the “sacrosanct” work of art. Unlike Ernst, however, Duchamp placed the main emphasis on the technical transfer of perception, which he further developed in his Rotoreliefs: though the spatial image of the spiral completes itself in the viewer’s perception, the activity that makes this perceptual process possible is not performed solely by the beholder but also by the motion of the Rotorelief. Artist and artwork share their former authoritative position not only with the beholder but with the machinery as well, which in the end is the precondition for the altered perception. This is the reason why some of the artists who worked on the interplay of “art and technology” in the sixties took Duchamp as their paragon. Duchamp himself had a rather indifferent attitude toward the role given to him. “They [the artists who work with technological systems] have to get somebody as progenitor so as not to
look as though they invent all by themselves. Makes a better package. But technology: art will be sunk or drowned by technology."

HAPPENINGS

In the early fifties John Cage took up Duchamp’s ready-made concept and separated it from its object fixation. This was accomplished not only by a transformation into sound processes but also by transferring responsibility to the viewer. In Cage’s case, however, the spectator’s responsibility is not linked to an active participation. Here Cage’s events and the later Fluxus events, which often took place in a stage-like situation, differ from the Happenings of Allan Kaprow, who was a student of Cage at the New School for Social Research in New York. By presenting Happenings in garages, in the streets, or in shops, Kaprow (and also Wolf Vostell) abolished the exclusivity of the usual exhibition venues in the sixties. Although Kaprow chose the term “Happening” to avoid any connotation with the world of art, the press and some New York galleries still regarded Happenings as a new form of art. Thus they contributed, like Duchamp’s ready-mades, to the reinterpretation and extension in form of the concept of art, not to its abolishment.

The redefinition of the audience in Happenings and participatory art forms has led some authors to seek the traditions of interactive art there. Regina Cornwell draws a plausible line from exemplary work of Allan Kaprow (Happening) via that of Robert Rauschenberg (reactive environment), Yoko Ono (participatory event), and Valie Export (closed-circuit installation) to interactive art, but she does not elaborate the differences. Erkki Huhtamo, too, sees the roots of interactive art in the participatory art of the sixties: “The roots of interactive media art are to be found in the 1960’s. . . . The expansion of the traditional field of art, the dream about ‘Total Art,’ the annihilation of the barrier between life and art, the ‘dematerialization of the art object’ (Lucy Lippard), process art, participation art, concept art, Fluxus, the Happening movement and Situationism, ‘Art and Technology,’ kinetic art, ‘cybernetic art’ (Jack Burnham), closed-circuit video installations—these phenomena may be heterogeneous, but they are part of one and the same process which had a profound effect on the relationship between art and its audience.”
The references to participatory art forms of the late fifties and sixties are not only to be found in the history of art, they are also reflected in the biographies of some interactive artists: in the oeuvre of Jeffrey Shaw and Lynn Hershman Leeson, interactive works have their origins in participatory art forms like performances, Happenings, and site-specific works. This development characterizes the oeuvre of Peter Weibel and Bill Seaman as well. However, the technology-oriented method of Myron Krueger and David Rokeby as well as video art have equally important significance for the development of interactive art and constitute evidence for a heterogeneity of approach rather than for a homogeneous tradition.

The linear tradition postulated by Regina Cornwell, Erkki Huhtamo, and other authors must be differentiated, as it does not allow detailed statements about the characteristics of interactive art—characteristics that spring from parallels with other art forms but especially from the differences. It is primarily the differences that show the significance of interactivity for contemporary culture. Therefore, in the following discussion the decisive developments toward interactive art will be examined not only for parallels but for qualitative inconsistencies.

Audience participation is the essential criterion for the comparability of interactive art and art of the sixties. Allan Kaprow is considered an important exponent of participation efforts. He defined Happenings as big “environment-like, non-theatrical exhibitions that turn to the public in an increased degree.” In his solo exhibition in New York’s Hansa Gallery in 1958 visitors could explore a mazelike room while being confronted with unexpected things. However, the audience’s possibilities of intervening in his Happenings remained limited. Johannes Schröder summed up in his analysis of *The Spring Happening*: “Under this condition [of absolute control by the organizer] the Happening does not seem to be a step toward viewer participation, but a precisely elaborated artistic act that guarantees the integration of the participants as a material.” Neither in Cage’s “idea” Happenings nor in most of Kaprow’s “participation” Happenings did the participation of an unprepared audience take place. Instructions or scripts (even minimal ones) were always present and controlled the performers’ behavior. Happenings that refrain from explicit instructions have been realized in Europe chiefly in politically motivated street actions.
Kaprow's Happenings make abundantly clear that not every form of participation per se implies a higher responsibility for the visitor and thus a less authoritarian role of the artist. Rather, participation is located along a fragile border between emancipatory act and manipulation. The decisive factor in judging the receptive situation is how active the unprepared viewer becomes within a certain framework of action and without specific instructions. Furthermore, it is important to differentiate between nontechnical participation and technically mediated participation. At about the same time as Happenings, reactive kinetic art evolved, replacing instructions given by the leader of the Happening with technically communicated and pre-programmed participation.

Cyborg Art

The employment of partly simple, partly complex technical strategies in the mid-sixties allowed the development of an art form generally described as "reactive," "cybernetic," or "responsive." Its origins, however, go back to the fifties. Norbert Wiener's popular description of cybernetics, in which he made his 1948 theory available to a larger audience, apparently had a strong influence on the development of reactive art and its theory. After Roy Ascott in 1966 showed the implications of an art concept shaped by cybernetics, Jack Burnham introduced the term "cyborg art" into art theory discussions two years later. He used this term to describe electromechanical systems with a lifelike behavior as well as man-machine systems that take on some of the features of biological organisms by means of feedback.

In cooperation with the composer Pierre Henry and the Philips Company, Nicolas Schöffer produced as early as 1954 a "cybernetic sculpture," which belongs to the first group defined by Burnham. It produces sound, dependent upon environmental influences, but the relation between cause and effect remains deliberately uncertain. Two years later CYSP I (cybernetic-spatiodynamic) was created, a "timid" sculpture that becomes active in darkness and silence, and remains motionless in brightness and noise. Unlike Schöffer's first sculpture, CYSP I shows a causal connection between stimulation and reaction. Thus a personality, a sort of being, is attributed to the sculpture. In CYSP I this anthropomorphization—determined in traditional sculpture by visual mimetic processes—is shifted to the sculpture's ability to react, which is anchored in its program.
The series of "cysp" sculptures, created in the following years, is only one element in Schöffer’s conception of the impact of technology on society. The plans for a cybernetic city, presented in 1965 in a joint exhibition of Schöffer and Jean Tinguely at the Jewish Museum in New York, demonstrated that for Schöffer the ability to program not only sculpture but the whole urban area offers the chance to create a dialogue between technology and environment. With Schöffer, however, the historically rooted antagonism between nature and technology is strangely paradoxical: the development of technology appears to be predetermined and capable of being influenced at the same time. This paradox constitutes a fundamental conflict within the technology discussion of postindustrial societies.

**ART AND TECHNOLOGY IN NEW YORK**

The fundamentally optimistic attitude toward technology shaped both reactive art and the American movement of Art and Technology in the late sixties, thus continuing the traditions of the Russian Constructivists, the Italian Futurists, and the Bauhaus artists. In the sixties as well as the twenties, these attempts at a reunion of art and technology, however heterogeneous they may have been in their respective attitudes, all aimed at renewal of art. The modern progressive technology was played off against an antiquated, manually produced art. In 1967 Rauschenberg stated provocatively, when Henry Liebermann of the *New York Times* asked him the reason for his commitment to the Art and Technology movement: "If you don't accept technology, you better go to another place because no place here is safe. . . . Nobody wants to paint rotten oranges anymore." Most important is the notion that an art that excludes modern technologies will lose its social relevance. In the sixties technology was used provocatively against an art establishment that clung to an object-oriented and handicraft art. A glorification of technology, as came about in the Constructivist and Futurist art of the twenties, was almost nonexistent in the sixties. It was replaced by the realization of cooperation between artists and engineers, with the aim of promoting their mutual understanding.

After Robert Rauschenberg met the engineer Johan Wilhelm (Billy) Klüver in 1960 during his preparations for Jean Tinguely's self-destroying machine *Hommage à New York*, a close cooperation between
the two developed. John Cage, who worked with Rauschenberg as early as 1952 at his Black Mountain College event—the forerunner of the Happening—also cooperated with Klüver. In the performance *Variations V* (1965) Cage and Merce Cunningham employed a sound system by Klüver that reacted via photoelectric cells and microphones to sounds, to the movements of dancers, and to the projections of a film by Stan Vanderbeek and video images by Nam June Paik. By using the system in such a way, the functional principle of computer-controlled interaction between live actions and sound effects—to be used artistically only later—had been anticipated.

**Nine Evenings: Theater and Engineering**

One year later the opportunity arose to develop these projects further. Ten New York artists—among them John Cage, Merce Cunningham, Lucinda Childs, Deborah Hay, Robert Rauschenberg—prepared a contribution to the Stockholm Festival of Art and Technology. Although in the end the artists did not participate in the Stockholm event, they created a series of performances that were held in October 1966 in the Armory Hall under the title *Nine Evenings: Theater and Engineering.* A wireless system was the central technical element of the events. This system was composed of transportable electronic units that could function without cables and be operated by remote control. Cage used the wireless system for switching on and off loudspeakers, which reacted to movement via photocells. In *Variations VII* (1966) Cage also used contact microphones, making body functions that normally cannot be heard—like heartbeat and noises from the stomach and lungs—audible. Apart from the wireless system Cage used 20 radios, 2 television monitors, and 15 telephones around which the performers moved.

The performances of *Nine Evenings* presented not only the principle of auditory feedback but that of visual feedback as well. The visual closed-circuit principle—which at that time had been barely claimed for artistic use—was employed after Rauschenberg's performance *Open Score (Bong).* Five hundred people were on a stage in utter darkness, performing simple actions. Their image was recorded by infrared cameras and projected on a screen so that the audience could reconstruct the situation on the stage only on the basis of the projected image. When the light went on again, the actors had disappeared.
THE REACTIVE ENVIRONMENT

While Cage in *Variations V* and *Variations VII*—which led to the subsequent interactive performances—kept to a performance without audience participation, in 1968 Rauschenberg developed a visual reactive environment that involved the nonspecialist, unprepared visitor. Rauschenberg conceived *Soundings* in close collaboration with the engineers of EAT (Experiments in Art and Technology), a New York–based organization he founded with Billy Klüver in 1967 to support interdisciplinary projects between artists and engineers.

*Soundings* consisted of three sheets of Plexiglas, placed one after the other. The front sheet (approximately 11 by 2.5 centimeters) had a mirror on one side, and the two smaller sheets presented different silkscreened views of a chair. If visitors kept quiet in the exhibition space they would only see their mirror images—an effect that also plays a part in Rauschenberg’s *White Paintings*. But as soon as somebody spoke or made a noise, lights were activated that made visible different views of the chair. This effect was described by Robby Robinson, who worked on *Soundings* together with Rauschenberg: “We started to tune the circuits, and then I saw the effect he was after, these chairs tumbling around in a random way... in an optical illusion.” The visible image of the chair varied according to the pitch of the voice or the noise.

While Happenings imply a stage situation and are bound to a fixed, limited performance time, reactive environments address the exhibition situation in galleries and museums. They assume that an unprepared visitor will move through the exhibition space with heightened attention. Although *Soundings* distinguished itself from other environments by the fact that it did not occupy a whole room, it can still be described as “environmental,” because it opened up to the visitor by its ability to react. With the technically conveyed involvement of visitors in a visual and/or auditory electronic process within the context of an exhibition space (museum, gallery, or festival), the essential preconditions for interactive environments and installations have been created. A series of works created in the mid-sixties that allowed for different kinds of viewer participation can be divided into reactive environments, reactive sculptures (cybernetic sculptures), and their intermediate forms. Of the latter, Rauschenberg’s *Soundings* blazed the trail for the subsequent development of interac-
tive environments, because unprepared visitors were involved in a dialogue-like relation by means of hidden technological devices.

Another important factor for the development of interactive art is the principle of the visual closed-circuit installation, which was introduced in the late sixties not only at stage performances such as *Nine Evenings* but also in the context of exhibitions.

**Closed-Circuit Installations**

Two closed-circuit installations could be seen in the first video group exhibition, *TV as a Creative Medium*, in New York’s Howard Wise Gallery in 1969: *Participation TV II* (1969) by Nam June Paik and *Wipe Cycle* (1969) by Ira Schneider and Frank Gillette.²⁴ Paik started to experiment with the functions of the TV set as sculptural material in the early sixties. Together with engineers he developed modulations that created nonrepresentational electronic images and used sound waves to change the images on the monitor.²⁵ Those attempts led to *Participation TV I* (1963–66), in which visitors talked into two microphones or produced other sounds and subsequently watched the effects of the sound waves on the monitor.

In *Participation TV II* Paik used visual feedback. The work consisted of three or four color monitors and three cameras aimed at a monitor, resulting in an endless feedback. If visitors stepped between camera and monitor their images appeared on the monitor as colored, overlapping, almost abstract shapes. *Participation TV II* reflected on the principle of feedback in its original technical meaning, that is, part of the original impulse was returned to affect the further course of events. *Participation TV II* did not serve the self-reflection of visitors, since in contrast to other closed-circuits they were not “reflected” on the monitor. Instead, their images were refracted and distorted by the effects of the feedback. As soon as visitors stepped between camera and monitor they saw their outlines from behind, seemingly fading away in the endlessly scaled space of the feedback image.

While Paik’s *Participation TV II* made visible the entry of the visitor into the closed-circuit arrangement as a feedback effect on the monitor, thus illustrating the unity of the technical cycle, *Wipe Cycle* by Frank Gillette and Ira Schneider confronted visitors with their own images “on television.” On nine monitors the recorded images of visitors were juxtaposed with images from a TV program, previously
recorded footage, and time-delayed live images. Taken to the center of the nine monitors the (TV) viewers became aware that they were elements of recordings of varied and partly nonreconstructable origin and temporality.

In closed-circuit installations visitors are often unintentionally or at least unconsciously confronted with images of themselves on a monitor. The use of cameras implies at the same time the possibility of being observed by others. This situation causes a tension between uncertainty and exhibitionism. The visitor can either get away from this situation and leave the visual field covered by the camera or accept the new context. In both cases the possibility of intervention or action is limited. Closed-circuit installations are not so much about providing the visitors with the opportunity to act creatively but about showing them their situation within a system determined by automated surveillance technology.

**REVIEW: COMPARISON OF RECEPTION SITUATIONS**

The connections between Happenings, reactive art, closed-circuit installations, and interactive art result primarily from their intermediary nature. Dick Higgins uses the term “intermedia” to describe artistic forms of expression that cannot be attributed to a certain genre. In contrast to Happenings, which are defined by their distance from dramatic performances of the classical theater and are sometimes characterized as “new theater,” interactive art does not have any direct forerunners in the traditional art genres. Its precursors are rather those forms that already follow the enlarged notion of art in the twentieth century and are directed against the established art system.

The involvement of the audience in interactive art goes beyond the approach of the “classic” New York Happenings. The visitors are not only integrated spacially and addressed “in an increased degree” (Kaprow), but they are involved in a close dialogical relation. This dialogue constitutes the artistic material. Similar to Happenings, the free space that the program allows the users-players will vary.

In interactive art the artist only rarely takes on the leadership of the event, as is the case in most Happenings. The interactive system takes the place of the authorial leader. Conceptually, the artist delegates his role to the program and withdraws from the action. The
receiver later realizes the program. In this way the plot directions of
the classic Happening, written down or passed on verbally, will be
automatized. The introduction of technical means of control in art
marks a turning point in the participatory Happening and perfor-
mance art because it is the precondition for the automatization of
participation. First steps toward this automatization were already
made by Duchamp's Rotoreliefs, reactive art, and the closed-circuit
installations.

Happenings and performances are generally characterized by
the impulse of bringing art and life closer together, and this funda-
mental approach also applies to interactive art, even though there is
a significant difference with an inherent shift of meaning: "life" is not
primarily associated with human substantiality or with the immediate
experience of everyday life; it is linked to media-based, automated
events. The programmatic fight against the alienation of art from
everyday life was a central topic of the late sixties. Happenings and
performances dealt with a social situation in which new forms of
political participation in decision making were widely discussed.

This situation has now changed. Essential aspects of social life
no longer take place in the urban space. Thus street action only has
a limited public effect. Instead, essential aspects of work and leisure
have shifted to communication with and by electronic and digital
media. Interactive art discusses the arising social manners formed by
digital technology. It transfers aspects of technology-dominated daily
life to internal concepts of art. The motto "art and life" is being trans-
formed into "art and technology." This process of transformation
started in the sixties, and it has reached a peak today with the terms
"life" and "technology" becoming increasingly congruent.

The widespread judgment that interactive intercourse with com-
puter systems prepares the ground for an emancipation from the
media context, via the development from "passive" to "active" recep-
tion, is being euphorically defended by referring to the participatory
art of the sixties. But the role of the performers and the leader of
Happenings has also shown that neither the authoritative role of the
artist nor the notion of work has been abandoned completely. These
concepts will remain a principle in interactive art, too. They are dele-
gated to the program and automatized. The artistic material of inter-
active art is the automatized dialogue between program and user.
Interactive artworks provide a critical analysis of the automatized communication that is replacing interhuman relationships in more and more social fields. Thus the distribution of power between user and system is not just a technological issue but a social and political one as well.