Understanding "Open Work" in Interactive Art

by

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ABSTRACT

This paper concerns Umberto Eco's "open work" as a methodology for Interactive Art. I examine open work in its original social and cultural contexts, and probe its potential as a methodology.

Eco's "open work" is concerned with the process of making of art rather than with any finished artwork. He posits two components of open work: a multiplicity of meanings, and audience participation. In open work, artists create artwork in a way that allows the audience to construct multiple meanings. This is a contingent process, and the degree of openness is the measure of its contingency.

Interactive Art's digital technology makes open work a promising methodology, but this requires two layers of openness: contemplative (Ecos's concept) and structural (a specific quality of Interactive Art). And finally, open work can use computing as a creative process and can enhance the artistic goals of community and play.

Keywords: Open work, Umberto Eco, Audience participation, Interactive art, Digital media

DEDICATION

To my mother

ACKNOWLEDGEMENTS

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INTRODUCTION

Making art is a way for artists to communicate with audiences. Just as in other forms of communication, making art can be studied and analyzed to a certain degree. This paper concerns the making of meaning in artistic production, not general art theory or art history. Specifically, it deals with making works of Interactive Art recent art history.

Interactive Art is a relatively new field, and its theoretical framework has not yet been constructed on solid ground. Quite a number of artists and theorists have been attempting to build legitimate discourse around the subject, and I hope this paper will contribute to that effort.

In this paper, I propose Umberto Eco's idea of "open work" as a useful approach to making art in Interactive Art. I examine his understanding of open work in its original social and cultural contexts, and its potential as an artistic methodology in the Interactive Arts. The paper explores artistic intentions and motivation in Eco's notion of "open work," and makes linkages between those intentions and the technical processes in the production of interactive artwork.

Eco analyzed the modes of art of the early half of the 20th century and summed up his study in his book, The Open Work. His idea of "open work" arose in the context of certain avant-garde art movements of the early and mid-20th Century, such as the Situationist International, Fluxus, Happenings, electronic theatre, the Living Theater, and many others, and has some resonance with much contemporary art.

Eco's "open work" refers to methodologies of communication in art. It concentrates on an artist's decisions regarding the delivery of meaning to an audience. Eco presupposes two components in the creation of open artwork: multiplicity of meanings, and audience participation in the making of art. In practice, an artist creates artwork in a way that generates multiple meanings, and the audience helps to construct the different meanings. This requires a contingent, improvisational process, allowing the audience to participate and the artwork to change. With digital technology, artists in Interactive Art can have the art change physically, in direct response to an audience action (stimulus). Accordingly, much interactive artwork involves live performance and web art which are in a mode of constant change. The contingent process itself is how this particular type of artwork operates.

While Eco is concerned with both the methodological and aesthetic attributes of open work, this paper focuses on the methodological attribute. I concentrate on establishing a framework for Interactive Art; the aesthetic attribute of open work should be dealt with in a different study. The problem of aesthetics cannot be fully comprehended with methodological knowledge alone. However, a suitable method will provide a better chance of achieving the ultimate purpose of aesthetics. I propose that Eco's "open work" is a suitable method for Interactive Art.

I start with three key questions: what is open work, why is open work important for Interactive Art, and how can we apply open work to Interactive Art? The first chapter is devoted to understanding Eco's ideas of open work. The second chapter develops these ideas further in conjunction with another idea, the "degree of openness," from Italo Calvino's book, Six Memos for the Next Millennium. In the third chapter, the historical and cultural backgrounds of open work are elucidated in association with the Interactive Arts. The forth chapter focuses on the characteristics of Interactive Art that relate to Eco's "open work," and on the modification of open work for possible use in Interactive Art. In the fifth chapter, a new definition of open work will be discussed in terms of Interactive Art. Eco's "open work" is based on older avant-garde ideas, and it needs to be re-interpreted to reflect contemporary art practice.

While Eco's "open work" seems to be a promising framework for Interactive Art practice, applying his "open work" to Interactive Art requires some modifications of the original concepts. For example, while Eco mainly deals with multiple possibilities of meaning through contemplative understanding, my use of open work operates with an audience's active involvement in the structural level of the artwork as well as with their contemplative understanding.

In both situations, the degree of "openness" is a key criterion in defining the relationships between artwork and audience or performer and device (Calvino Six Memos). At the extremes, an artist can make art in a restricted way, so the degree of openness is low and the possibilities of artistic events are small; or they can make the work so that it provokes diverse outcomes to the point of being white noise, so the audience cannot make sense out of it. I want to find the strategies for arriving at the optimum.

A large part of my thesis concerns finding an optimum degree of openness in artwork as a methodology. My understanding of Eco's "open work" relates to how much openness to use, and how the artist can find the optimum degree of openness to best reach her audiences. The new definitions of open work in Interactive Art are hypotheses, and require extended research to demonstrate their successful applications to the process of making art. This paper is meant to establish an initial mapping for future projects of open work in Interactive Art.

CHAPTER 1. WHAT IS "OPEN WORK"?

A. Umberto Eco's Definition of Open Work

The term "open work" has a broad range of meanings. First, I will clarify the difference between Eco's meaning of "open work" and a general meaning of "open work." From an audience's perspective, all artwork is, in a sense, open. Interpretation happens at all levels of human perception. Whether we perceive certain meanings in a religious painting from its iconographies, or a Calder mobile through its disparate but interlocking perspectives, different individuals arrive at different understandings of artwork. This general understanding of open work is not contested. Umberto Eco narrates specific conditions for his "open work," and "open work" in this paper explicitly refers to Eco's usage. In The Open Work, Eco defines open work as an artwork in dynamic movement or process without a fixed ending or fixed meaning. By its nature, it promises constant change. It is "work in motion" (opere in movimento) - work which has temporal meaning (i.e., it can change from time to time) or multiple meanings.

Meaning is a crucial concept in open work, but it is not easy to define. It is not the same as "message" or "content." For the purposes of this paper, I define the word "meaning" in a work of art as the functional equivalent of Clive Bell's "significant form" ("Aesthetic Hypothesis" 68). He defines this as an essential quality that all works of visual art share and which gives them aesthetic power. "In each, lines and colours combined in a particular way, certain forms and relations of forms, stir our aesthetic emotions" (68). His notion of "significant form" in visual art can be extended to include artistic intention and artistic vision in all artwork. The artist intentionally arranges and combines media elements in a particular way, and this carries their vision. In open work, the audience then subjectively discovers the multiple layers of meaning (significant form) inherent in the artist's vision.

Open work, in this sense, relates more to the process of making art rather than to a finished work of art. It is dependent on an artist's intention to have an open-ended work, a work in motion with multiple layers of meaning. This motive determines the nature of the artistic choices in the

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process of making art. Even though Eco does not emphasize this in his book, he explicitly requires this artistic motivation of open work, giving various examples, and considers it an essential difference between modern and traditional art. [1] In this thesis I will expand on this idea and apply it to the field of Interactive Art.

Eco states two main criteria of open work: multiplicity of meaning and involvement of the audience in the production of art. These two notions are mutually dependent. Audiences participate in the production of art by producing their own interpretations of meaning in artworks, and audiences' various interpretations constitute a field of multiple meanings. An artist shifts her artistic interest from a particular message to an audience's interpretation of meanings in artworks: the authorship of meaning is thus moved from the artist to her audience. This shift requires a different way of making art - different from the traditional art practice that intends to generate a single meaning. By anticipating possible meanings by audiences, an artist fabricates her artwork in a way that audiences can interpret in a variety of ways.

Although open work can be aesthetically powerful, the value of the method should not be confused with an aesthetic value. Aesthetic value is defined from a receiver's experience, and the primary value of open work is defined from the artist's experience. Open work is a systematic method of making art, and does not necessarily determine an aesthetic value. A painting can be painted with brushes on a canvas within a set of rules and techniques. What defines it as good artwork is not the brush strokes, palette, rules, or techniques. Its artistic value is determined by how those techniques are applied.

One measurable quality of open work is its degree of openness and how well this corresponds to the optimum. In this paper, I use the word "optimum" intentionally. The number of meanings is not an absolute. An artist has to decide the precise degree of openness for the given circumstances, and in the context of the artwork. The optimum degree of openness is discussed by Italo Calvino in his book, Six Memos for the Next Millennium. While Eco provides a fundamental understanding concerning the openness of artwork, Calvino elaborates this idea with five methodological characteristics of openness: Lightness, Quickness, Exactitude, Visibility and Multiplicity. He explains how open work is applied to the process of making various literary works, using those five values.

B. Multiplicity of Meaning

Let us distinguish two different kinds of "openness": contemplative openness and structural openness. Contemplative openness focuses mainly on mental interaction between the audience

and artwork without much emphasis on structural changes. In terms of the audience participation, the former leaves audience's physical involvement in production of artwork as optional. However, the latter involves an audience's physical actions; and the structural alteration of artwork, driven by audience decisions or responses, is essential.

Eco cites James Joyce's Finnegans Wake and Mallarmé's Livre as examples of open work. Finnegans Wake works on the level of contemplative openness; but Livre works on the level of structural openness, because the audience must physically construct a sequence for the loose pages Mallarmé supplies. In the introduction of The Open Work, David Robey shows a similar understanding of these two notions.

"This is where the analogy works like Mallarmé's Livre obtains; just as Mallarmé's reader would have arranged the pages of the book in a number of different sequences, so the reader of the Wake perceives a number of patterns of meaning in Joyce's language. In the Livre it is the material form that is open, whereas in the Wake it is the semantic content; but each case, according to Eco, the reader is in substantially the same position, because in each case he or she moves freely amid a multiplicity of different interpretations" (x).

Eco does not differentiate these two kinds of openness, semantic and material. Unlike Eco, I suspect these two kinds of openness affect an audience's experience of artwork in distinguishable ways. From the artist's point of view, "the reader is in substantially the same position," dealing with multiple meanings of the artwork, but the reader herself experiences clear differences in the semantically open form and the materially open form. We should understand this situation from the reader's point of view. The material artifact of art is the interface that connects the reader to the meanings of the work and the artist's intention. The details of the interface work in forming the meanings of the artwork. An artist should investigate the materially open form in its relation to her intended meanings.

Being forced to arrange the pages of a book constitutes a significant dissimilarity from the traditional way of reading a book in a pre-arranged sequence. It is an uncomfortable assumption that "the reader is in substantially the same position." Because Eco treats semantic openness and material openness in the same manner, he does not speculate on how an audience's experience of physical involvement in making art would affect their interpretation of meanings in an artwork.

Interactive Art takes material openness as an essential part of the artwork, and the changes of form in artwork by means of the audience's physical participation should be considered in relation to their reception of meaning. Audiences' physical involvement in the process may well affect how they interpret the meanings of artwork. This will be further discussed in chapter four, "Rethinking Open Work in Interactive Art."

Contemplative open work can be difficult to distinguish from traditional closed work, from the audience's point of view. Neither of them creates physical changes in the artwork. Audiences may not see a difference between traditional artwork and open work when they receive a piece of art. However, it requires a great change for the artist. Depending on whether it is open work or not, an artist would design her artwork so that it would deliberately have one layer of meaning or have multiple layers of meaning.

Multiple meanings require deliberate ambiguity. When an audience encounters open art, ambiguity occurs with "the contravention of conventions of expression" in the artwork (Eco xxiv). Communication requires a set of symbols in order to express ideas to others and understand others' ideas. The set of symbols is shared and understood by members of that particular group. A member of the group codes her meanings within the system of symbols, and gives it to another member who decodes and then understands it. By breaking the standard usage of codes, artists can give an audience wonderment and surprise. This reaction draws the audience into an investigation of unknown meanings, and it leads them to a mental engagement with the work.

Eco mentions two kinds of messages in open work: "a univocal message" and "a plurivocal message." These forms of messages are understood with their associated aesthetic values. "From an aesthetic standpoint, both forms are 'open' in that they provoke an ever newer, ever richer enjoyment" (Eco 42). When an artist decides to have one meaning in her artwork, she will concentrate on a singular meaning of communication, but the way it is delivered can be through various channels.

Take Aesop's fables as an example. The stories are simply described and can be easily read by a child. However, the child would only understand the simple acts of animals and humans. When an adult reads the fables, she can understand allegorical meanings portrayed through those simple stories, and expand the ideas of the stories further into the lessons of real life. Each story of Aesop's fables has "a univocal message" of those real life lessons, and the message is charged with complex and condensed lessons of life. It is not revealed at first glance. The more one reads the stories, the newer and richer meanings one discovers. She peels away layers of meaning one by one, and eventually reaches the single meaning. However, in the process there is no ambiguity to wonder about. The reader gets aesthetic pleasure from gaining something deeper.

Aesop's stories still hold ambiguity. Since the meanings can change as one reads, it can be interpreted as a simple kind of open work. Only, the writer hides the ambiguity in the simplistic form of the stories. And one can only realize that the ambiguity was hidden after understanding it.

A writer can do this by hiding ambiguity within familiar usage of symbols. Some readers might find wonderment and surprise, but the visibility of ambiguity is too minimal to stop the reader from continuing the reading of symbols. At every layer, a meaning is clear, but one can under-

stand a progressively deeper meaning each time.

By contrast, open work using "a plurivocal message" openly reveals its ambiguities. The artist of this kind of work concentrates on directing those symbols to something other than their original meanings in order to divorce them from conventional usage. The audience of "a plurivocal message" is expected to explore various meanings through wonder and surprise.

Consider a modern work which exemplifies open work with "a plurivocal message." Abbas Kiarostami created a one-minute long piece as his contribution to the film, Lumière and Company, a collective work of forty-one film directors, commemorating the birth of the first film by the Lumiere brothers.

Kiarostami's piece is a montage of B&W images of eggs frying in a pan on a stove and uses a simple composition with minimal sound and movement. It shows only a frying pan, two eggs, and two male hands, one holding the pan and the other managing the spatula, without showing the man's face. The sound is a mixture of a female voice on an answering machine, speaking in French, and the shrieking sound of oil in the frying pan.

Figure 1: Abbas Kiarostami' 1 minute film
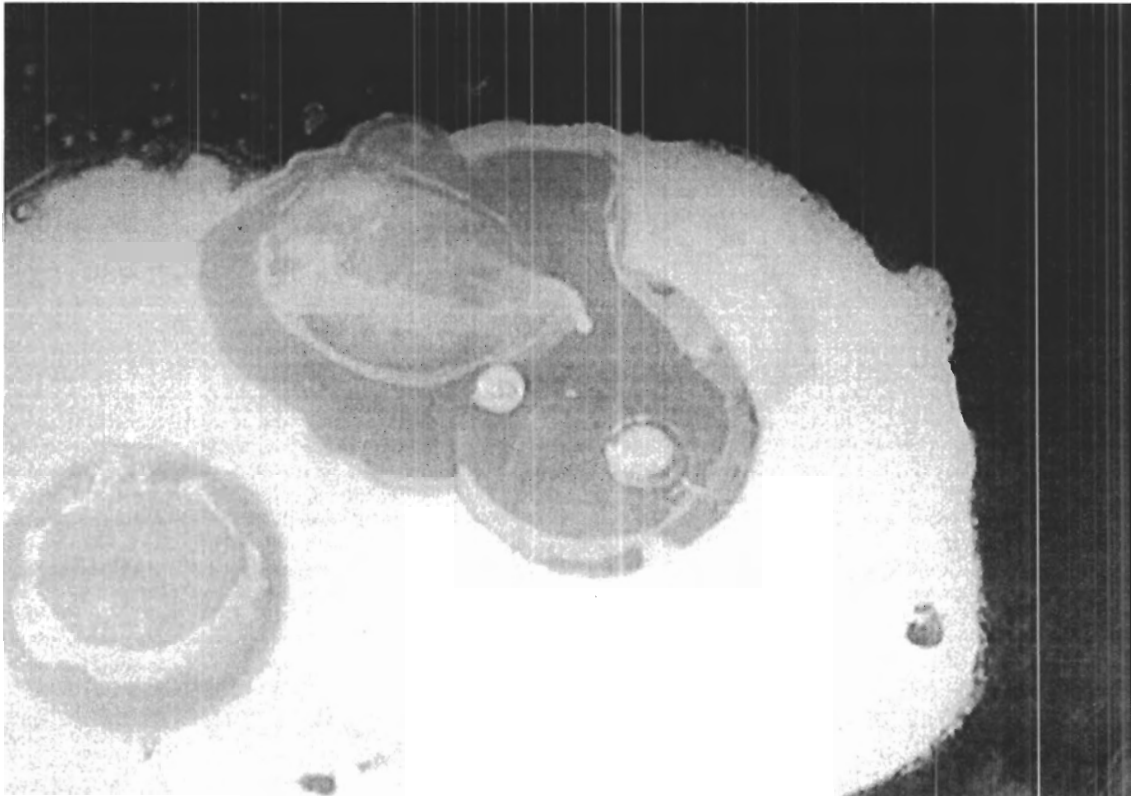
Source: Lumière and Company, 1995, published by permission

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The most distinctive impression of the film is the ambiguous relationship between the images and the sound. Unlike a conventional method of matching sound and image, the image and sound in this film are, at first glance, irrelevant to each other. This unexpected irrelevancy makes audience forces them to search for possible connections and then to wonder about the intention of the film. Eco would regard this unexpected irrelevancy as ambiguity: "the product of the contravention of established conventions of expression" (Eco xi). Since there is no clear connection between the presentation of artwork and its meaning, the scope of interpretation becomes bigger than that of traditional artwork.

However, artists of open work should be cautious when using ambiguity as a method. Even though ambiguity creates wonderment in an audience's mind and multiple possibilities of different interpretations, it could become mere "white noise" if carried to extremes (Eco 96). [2] Eco acknowledges this limit of openness. The optimum point of openness, in Calvino's terms, will be introduced in the next section of this chapter.

Ambiguity in Kiarostami's work is planned deliberately and systematically. The method is to balance the familiarity of an old usage and the alienation of a new usage. The balance should be a precisely tuned mixture of familiarity and alienation. Wonderment lies in the middle ground of this mixture. Then the alienation leads to curiosity - a desire to know and understand the unknown meaning. That desire is the ground of connection between artwork and audience.

In Kiarostami's film, there is an awkward discord between the images of frying eggs and the answering machine voice. However, we can understand this as an extremely economic way of telling a story. Instead of showing images of an answering machine to synchronize the image and the sound, it jumps to the images of frying eggs in the kitchen, forcing us to make the connections.
There are different possible interpretations:

1. The answering machine is on, while he is frying eggs.

2. The answering machine voice could be his memory of the voice message.

The content of the message hints at the situation: Their relationship is not going well; the female character is waiting for the male character to call her back, and he does not respond. There is a bleak indifference in the scene. The following elements hint at various interpretations:

1. The male character's monotonous hand movements imply that he doesn't hear the message.

2. The absence of the male character's face conveys impersonality.

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3. Using an answering machine voice as the female character suggests an obstacle between the two people and a mechanical interpretation of her message. If it were a letter, the scene would be less dehumanized.

These are subliminal hints and create wonderment. The hints drive the possibilities of interpretation. The interpretation is not about the story, but more about the director's intention. The story itself is quite simple. Their relationship has problems. She wants to talk, but he doesn't respond. Either he is mad at her or does not care about her. What is ambiguous is the director's intention.

Whether a piece of artwork has "a univocal message" or "a plurivocal message," what makes it open work is that it has multiple layers of meaning for an audience to discover. It relies on contingent chance and the audience's capabilities. Whether she chooses a "univocal message" or a "plurivocal message," successful open work depends on how the artist controls the symbols and artistic artifacts in relation to her decisions. She can re-arrange them within the boundaries of conventional usage, and enable the audience to reach a single message (univocal), or she can break the conventions, and give the audience more freedom to interpret. The process of making open work oscillates between these two modes to find an optimum degree of openness for the work. This subject is further elaborated in "Italo Calvino's degree of openness."

C. Multiplicity Meanings and Information [3]

Eco borrows from Norbert Weiner's theories of information to clarify the relation between "ambiguity" and "information." However, Eco uses Weiner's ideas in a dialectic way. He uses a converse argument from Weiner's, and creates new definitions of "meaning" and "information" from the tension between the arguments.

Weiner explains order as an essential element in the formation of information: "[T]he informative content of a message is given by the degree of its organization. Since information is a measure of order, the measure of disorder, that is to say, entropy, must be its opposite" (Eco 50). Organization allows a message to be clear with a certain amount of prediction. To reduce noise, which threatens the proper delivery of information, and to keep the informative content organized, one has to repeat the information (what information theorists call "redundancy").

By contrast, in Eco's argument, the degree of ambiguity is associated with information in artwork: "The more one respects the laws of probability (the pre-established principles that guide the organization of a message and are reiterated via the repetition of foreseeable elements), the clearer and less ambiguous its meaning will be. Conversely, the more improbable, ambiguous,

unpredictable, and disordered the structure, the greater the information – here understood as potential, as the inception of possible order" (Eco 93).

While this is consistent with Weiner's theories, the stress is different. In Eco's model, the quantity of information is in an inverse proportion to its predictability. But in Eco's interpretation, information becomes proportional to its ambiguity because ambiguity prevents the prediction of meaning. Eco uses the idea of "redundancy" to support his argument.

While Weiner understands "redundancy" as a way to increase the reliability of information, Eco sees prediction, which is consolidated by redundancy, as a way to reduce perception of information. He uses an example of banal words on a Christmas card. They are so redundant, familiar and predictable, they don't catch our attention. Eco understands meaning as something that is added to what we already know. When information is dismissed, it does not carry a meaning. At this point, we can see Weiner and Eco have different understandings of "information." While Weiner's model constructs meaning independently from the external relation to the receiver, Eco ties the existence of meaning to the receiver's perception. Prediction and attention are dependent on the receiver's perception. As with the case of the Christmas card, if information is redundant, a receiver would have a prediction of the message and would not pay attention to it.

As Eco warns, "redundancy" decreases information. However, depending on how it is used, I suggest "redundancy" can be a useful tool to control the degree of openness in artwork. Avoiding the negative connotation of the word "redundancy," I would use "repetition" instead. The maximum state of entropy, in total disorder, is the informational equivalent of "white noise": audiences cannot sense any meaning in a completely random piece. It can be hard to differentiate this from its opposite: a completely non-redundant piece, fully saturated with information. However, repeated themes can suggests significance, and the audience can be persuaded to look for meaning this way. Repetition can become a guide to lead the audience away from the sense of chaos and toward an interpretation (or multiplicity of interpretations). Of course, too much repetition will limit the scope of information, and the artwork can lose its poetic qualities.

Continuing his departures from Weiner's statistical study of information theory, Eco defines information differently: "... [I]nformation has a far wider meaning in statistics than in communication. Statistically speaking, I have information when I am made to confront all the possibilities at once, before the establishment of any order. From the point of view of communication, I have information when (1) I have been able to establish an order (that is, a code) as a system of probability within an original disorder; and when (2) within this new system, I introduce - through the elaboration of a message that violates the rules of the code-elements of disorder in dialectical tension with the order that supports them (the message challenge the code)" (Eco 58).

While Weiner doesn't make distinction between information and meaning, and uses the two

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concepts synonymously, Eco differentiates meaning from information. For Eco, information is perceived by a reader first through "a system of probability." An "original disorder" prevents information from being dismissed by "redundancy." Once the information is noticed by the reader, meaning is formed by the organization of the information. If the organization of information makes decoding ambiguous, it will yield diverse interpretations and therefore create a vast field of multiple meanings. In the opposite case, if the organization of information is narrow, the audience will draw fewer meanings from the information.

In order for an audience to reach a field of meanings, the information of a new system should be readable first within an established code. Without readable information, the audience would not have any access to the meaning. Then, later, the audience can become aware of new and strange departures from the conventional use of the code. The ambiguity evoked by the new system will lead the audience to multiple layers of meaning in the artwork. Open work is created from this dialectical tension between the order and the ambiguity. The artist should control this tension in a form of "organized disorder in a system to increase its capacity to convey information" (Eco 60).

D. Audience Participation in the Production of Making Art

In the introduction of The Open work, David Robey provides a condensed clarification of the relationship between multiplicity of meaning and audience participation in the production of making art. "What such works [of "open" artwork] have in common is the artist's decision to leave the arrangement of some of their constituents either to the public or to chance, thus giving them not a single definitive order but a multiplicity of possible orders;"

We can have a closer look at the definition of "meaning." Who is the author of meaning? Is it artist or audience? Meanings are initiated by an artist, and she designs the artwork to convey the meanings. However, the meanings ultimately reside in the audience's interpretation rather than the artist's initial intention. It cannot be regarded as open work, in a true sense, if the artist doesn't invite audience to the production of making art: it is collaboration of both parties - the artist and the audience. Since the artist plants multiple layers of meaning in the artwork, there must be multiple layers of meaning from the audience members' individual perspectives.

The fact of the audience's various interpretations of artwork is an underlying condition for multiple possibilities of meaning in open work. An artist can design her artwork to carry multiple meanings, anticipating an audience's various understandings.

Eco implies the interpretation of artwork is the main part of an audience's participation in the production of art. As in Mallarmé's Livre, an audience can participate in the production of artwork in a physical context by choosing and assembling the separated pages of writing. However, Eco is more concerned with the audience's interpretation, not so much with how the work has been physically changed by the audience. Interactive Art, by contrast, considers the process of how an audience influences or changes artwork as an important part of the work. Perhaps the media technology of Eco's time couldn't prepare Eco to anticipate this kind of physical interaction between audience and artwork. I will elaborate on this in chapters four and five.

CHAPTER 2. ITALO CALVINO AND "THE DEGREE OF OPENNESS"

Multiplicity of meaning does not entail an infinite number of meanings. It refers to an indefinite number of meanings. The human mind, according to Calvino, cannot conceive of the concept of "infinite," (Six Memos 63) and referring to an infinite number of meanings makes it impossible to measure the degree of openness. In contrast, an indefinite number of meanings allows one to measure the degree of openness. An open work can have a limited number of possibilities and yet the precise number can remain unknown. It depends on the degree of openness determined by the artist. She has to find the proper degree for each case. The issue is not about whether artwork is open or not, but about how much openness is needed.

I borrow these ideas of Calvino's to explore the implications of varying the degree of openness. In his book, Six Memos for the Next Millennium, Calvino elaborates five values: lightness, quickness, exactitude, visibility and multiplicity. [4] For all five values, Calvino emphasizes, a balance exists between each value and its mate: lightness and heaviness, quickness and lingering, exactitude and vagueness, visibility and verbality, and multiplicity and uniformity. Balancing the degree of openness requires fine-tuning all five of these opposing forces. Also, Calvino's methodology for balancing the five values applies equally to balancing the degree of openness, so it is useful to explore them in greater detail.

A. Five values: Lightness, Quickness, Exactitude, Visibility, and Multiplicity

These paired values work in an inverse relation. Increasing one value means decreasing the other. Lightness is defined in comparison to heaviness, etc. Balancing these forces works to prevent a work from falling into one extreme or the other.

a. Lightness

Calvino implies "a lightness of thoughtfulness" as an example. The phrase shows the juxtaposi-

tion of two opposing values: lightness and heaviness. The lightness has the weight of thoughtful-ness. By contrast, "a lightness of frivolity" has double layers of lightness, lightness and frivolity, without its counterpart (Calvino Six Memos 10). While the latter suggests one direction of light-ness, the former shows a full spectrum. Calvino quotes Guido Cavalcanti for being weightless, and Dante for being weighty and concrete. These two styles refer to two opposite tendencies in literature in the last century: "one tries to make language into a weightless element like a cloud" and "[t]he other tries to give language the weight, density, and concreteness of things, bodies, and sensations" (Calvino Six Memos 15).

"In Cavalcanti everything moves so swiftly that we are unaware of its consistency, only of its effects. In Dante everything acquires consistency and stability: the weight of things is precisely established. Even when he is speaking of light things, Dante seems to want to render the exact weight of this lightness" (Calvino Six Memos 15). Calvino's lightness stays in a balance between these two tendencies. It is accompanied with the heaviness of "precision and determination, not with vagueness and the haphazard" (16).

This logic works in the the same way for the other four values: quickness, exactitude, visibility and multiplicity. Each value cannot be appreciated without its opposing value: lingering, vague-ness, verbality, and uniformity. Those opposing forces contrast and complement each other.

b. Quickness

Calvino appreciates the economy, rhythm, and hard logic in folktales and fairytales. "The tech-nique of oral narration in the popular tradition follows functional criteria. It leaves out unneces-sary details but stresses repetition: for example, when the tale consists of a series of the same obstacles to be overcome by different people" (Calvino Six Memos 35).

Being used to the pattern of folktales, a listener understands the re-occurrence of the same pat-tern without the same amount of explanation as the first time. Repetition speeds up the progress of story and gives a rhythmical pattern in the telling. This can be compared to the repetition of some musical themes in a song, or to rhymed phrases in a poem. While those rhymes and rhythms create temporal sensations to our ears, the repetition in story telling gives rhythms in our imagination. As Calvino puts it, "a child's pleasure in listening to stories lies partly in waiting for things he expects to be repeated: situations, phrases, formulas." This pleasure can be related to Calvino's metaphor of riding a horse: "The novella is a horse, a means of transport with its own pace, a trot or a gallop according to the distance and the ground it has to travel over" (Six Memos 39). The speed is a mental speed, and it characterizes the journey of experiencing a story. The pleasant riding has the familiar rhythm and style of the horse's trotting.

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Calvino's notion of repetition can be compared to Eco's redundancy. Eco gives the example of the words on a Christmas card and vowels in a word (51-52). As in the word "building," what we are concerned with is the consonants of "bldg." The vowels, "uii," are inserted to make pronunciation smooth and comprehension easier. The words on a Christmas card serve to indicate it is a Christmas card. Understanding the information of the words is not essential for the context.

The speed of story telling should be a fine balance of swiftness and pondering. Each value is valuable for its own sake, and both of them are needed to form a story. A good story teller should be able to find a way to control duration - the secret of rhythm that joins one story to another, slow and fast, and breaks off at a right moment.

c. Exactitude

In explaining the value of exactitude, Calvino starts with the beauty of the vague and indefinite (Six Memos 59). The value of exactitude is defined against its opposite value: vagueness. The degree of vagueness is attained by "a highly exact and meticulous attention to the composition of each image, to the minute definition of details, to the choice of objects, to the lighting and the atmosphere" (59-60).

Calvino discusses two types of knowledge: one in "the mental space of bodiless rationality" and the other in the space of described objects. The latter refers to the sensible space of bodily rationality. For this, Calvino finds an interesting relationship between exactitude and vagueness: "what is sayable and not sayable" (Six Memos 74). This is where an artist should be concerned with the degree of exactitude and that of vagueness at the same time. She has to be aware that less exactitude means more vagueness.

Calvino states that the "natural" language of bodily rationality says more than the formalized language of bodiless rationality. It always involves "a certain amount of noise that impinges upon the essentiality of the information": vagueness (Calvino Six Memos 75). The vagueness brings up possibilities of what can be experienced. However, the vagueness has to be exact.

d. Visibility

The above relationship is further developed with the values of visibility and verbality. Calvino distinguishes imaginative processes into two types: "the one that starts with the word and arrives at the visual image, and the one that starts with the visual image and arrives at its verbal expression" (Six Memos 83). He takes an example of a writing for cinema. A director starts with imag-

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ining what is seen on the screen. Then, she writes those images in her mind in order to physical-
ly reconstruct them on the set. [5]

These two types of imaginative process compliment each other in literature as well. A writer
starts with her visual imagination which carries meaning to be further developed. The artist might
not understand what the meaning is in discursive or conceptual terms, but she knows it is impor-
tant. The visual imagination, then, initiates the verbal process. The writing becomes conceptual
as well as visual from this stage on (Calvino Six Memos 89). The artist has to balance the con-
ceptual process and the visual process.

e. Multiplicity

Calvino next turns to the encyclopedic quality of the contemporary novel: "a network of connec-
tions between the events, the people, and the things of the world" (Six Memos 105). This net-
work is composed of fragments. This type of work doesn't have an ultimate end, since the num-
ber of networked fragments can be unlimited; however, it should have a temporary end, as a
complete work. Its multiplicity comes, in part, from its potential continuation.

Calvino then introduces the idea of "active skepticism" as a way to understand the manifold
nature of knowledge in our modern time, and to produce encyclopedic multiplicity in artwork.
This active skepticism should be combined with exactitude. The task is not to find an end point,
but to find where to stop weaving the network of multiplicity.

Calvino mentions systems and rules, using James Joyce as an example. According to Calvino,
Joyce was equipped with a profound knowledge of theology and constructed "a systematic and
encyclopedic work that can be interpreted on various levels according to medieval exegetics,
such as *Ulysses* and *Finnegan's Wake*" (Six Memos 117).

Artists should systematically fabricate the work to fine-tune the extent of the multiplicity. This is a
warning against an easy misunderstanding of openness: vagueness. In order to stop openness
from collapsing, one must construct multiple possibilities in systematic precision.

B. The Degree of Openness

Calvino finds a common theme in these five values; each value should be calculated and meas-
ured precisely in comparison to its counterpart. Let's say I have 75% lightness. That means I
decided to abandon 75% of the heaviness. Conversely, I would expect 25% heaviness and
abandon 25% of the lightness. This measurement should be obtained patiently and adjusted
meticulously. Calvino explains this with simple words. "It acquires the finality of something that
could never have been otherwise" (Six Memos 54).

The degree of openness is determined in the balance between what is shown and what is hid-
den. The beauty in what is hidden is greater than in what is shown. What is shown is only a key
and a hint to open up the hidden world in the audience's mind. The audiences have to discover
the hidden part. The artist's job is to mold a key to the invisible world at its most precise point.
The point is in "the relationship between a given meaning of artwork and all its possible variants
and alternatives, everything that can happen in time and space" (Calvino Six Memos 68). An
artist should fabricate the visible in relation to the invisible and use just enough of the visible to
determine the desired variants and alternatives of the invisible.

This is the engine that operates the opening up of artwork, and also a potentially devouring
obsession, as Calvino puts it (Six Memos 68). An artist can get lost in contemplating the endless
possibilities of variants and alternatives. She should find where to stop and draw a line between
what is possible and what is not possible.

These decisions save open work from falling apart, but they require rules and systems. The rules
and systems rely on what audiences already know. In communicating with audiences through a
new system, an artist has to rely on the old conventional systems and rules first, since audiences
are not equipped with her new system. The conventional system is a tool explaining the new sys-
tem and provides a transition to it. If an artist tries to speak about her new artistic discoveries,
without conveying the context, in her foreign language, there will be no proper communication.
Calvino warns of this:

"The classical author who wrote his tragedy observing a certain number of known rules is freer
than the poet who writes down whatever comes into his head and is slave to other rules of
which he knows nothing" (Six Memos 123).

Eco makes a similar observation. He differentiates classical art and contemporary art according
to the preservation of a linguistic system. Classical art tries to create new ideas within the known
linguistic system, which audiences are familiar with; but contemporary art constantly challenges
the known system and imposes "a new linguistic system with its own inner laws" (Eco 60).

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However, Eco admits that the practice of contemporary art oscillates between "the rejection of the traditional linguistic system and its preservation" (60). "[A] new linguistic system with its own inner laws" is not immediately accessible to audiences, at least not until the audiences have learned the new rules. I suggest it might be fruitful to find a point of balance between the old and the new, instead of continually oscillating between the two. Oscillation can be a way to find this point, which is part of the logic of any artwork, but once this point is clear, it may no longer be necessary to go back and forth.

In fact, a completely new linguistic system might not be possible, which might mean that there can be no completely open work. Our perception is restricted, consciously or unconsciously, by learned ways of seeing. This is true of natural phenomena and even more true with human artifacts. We learn about human artifacts through education, and education is delivered through conventional linguistic systems. One can invent an original idea, but cannot create a completely new linguistic system for expressing it without using the old linguistic system as a bridge. The first generation of photographers worked within the system of painting, since it was the only one available, and developed their new system from it. And the new system always preserved the roots of the old one.

An artist cannot generate new ideas, even for herself, without the understanding of what has been done before. We understand the new only by comparison with the old. A new idea starts from old ideas, either in opposition to them or by modifying them.

For example, consider the use of metaphor and allegory in open work. The allegories of Aesop's fables are contained in animal stories. Those are stories we can easily understand. However, the real message is the wisdom of human life carried by and within the animal stories. This is only possible because we make the metaphorical connection between the animals and humans. For this, we must accept a "suspension of disbelief." [6] We don't question that a fox can talk, stand, or climb up a tree. In achieving this suspension, the audience collaborates with the artist in order to form a sensible narrative. With metaphor and allegory, the artist uses what audiences already know from their experiences and imagination in order to introduce new ways of seeing.

Samuel Taylor Coleridge, in his Biographia Literaria, coined the phrase, "willing suspension of disbelief," to describe an audience's poetic faith: "... it was agreed, that my endeavours should be directed to persons and characters supernatural, or at least romantic, yet so as to transfer from our inward nature a human interest and a semblance of truth sufficient to procure for these shadows of imagination that willing suspension of disbelief for the moment, which constitutes poetic faith" (Chapter XIV).

In open work, this faith includes the audience's willingness to complete the artwork. In a successful work, the audience is induced to accept the artistic validity of the imaginary world that

the artist has constructed, but they do not necessarily believe this imaginary world is real or even realistic. The artist's imaginary world only has to be consistent within its own logical universe. Aesop's fables are situated in the world of anthropomorphism. Audiences understand that the stories depict human activities and their motivations. As long as the artist is responsible for the promised logic she has set, the audience is willing to put aside their disbelief and immerse themselves in the artist's imaginary world.

The degree of openness stands at the balance between the audience's world and the artist's world. Each world has a social sector, which corresponds to the real world of daily life, and a personal sector, which relies on one's imagination. The world of the audience and artist cannot see each other if they meet in their personal sectors. The two worlds overlap in the social sector. The audience suspends their disbelief and explores the artist's imaginary world. Along the way, they try to find clues to understand the world of the artwork. The artist should provide them with these clues.

"Suspension of disbelief," as an artistic device, is intended to take the audience into the artist's imaginary world in a "trance." Bertholt Brecht rebelled against this kind of "trance." He used the method of alienation to prevent audiences from becoming too seduced in a story and identifying with the characters (Peters). He rejects the "trance" that comes with "suspension of disbelief." This kind of "trance" causes the audience to forget about the structural artifacts of the artwork and the artist's intention, and focus on the content or story in the artwork.

Most experimental or new artwork challenges previous conventions. Alienation and strangeness push an audience to wonder about the intention of the artwork and the artist's purpose. Deprived of the trance of an imaginary world, the audience stays in their realistic world. They wonder about the purposes of the artist and try to trace the threads of meaning within the work. Brecht's alienation constitutes a perfect environment for open work. Audiences are forced to think rather than be taken over by the plot. In this environment they are not simply spectators, but instead become mentally involved in the issues presented. [7] This generates multiple layers of meaning. An artist of open work should decide how to use these different modes: alienation and trance.

Art is a game between artist and audience - a game in which an artist reminds an audience of what they already know but have forgotten, and lets them find themselves in remembering. The audience will make new discoveries with the help of the artist. The new discoveries lie within the multiple layers of meaning.

CHAPTER 3. OPEN WORK IN RECENT ART HISTORY

The notion of "interactivity" in Interactive Art can be traced back to the idea of open work, which was prevalent in art movements in the 1950s and 60s: the Situationist International, Happenings, Fluxus, the Living theatre, Chance Operation and others. [8] The main drive of these art forms was the rejection of the creation of an art object as a fixed precious object, instead focusing on the audience's active participation in making art. Open work systematized certain methods of these avant-garde movements in which artists defied fixed forms of art and constructed open-ended processes as a form of art production. A work of art, then, opens up a field of possible meanings, rather than having one direct meaning communicated from an artist to an audience. This changed the relationship between artist and audience from a hierarchical structure of author-receiver to a more democratic one of artist-participant.

The historical background of open work corresponds with avant-gardist ideas: departing from the traditional way of making art, merging art and reality, and diminishing the presence of the artist in artwork. However, open work does not belong exclusively to any of these movements, but echoes through the various "isms" of art. It is a theoretical framework for making art, and the value of open work is its communicative function. It studies artistic communication in recent art practices, and helps contemporary artists understand how they can reach their audiences more effectively. Open work is essential knowledge for artistic practice across many different fields.

This chapter will explain the lineage of open work as a systematic method during the Modernist period and connect it with the notion of interactivity.

A. Art historical Backgrounds of Open Work and Interactive Art

Eco's The Open Work is from his observation of the new social and cultural phenomena over the late 19th century and the first half of the 20th century. Eco posits open work as a systematic idea that distinguishes modern art from traditional art. The notion of modern art is strongly associated

with the avant-garde movements of the time, and the cultural and social context of open work is largely identified with the avant-gardist ideas: interaction, participation and communication. [9] These ideas involve "a movement from the closed to the 'open' work of art, from the static object to the dynamic process, from contemplative reception to active participation." (Arns 1) There is a degree of difference, but most avant-gardist artists share two attributes: political and experimental. Those rise of these two attributes are often attributed to Dada and Surrealism in the early 20th century; though the experimental tendency arguably started with Baudelaire and Mallarmé. Their attitudes resonated through the art movements of the later part of the century.

Dada was an anti-art movement. The Dadaists fundamental attitude was to reject standards in art, and oppressive intellectual rigidity in society, promoted by the bourgeois interests. They turned away from the elite world of traditional art practices and tried to find alternative ways of making art: a way to destroy the established arts, in other words.

The Idea of the Fabrication

horizontal

-- If a thread   one meter long   falls

straight

from a height of one meter on to a horizontal plane

twisting as it pleases and creates

a new image of the unit of

length --

-- 3 examples obtained more or less

similar conditions

: considered in their relation to one another

they are an approximate reconstitution of

the unit of length

The 3 standard stoppages are

the meter diminished

Figure 2: Note for 3 Standard Stoppages

Source: Tout-Fait: The Marcel Duchamp Studies Online Journal, by permission [10]

In this revolutionary attempt, artists adapted "chance operation" as a way to depart from convention. Marcel Duchamp practiced highly unusual ways of making art. One of his methods, under the theme of open work, is 3 Standard Stoppages. [11] This is based on "chance operation," which was developed further by John Cage and other artists. The use of chance processes let an artist access alternative solutions outside of the sphere of her intellect, personality, experience and culture. However, it is different from a purely random process. Most chance operation in artistic creation follows basic rules or guidelines. This tempers and skews the process of chance, while keeping a certain degree of unpredictability. An artist can use these rules as a way of controlling the degree of openness in her artwork. The relationship between probability and unpredictability is set by the rules, and the degree of openness is defined by this relationship.

Duchamp prepared a protocol to execute the process of 3 Standard Stoppages. It is believed that "he had dropped three pieces of string, each exactly one meter long, each from a height of exactly one meter, and each only once, onto a canvas. He then glued each string to the canvas in the exact position of its chance fall" (Shearer and Gould). Even though Duchamp didn't follow the protocol in a strict way, adding his characteristic irony, the work was initiated by the rules that he set. [12]

John Cage was famous for his meticulous preparation of chance operation. [13] Take, for example, his Imaginary Landscape No. 4 (1951). In the composition, the score was conceived using the Chinese "Book of Changes," the "I Ching." The performance included 12 radios, 24 performers, and a director. Each radio has two players; one controls the frequency the radio is tuned to, and the other controls the volume level. Cage wrote very precise instructions in the score about how the performers should set their radios and change them over time, but he left the actual sound coming out of them to chance; it was dependent on whatever radio shows were playing at that particular place and time of performance. Every performance was unique. As a further development from his previous work, this piece includes indeterminacy at the level of performance as well as composition.

If we compare these two works of Duchamp and Cage, we can find differences in how sense is formed through the process. While Duchamp minimized the importance of rules in order to enhance the ironic sense in his work, Cage's piece has the rule as a main focus.

The article of Shearer and Gould explains that Duchamp meant to poke fun at the conventional idea of "meter," the absolute unit, standardized by the French revolutionary government in 1791. However, Duchamp has hidden a joke in his simple procedure with string. The gentle curves of string were only possible by sewing them through the back of the canvas. He didn't follow his actual protocol literally, but didn't hide his trick either. If one pays careful attention to the back part of the canvases, she can find out how he managed the gently curved lines. The title, the note explaining the protocol, and the plastic artwork form an intellectual connection between an

audience and the artist's joke, after the true meanings of "stoppage" and "one meter" are discovered. In terms of open work, the merit of Duchamp's piece is in its ambiguity and its irony, rather than in the chance operation itself.

Figure 3: Duchamp's 3 Standard Stoppages
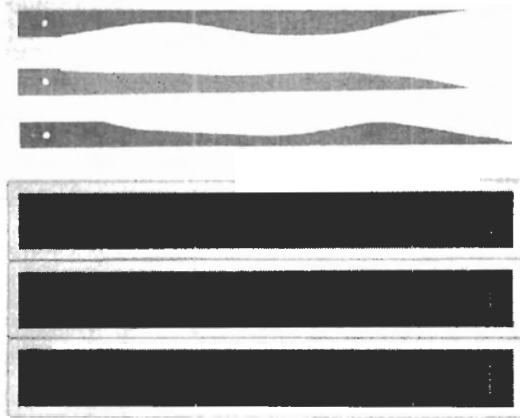
Source: © Tout-Fait: The Marcel Duchamp Studies
Online Journal, 1999, re-published by permission

In comparison to Duchamp, Cage's work strictly follows his rules of chance operation. His deep insights into Zen Buddhism dominate most of his artwork. The artwork becomes more than a means of communication. It becomes a manifestation of his philosophical belief; and the meticulous rules in the preparation of artwork are part of his ritual. One cannot simply understand the meaning of the piece without being on the same level as Cage. Even though one might be able to understand the meaning of the artwork from Cage's monk-like commentary; it requires philosophical growth in order to enjoy and connect oneself to the artwork.

Both Duchamp's and Cage's systems were conditioned by the environments. The artists could not control these environments. For Duchamp's piece, 3 Standard Stoppages, gravity made the strings fall down; and for Cage's Imaginary Landscape No. 4, it was a radio show playing at a particular place and time of performance. Even though they had different artistic purposes for setting these rules, they made careful choices in anticipation of desirable results. Duchamp's "one meter" corresponds to the standard unit of measure, and the title "stoppages" refers to the trick that he used to achieve the curved lines of strings.

In Imaginary Landscape No. 4, Cage gave himself some control over the chance operation by having two separate performers operate the frequency and the volume of the radio. These kinds of rules become a tool to determine the degree of openness. On the surface, Cage's work seems to be "purposeless play." Actually, a deep intention is planted in his chance operation. Marjorie Perloff explains that purposeless play does not mean that any random acts can become art. It

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means that "the ordinary can provide all that the artist needs to make 'something else.' Indeed, the challenge is to take the ordinary - words like 'it' and 'one' and 'function' and 'situation' - and 'miniaturize' it into 'something'" (Perloff "Music"). [14] Ironically, Cage's intention of "something" is "unreadability." It is "a carefully plotted overdetermination designed to overcome our conventional reading habits" (Perloff "Radical").

Chance operation prevents a direct connection between the meaning and the manifestation of artwork. There is always contingency between the two. The rules can be used to control the amount of contingency, and the degree of openness lies in how much contingency is added or taken out.

While Duchamp's and Cage's chance operations concentrate on openness in their own artistic creation rather than the audience's participation, "Happenings" actively invite audiences to participate. The audiences themselves are performers. Usually an audience is given a program of what to do, and they follow the instructions. The program can use the rules of chance. The function of the program is only to initiate the process, but the focus is the audience's spontaneous acts and experiences. Alan Kaprow, the best known figure in the Happenings movement, gave the below instructions to the audience for his 18 Happenings in 6 Parts. [15]

"The performance is divided into six parts...Each part contains three happenings which occur at once. The beginning and end of each will be signaled by a bell. At the end of the performance two strokes of the bell will be heard...There will be no applause after each set, but you may applaud after the sixth set if you wish" (Schimmel 61f).

In Happenings, there is no division between performer and audience, or between art and reality. Audiences perform, and their spontaneous acts are performance. This is an extreme form of open work on a structural level. The audience participation in Interactive Art resembles that of Happenings, in the sense that the audience performs.

Fluxus also had performance components, but its characteristics are fundamentally different from Happenings. Its main purpose was to mock the high culture of serious art. Most of Fluxus artwork is accompanied by shocking effects, and the ideas were highly political. Fluxus was more about ideas than any specific medium. The artists of Fluxus blended different artistic disciplines, and aimed at the universality of art. They directly attacked commercial art and tried to make all artists of their movement equal. Amy Spencer draws attention to this sense of community. "It was envisioned that all artists should sign their artwork simply 'fluxus' without adding their own names" (Spencer 129). This communal sense gave rise to "mail art." [16]

Mail art has become a world-wide movement. Its method is that "[a] small scale artwork 'in progress' is sent out via post to other artists with directions for the next artist to add to the work

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and pass it on. . . Mail artists played with the idea of a mass media culture and developed a new form of cultural exchange, ..." (Spencer 129). It is political and satirical toward main stream art, and is fun at the same time. The idea of détournement, borrowed from the Situationist International (SI), can be seen in the use of the everyday media of postcards. Mail art brings more than openness in artwork. Politically, it departs from the standard ideas of commercial art. It is not confined within the setting of a gallery or museum. Also, it eliminates the traditional boundary between artist and audience. Artists themselves are the audience. In addition, the artists of mail art established an important concept that has become one of the main art practices in Interactive Art; artwork changes and grows constantly among a network of collaborators across physical distance.

Ryosuke Cohen started one of the largest mail art projects in 1985: Brain Cell. Cohen was inspired by Ruggero Maggi's mail art and his conception of "Amazon River." He is currently working on an ongoing work called Brain Cell, an organic system constructed with complex artistic ideas compiled from all over the world (Cohen). This idea of an organic system conceives of the ever-changing form of open work and its network of artists as one whole body.

Figure 4: Brain Cell

Source: Mail Art, © Ryosuke Cohen, re-published by permission

Avant-garde artists consciously chose open work as a way to express their new artistic visions. The "Work in motion" (opere in movimento) of open work is expressed in diverse forms: the chance operation of Duchamp and Cage, the ephemeral improvisations of Fluxus, the audience participation of the Happenings, and the networked collaboration of mail art.

All these methods are relevant to Interactive Art. However, the artistic practices in Interactive Art diverge from the original idea of open work, and unfortunately the result is less effective. Many theorists are worried about the situation. Inke Arns explains how ideas of open work in earlier avant-garde movements" were replaced by a more technological and media-based definition of interactivity (human machine interaction)" from the 1980s to the 1990s (2). This created conflict between the traditional sense of open work and its application in Interactive Art in ways that might succeed in involving the audience in the production of art, but fail in the production of meaning or the communication of vision.

Since the early days of Modernism, the art world has been affected by media technology. The avant-garde artists believed they could reconcile art and the people by using media as a artistic tool. These hopes were expressed through film, radio and television. We can count examples of "Dziga Vertov's and Walter Ruttmann's designs for a new film art, Bertolt Brecht's radio theory, or the Futurists' Manifesto for television" (Daniel "Forerunners" 2). So the heavy use of media cannot alone be blamed for the current problems in Interactive Art.

I suspect that the idea of open work is not properly understood in Interactive Art. The motives for using technology in open work have not been fully thought out, and the importance of artistic motivation in open work is minimized in relation to technology. I propose a new understanding of open work in Interactive Art in chapter five.

B. The Shift of Relationship Between Artist and Audience

One of the interesting features of open work is that artists try to open up more and better possibilities for approaching audiences. They try to understand what the audience receives from artwork, and they put the focus of the artwork on audience reception. This is a considerable shift in the political and social aspect of art. The relationship of author and audience changed from a vertical, one-way channel to a horizontal two-way channel, in a seemingly new social structure. The artist breaks the role of sole creator and invites the audience to participate in the process of making art. This envisions a quasi-democratic relationship between artist and audience. The authentic presence of the artist is lessened, and the audience can face the artwork on its own, without the aura. According to Walter Benjamin, the decay of aura in artwork was caused by its mechanical reproduction. The reproduced copy of artwork is independent from the original work (Benjamin Work of Art). It does not have the unique history of the original. The mystique of the author is part of the aura of artwork, and the importance of the author was weakened with the decay of aura. [17] Aura and authenticity are cultural concepts and are sensitive to social changes. Benjamin's reproduced artwork and Eco's open work were influenced by the rising cultural

importance of common (working class) people and by the efforts of Modernists to oppose the class system.

According to Roland Barthes, in <u>The Death of the Author</u>, the author is a modern concept. Barthes differentiates "the author" from the performer of "narrative code" in ethnographic society. The narrator was a "mediator, shaman or relator whose 'performance' - the mastery of the narrative code - may possibly be admired but never his 'genius.'" (Barthes 142). He was, according to Barthes, a deliverer of narrative, but her existence as a person is disconnected from the narrative. "The author is a modern figure, a product of our society ... [I]t discovered the prestige of the individual, ... , the 'human person'" (142-143). The author, in the opaque manifestation of a "human person," explains the work through the devices of fiction. The work cannot stand on its own, apart from its owner.

Regarding the author as the owner of the text, Barthes states, "the writer can only imitate a gesture that is always anterior, never original. His power is to mix writings, to counter the ones with the others, ..." (Barthes 146). Writing is a collection of marks drawn from the innumerable centers of culture. "The book itself is only a tissue of signs, an imitation that is lost, infinitely deferred" (147). There is no true owner of the book.

Barthes uses Mallarmé as an example of a writer attempting to cut the tie between the work and the author. Impersonality is a prerequisite of this task; the language acts and performs, but not the author. Marcel Duchamp goes further by stating "a work is made entirely by those who look at it or read it and who make it survive by their accolades or even their condemnation" (Arns 3). It is understandable for the avant-garde artist to make such an extreme statement. Barthes's idea of "the death of the author" implies the previous existence of the author. The author or artist has to free her artwork from her "human person." But when we think of artwork as a process, the process still starts from the artist.

I do not favour the notion of everyone being an artist. Artist and audience have different roles in forming art. Being an artist requires skilled craftsmanship as well as philosophical insight. This includes her decisions on how to interact with her audience. She needs to understand ideas involved in making the decisions. She has to open up the possibilities, and the audience then can actualize the possibilities. "The Author, when believed in, is always conceived of as part of his own book; book and author stand automatically on a single line divided into a *before* and an *after*" (Barthes 145). The artist gives birth to and nourishes the artwork. Then, she has to let it go. The artwork is complete when the audience receives it. The voice of the text is the reader's, not the author's. The reader hears her voice cite the text in the place of the author.

Eco wrote <u>Opera aperta</u> (Open Work) in 1962, and Calvino wrote <u>Six Memos for the Next Millennium</u> in 1985. [18] As Eco took in his consideration a new mode of social and cultural

changes in the late 19th century and the early 20th century, Calvino observed the changes of his time and anticipated the status of writing in the near future. While Eco explains the audience's role in open work, Calvino exercises the idea through his writing. His If On a Winter's Night a Traveler is a fine example of his interest in the relationship between author and reader.

Calvino puts the audience in charge of completing a book. In the modern sense, artwork is never finished on its own. It continues beyond the artist. It grows and develops through an audience's reading. "Reading is going towards something that is about to be, and no one yet knows what it will be...." (Winter's Night 72).

The story of If On a Winter's Night a Traveler is about reading books inside of books, and stories inside of stories. It contains a frame story about a reader's quest for a book and for another reader. The reader searches for the true author and story of the unfinished book he reads. The rest of the book consists of fragments of books that they read along the way. In the book, Calvino inserts his curiosity over how a reader receives stories.

"In any case, the person who finds this diary will have one certain advantage over me: with a written language it is always possible to reconstruct a dictionary and a grammar, isolate sentences, transcribe them or paraphrase them in another language, whereas I am trying to read in the succession of things presented to me every day the world's intentions toward me, and I grope my way, knowing that there can exist no dictionary that will translate into words the burden of obscure allusions that lurks in these things. I would like this hovering of presentiments and suspicions to reach the person who reads me not as an accidental obstacle to understanding what I write, but as its very substance; and if the process of my thoughts seems elusive to him who, setting out from radically changed mental habits, will seek to follow it, the important thing is that I convey to him the effort I am making to read between the lines of things the evasive meaning of what is in store for me." (Winter's Night 61-62)

This shows that it is impossible for a reader to receive the story intact, as the author meant it. There will always be distortions of interpretation. The authentic voice of the author is an imagined voice that a reader creates through her reading. Calvino uses this strategically. He lets his readers free from the author's intention, to find all the possible ways of reconstructing the story. According to Calvino, there is no pre-existent final answer. [19] This is only the reader's illusion. However, this is an important illusion for her to carry in order to fulfill her role as audience. The role of audience is separate from that of artist.

"There's a boundary line: on one side are those who make books, on the other those who read them. I want to remain one of those who read them, so I take care always to remain on my side of the line. Otherwise, the unsullied pleasure of reading ends, or at least is transformed into something else, which is not what I want" (Calvino Winter's Night 93).

In the sense of open work, an artist does not necessarily create multiple meanings for herself. She already knows the intention of her artwork and may have her own personal reading. Multiple layers of meaning arise through the separation of roles: artist and audience. The audience will always try to look for the author's and artist's presence through the artwork: the ghost of the artist whom they will never catch, except in their imagination. In this sense, artwork is the collaboration of artist and audience. Once one crosses the border, and breaks the relationship, the artwork cannot be completed.

C. New Functions of Art: Converging Art and Reality

The avant-garde artists of open work rose during the historical period of Modernism. [20] The ideas of open work developed concomitantly with ideas of social and political class struggle between the bourgeois and working classes. In this context, avant-garde artists questioned the status and functions of art in.

After art lost the patronage of the nobility and the church, artists had to find a way to survive in the free market system, where it was dependent on museums, galleries, bourgeois clients, and academia. Art became a more autonomous institution. During this process, art became somewhat detached from reality. Herbert Marcuse traces this to the "affirmative character" of bourgeois culture ("Affirmative Character").

In a free market system, according to Marcuse, individuals are placed "in the relation of buyers and sellers of labor power," and "the reproduction of material life takes place under the rule of the commodity form and continually renews the poverty of class society." Then, there is no room for the good, the beautiful, and the true (Marcuse "Affirmative Character" 90-93).

In this system, most people spend their lives providing for necessities, and only a small number of chosen ones have access to beauty. This is the same classical model which, in other guises, existed before bourgeois society. However, bourgeois society does not have the same "good conscience" that the classical model had (Marcuse "Affirmative Character" 93).

The concept of "culture," while lifting "the spiritual world" out of its social context, is "a (false) collective noun and attributes (false) universality to it" (Marcuse "Affirmative Character" 94-95). Affirmative culture falsely asserts that a better and more valuable world, which is "essentially different from the factual world of the daily struggle for existence," is "realizable by every individual for himself 'from within,' without any transformation of the state of fact" (95). Beauty then belongs to an ideal world, not to everyday life. Beauty is internalized in an individual without

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changing the status of the bourgeois society. Universal validity and sublime beauty are part of the cultural values of the bourgeoisie (96). "Culture affirms and conceals the new condition of social life" (96). It has constructed universal values everyone is obliged to follow.

Artistic beauty was able to perform this task because of its characteristic: "illusion." [21] It created a "beautiful reality." Through the illusionary characteristic, art consoled the "bad existence" of the poor and satisfied their need for happiness. Their miserable factual life was made bearable with the promise of beauty in the ideal world. Only art, not philosophy nor religion, achieves this "illusory reality," according to Marcuse (Marcuse "Affirmative Character" 119-120).

Peter Bürger observes that religion also has the characteristic of illusion. However, it also contains an element of truth: "it is 'an expression of real wretchedness'" (Bürger 7). It does not hide the misery of reality. The fault of art lies in this. Art uses the power of illusion to hide the miserable reality of everyday life.

This is the fallacy of artistic beauty in affirmative culture. "[T]he enjoyment of happiness is permitted only in spiritualized, idealized form." However, "the ideal cannot be enjoyed," therefore "idealization annuls the meaning of happiness" (Marcuse "Affirmative Character" 119). Marcuse calls the bourgeois system of artistic beauty a "miracle of affirmative culture... the injection of cultural happiness into unhappiness and ... the sickness of that life to a 'healthy' work capacity" (122).

On a personal level, artistic beauty satisfies individual needs that are repressed in daily praxis, but because "this experience remains without tangible effects... it cannot be integrated into that life" of the individual. This lack of tangible effects "...characterizes a specific function of art in bourgeois society" (Bürger 12).

In this miraculous function, art became an institution with universal cultural values, and it served as a cultural frame to sustain the status quo of bourgeois society. The gap between life and art became a problem.

Since art was part of institutionalized culture, it was important for avant-garde artists to rescue art from the institution and to bring it back to life. With subtle differences in their ideal visions and political attitudes, they shared a common interest in denying the position of art in society as an authentic agent of culture. [22] This was the common theme of the avant-garde movements of Dadaism and its descendants. [23]

Dadaists posed a nihilistic, irrational, and cynical attitude towards the prevailing standards in art. Duchamp's notorious ready-made objects are typical. The artists of Happenings and Fluxus employed performances and events - ephemeral forms of art. The former attempted to diminish

the hierarchical line between artists and audience, and the latter attacked the status of high culture. The Situationist International is among the most political of art movements. The artists tried to construct a new urban environment for workers and marginal social members. In this effort, détournement was one of their main methods. With détournement, an artist does not create anything herself, but uses what is available from pre-existing aesthetic elements and subverts its original purposes. As Guy Debord stated in its definition, détournement was one of their political tactics rather than a way to create artwork:

"...there can be no situationist painting or music, but only a situationist use of those means. In a more elementary sense, détournement within the old cultural spheres is a method of propaganda, a method which reveals the wearing out and loss of importance of those spheres" (Debord).

The Situationist International and open work share similar political yearnings: getting away from the established totalitarian culture, and merging art and life. However, their artistic executions went in different directions. Open work concentrates on breaking from the dictatorial relationship between artist and audience, and on creating diverse meanings of artwork. By proposing open art to an audience's responses, "it challenges its recipient to make it an integrated part of his or her reality and to relate it to sensuous-material experience" (Bürger Foreword: xxxix). It holds artistic creation as an ultimate goal within the realm of art.

In contrast, the Situationists used art as a means of revolution. Art became a propagandistic tool. There is a danger for art, when it becomes a means for external purposes. Like advertising, it is turned into a commodity, and its essence is distorted by its usage. For the Situationist International, art was simply a generator of political messages.

Here, let us pay attention to Eco's examples of open work. Even though he tried to examine open work in various areas, his ideas come from his point of view as a Modernist. Bürger differentiates the Modernists from the avant-gardists in his theory of the avant-garde.

"If we focus on the precarious status of art in modern societies - the 'institution' of 'art' - we can see the radical difference between the strategies of negation within modernism and within the avant-garde. Modernism may be understandable as an attack in traditional writing techniques, but the avant-garde can only be understood as an attack meant to alter the institutionalized commerce with art. The social roles of the modernist and the avant-garde artist are, thus, radically different" (Bürger Foreword: xv).

It is often regarded that the first World War was the cause of divergence from modernistic art. The Modernists, before the war, believed in progressive change in continuity with the past, even though they rebelled against traditional values. Jürgen Habermas finds the beginning of modernity with the philosophers of the Enlightenment in the 18th century, and sees Modernism as part of

"the project of modernity" ("Modernity" 8-9). The Enlightenment thinkers expected that the arts and sciences would enrich everyday life. [24] This optimism was shattered during the 20th century. The Great War brought radical change in the characteristics of modernism; the modernists showed their anger and disgust through complete rupture with the past. Their attitude was formed by seeing the madness of the war, and that changed the nature of Modernism.

While Modernists tried to reform the methods of art, avant-gardists attempted to revolutionize the existing social conditions of art, which put art itself in question. The modernists didn't intend to abolish art, but to alter it. However, the avant-gardists attempted to revolutionize the external conditions within which art existed, and established art had to be abolished. The problem with this is that the avant-gardists tried to demolish the prevailing art with the audience still inside. The audience was not ready to move from the standard art to the new art. This nullified the avant-gardist idea of merging art and life: bringing art back to the audience. The audience was scattered and lost, so there was no audience to stand with the new art.

Habermas also points out the reasons that the avant-gardist attempt of merging art and life failed. He sees the avant-gardists' attack on institutional art as an act of shattering "the containers of an autonomously developed cultural sphere... Nothing remains from a desublimated meaning or a destructured form; an emancipatory effect does not follow" (Habermas "Modernity" 11).

Open work was more suitable for the Modernist reformation, but not for the avant-gardist revolution. Open work operates is that it balances pre-established norms and new ideas, and uses them as a tool to position the audience. The artist has to juggle with the norms of standard art and the new ideas of new art until she finds a point of balance for the audience. Since avant-garde artists don't have the standard arts to balance against their new ideas, the structure collapses and open work cannot be established.

Habermas points out the Surrealists' mistakes, that they neglected the elements involved in communicating with the audience: "...cognitive meanings, moral expectations, subjective expressions and evaluations." This applies to other avant-gardists of the time. "Communication processes need a cultural tradition" and all these elements must relate to one another within that tradition (Habermas "Modernity" 11). Even if the avant-garde movements had succeeded, it would have replaced only one sphere of culture: art. [25] The fault of the bourgeois culture was on a super-structural level which was external to art itself. Audiences should be understood in a broader scope, not just in regard to art.

The avant-garde artists made a mistake by removing the boundary between artist and audience. They misunderstood the role of audience in the process of making art, and neglected that it is different from the artist's. The artist conceives the artwork and gives it over to the audience. Then the audience integrates it into their reality. Habermas differentiates two aspects of art, art in its

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autonomy and art in life. Both should coexist to produce art. Artist and audience belong to separate stages of the process. While artists can stay solely in the realm of art, the audience of layman lives in all cultural spheres. Once aesthetic experience goes into a life-historical situation, it becomes something different from that of the aesthetic critic (Habermas "Modernity" 12).

It is possible to reconcile art and life through open work. However, this new connection, "modern culture with an everyday praxis," must take a different direction from traditionalism, modernism and avant-garde. Learning from the history of open work as it was used in these two art streams, we should find a way to use open work in the context of our time. This paper has that ambition, and the use of open work in Interactive Art will be introduced in the following chapters.

CHAPTER 4. RETHINKING OPEN WORK IN INTERACTIVE ART

A key distinction between interactive media and conventional media is the introduction of computational processes in making art. Lev Manovich mentions "algorithmic manipulation" as a major part of digital media. "[M]edia becomes programmable"; an artist can create an automated system with the medium, and the medium operates on its own with its programmed rules (Manovich 27). As an example, Harold Cohen's "Aaron" creates an artificially intelligent system for creating art: a "high-level" automated drawing machine. [26] It generates drawings automatically in an unpredictable manner. I don't propose Aaron as an example of interactive arts or interactive media. It operates on its own with its inner logic and does not require external triggers; there isn't any kind of interactivity. However, this is a good example of a programmable computing system operating as a kind of art.

Figure 5: Aaron's drawing
Source: © Harold Cohen, re-published by permission

While "low-level" automated interactive media merely execute functions with prepared templates and rules, as in Photoshop filters, "high-level" automation requires a computer to interpret the inputs and generate its own behaviour in response (Manovich 32). Margaret Boden explains the grammar of Aaron's body. "This specifies not only the anatomy of the human body (head, trunk, arms, legs), but also how the various body parts appear from different points of view or in different bodily attitudes. So a flexed biceps will visibly bulge, and an arm pointing at the viewer will be foreshortened" (Boden). The drawings are emergent. Aaron doesn't draw the same drawing twice; each drawing is individual just as in real life.

Whether it is low-level or high-level, the programmable nature of an interactive artwork allows it to execute programmed commands over a certain time, and that produces changes in the computing device and the artwork. Most of the time, an Interactive Art computing device resembles an intelligent object. In most cases it is triggered by external signals, such an audience's physical input or data from the internet, and it responds with sound, images or movements. The artists of Interactive Art use this particular quality of the media to create artwork in a state of continual change. This opens up a different role for the audience.

The audience participation in Interactive Art is slightly different from Eco's idea. While Eco holds that an audience can participate in the production of art by generating various understandings of artwork, the audience in Interactive Art is expected to alter or initiate the events of the artwork with direct physical input: touching, moving, making sounds, clicking a mouse or typing on a keyboard. The audience in Interactive Art takes on a physical role in producing the artwork, unlike the audience of Eco's "open work."

Some artwork in interactive media is designed to interact with external conditions other than audience's direct input. Those external conditions could be data from the internet, data from the environment, or an inexhaustible variety of other possibilities. A computing system can extract data from the environment and use those data as parameters to influence the artwork.

I will now clarify how Eco's open work is interpreted in Interactive Art. In earlier chapters, I distinguished between contemplative openness and structural openness. The former refers to multiple meanings of artwork in the audience's interpretation, which is the direct definition of Eco's open work; and the latter implies openness in the physical work of art - perceptible alteration in the medium. Even though Eco mentions the unique openness in Mallarmé's Livre, Eco considers only contemplative openness in his definition of open work. However, the open work of Interactive Art has two layers of openness: contemplative openness and structural openness, and the structural openness distinguishes interactive media from other media.

As in Mallarmé's Livre, Kaprow's 18 Happenings in 6 Parts, or a hypertext novel on the internet, structural openness forms a different shape for each viewing or performance, and the audience

Figure 6: Different subcategories of open work

| Contemplative Openness | Contemplative Openness |
| Structural Openness |
| AUDIENCE | AUDIENCE |
| ECO's OPEN WORK | OPEN WORK in INTERACTIVE ART |
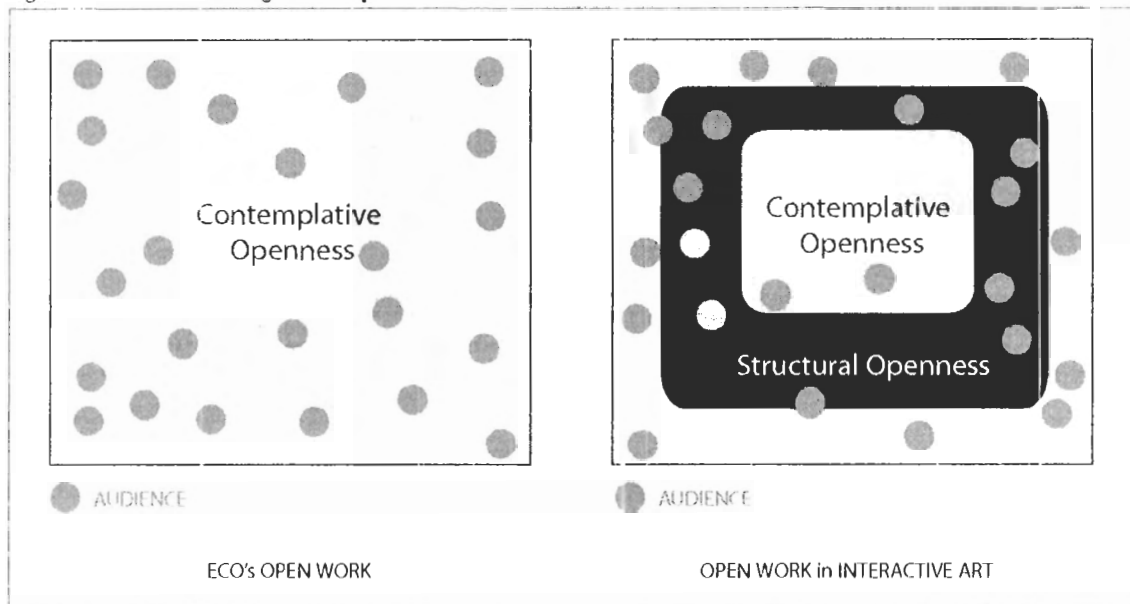
Source: © So-young Park, 2006

will have different understandings of the work each t me. The meaning of contemplative open-ness is not fixed, and neither is the presentation of structural openness.

Structural openness corresponds to the early avant-garde artists' effort to avoid the traditional concept of art object, the "authentic" object. Eco's "work in motion" (opere in movimento) is realized when the actual physical material of artwork is in constant change, not just in an audi-ence's perception.

However, an audience's physical involvement in the process and the resultant changes in the media cannot, alone, comprise Eco's ideal of open work. In order to become open work, these changes in the media must allow the audience to create multiple layers of meaning, and thus become contemplative openness. Making meaning happens in one's mind, and all open work must contain the component of contemplative openness, including Interactive Art. The point of Eco's "open work" is in generating multiple meanings. Structural openness can allow multiple possibilities of interpretation in an audience's mind, but by itself is insufficient. Structural open-ness should contribute to contemplative openness, but it cannot replace it.

In a similar note, Inke Arns defines this quality of interactive media with three characteristics; "immaterialization, process and participation" (8). These focus on processes, events, and the audience's experience; they do not aim at producing a particular artistic object. Arns stresses "communicative" occurrences between the participants.

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He introduces Robert Adrian X' s "The World in 24 Hours" as an example: this is a worldwide network project which began at noon on September 27 and ended at noon on September 28 (1982). Artists from all over the world were connected in a nonstop series of dialogues for 24 hours, exchanging their artwork. This project was possible because of advanced communications technology. Mail art was a predecessor of this kind of project, although X's project concentrated on the connections between artists and did not leave any kind of physical residue, unlike the postcards of Mail art. Neither X's project nor Mail art could expand the network to include wider audiences. However, we can regard artists themselves as a kind of audience, so the concept of open work still applies.

In this chapter, I posit five characteristics of Interactive Art that satisfy the requirements of open work: temporality, changeability, non-linearity, audience participation and remediation. The non-linearity of Interactive Art provides audiences with different trajectories of experiencing artwork. Changeability refers to the constant physical change of the artwork: the environment in which the audience stands. This is related with temporality, which focuses on the audience's temporal experience and the ephemeral quality of the artwork. The audience's experience is shaped by the rhythms of events. Remediation is the tendency of digital media to resemble and replace the functions of old media. It lies in the balance between the uniqueness of digital media and its references to old media.

A. Temporality

Interactive Art emphasizes the temporal experience of artwork. This temporal experience is somewhat different from Calvino's "rhythm" in narrative. The audience of Interactive Art goes back and forth between the virtual space of interactive media and their reality. This transition is usually triggered by the audience's bodily movements or by external conditions. Jay David Bolter and Richard Grusin explain it by hypothesizing two stages of mind in relation to interactive media: immediacy and hypermediacy (Bolter and Grusin). An audience's experience consists of oscillating between immediacy and hypermediacy.

Immediacy can be regarded in parallel to the "trance" of traditional art, and hypermediacy to Brecht's "alienation." Immediacy makes the interface of interactive media transparent, and the audience can pass through it to the illusion of the artwork (Bolter and Grusin 21). This can happen when the audience feels at ease with the medium. Desktop metaphors, such as the trash can, folder and inbox, relate the computer to an office environment. At the beginning, it helped people to get used to the interface of the computer. The interface has become familiar to people, and they don't pay much attention to the medium itself (Bolter and Grusin 23). Another example

of immediacy is when an audience watches a movie in a theater; they are not aware that they are watching moving images on the screen. They are immersed in the story.

In contrast, "hypermediacy makes us aware of the medium" (Bolter and Grusin 34). The audience ceases to remain in the imaginary world of the artwork. Modernist montage made cut-and-pasted print material noticeable. The pop-up windows or hyper linked pages of interactive media can do this as well. As a Brecht play penetrates the "fourth wall" and confronts the audience, the artwork of interactive media ruptures the illusion and forces the audience to read the medium itself.

Consider the example of internet browsing. The audience contemplates material inside the browser window. Then, at any moment, they come out of the contemplative world inside the window and confront the interface, moving around the windows, jumping from one window to another window and so on. Their experience is a collection of these fragments of immediacy and hypermediacy, and this is how they make their own stories.

Calvino discusses the importance of rhythm in narrative. He compares telling a story to riding a horse: the horse is an emblem of mental speed (Calvino Six Memos 39). Rhythm in a story is composed of events in sequence, and it is characterized by manipulating the continuity and discontinuity of time. One has to know how to join one event to another, and to break off at the right moment. In a way, the audience's experience is similar to a narrative, and the flow of the narrative takes them back and forth between illusion (immediacy) and reality. The artist of interactive media should craft the temporal rhythms of this narrative between the poles of illusion and reality. In most cases, artwork in the Interactive Arts is disorientated by too much interruption. The noise of interruption has to be meaningful as part of the artwork, rather than just unnecessary noise, and to contribute to the artistic intention of the work.

In her work, Stock Market Skirt, Nancy Paterson uses stock market quotes in real time to control the length of a woman's dress. The external interruption of the real-time quotes is essential to construct the concept of woman as an object and consumer in society, as opposed to men who steer the economy (Paterson).

This work is based on "the theories of Desmond Morris and Helmut Gaus that women's clothing follows economic activity. In times of crisis and deflation, hemlines are lowered and colours disappear, in times of growth and at the height of a business cycle, skirts (and pants) are getting shorter and clothes more colourful." The cacophonous interruption of stock market data keeps reminding the audience of the message in the artwork.

With interactive media, audience is in the "here" and "now." The constant change and interruption remind them of their reality, and interactive devices force them to make choices. That makes it impossible for them to constantly contemplate the artistic world. It is up to the artist's fine

craftsmanship to position the audience between the two worlds of reality and artwork.

Figure 7: Stock Market Skirt

Source: © Nancy.Paterson, 2004,
re-published by permission

B. Changeability

Lev Manovich proposes that "variability" and "modularity" are two of the main characteristics of new media (36). "[Media elements] are assembled into large-scale objects but continue to maintain their separate identities" (Manovich 30). They can remain discrete, and "can be assembled into numerous sequences under program control" (36). When a large number of elements are used, the number of possible variations is astronomical. Each media element, such as an image or a sound, can be modulated and replaced, and putting these in sequence will generate many different possible events. When those media elements are generative and emergent, as with "Aaron," the huge number of possible variations make the results unpredictable.

David Rokeby's Seen is a visual installation in an emergent environment. The work uses Piazza San Marco in Venice as the source material, and creates a combination of moving images and stills: the people milling about the piazza and the famous San Marco pigeons comprise the moving part, and the architecture of the piazza and the kiosks selling souvenirs comprise the still part (Rokeby). [27] The moving images leave their own traces with a motion delay function (at a delay of 1/2 a second). Borrowing Rokeby's description, they recall Muybridge's motion studies The images create "a strangely archaic mood of the 17th century" (Rokeby). The artist can control the color and texture of the images, but what is on the screen is unpredictable.

Figure 8: <u>Seen</u>
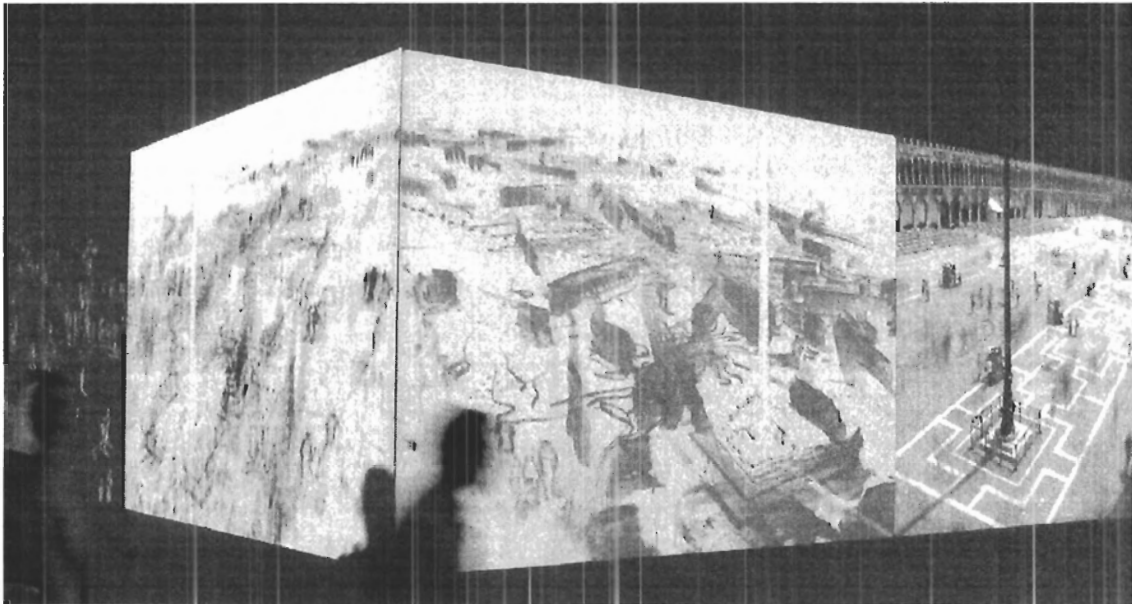
Source: © David Rokeby, 2002, re-published by permission

In his work, <u>Lost</u>, Mark Brady skillfully transforms data from the net into sound bites and visual representations. The work maps people's activities in requesting files in peer-to-peer file sharing programs, based on an open protocol called Gnutella, and turns the mapping into a real-time audio-visual installation. It shows a data stream of "contemporary desire" (Brady). The volume of sound bites and the text size of the queries represent the popularity of the requested files.

Figure 9: <u>Lost</u>

Source: © Mark Brady, 2004,
re-published by permission

In Interactive Art, randomness is often used to alter or exchange the media elements. As in Rokeby's <u>Seen</u>, images on the screen are not pre-determined, and they change according to external sources. These sources are outside of the artist's control, though the artist can have vague notions of what they could be. If the artist had no such notions, it would be pointless to build her device.

Concerning these random changes of media elements, the artist needs a strategy for using them. In Eco's discussion of information theory, meaning and information are not the same. They have different functions in creating art, and an artist cannot choose one over the other; they are both essential for making art. Information is the raw material, and meaning comes from the significant way this material is organized. The degree of openness works on two different levels: for organizing random chaos in order to form information in structural openness, and for organizing the information in a significant way in order to form meaning in contemplative openness. An artist's intention drives this process, making sense of the information according to her artistic vision.

The degree of openness modulates information in structural openness so that the audience can perceive it. No information or too much information cannot win the audience's recognition, so it loses its function as information. The artist needs to organize the media elements in order to bring out the information. Once the information is formed, it needs to be organized in a significant way to form meaning. The degree of openness then modulates the relationships between various parts of the information to create multiple layers of meaning.

Figure 10: Structural openness of open work
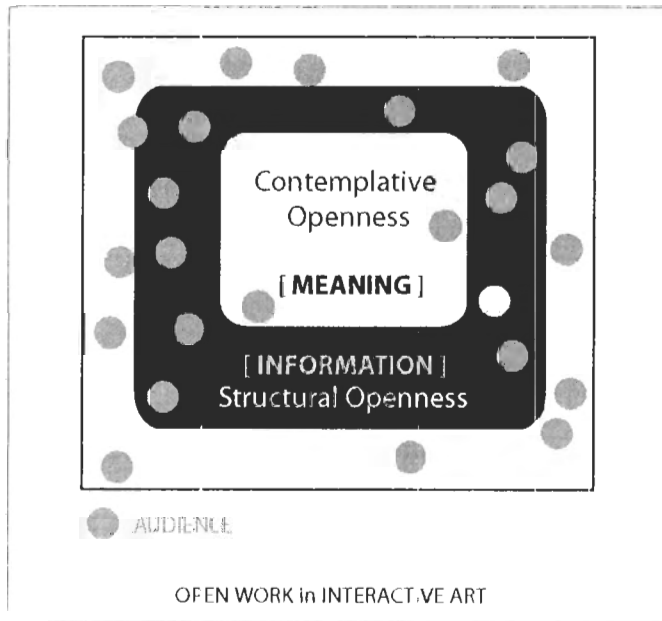
Source: © So-young Park, 2006

Many artists in the Interactive Arts seem to be confused about the functions of indeterminacy in computing systems because they do not properly differentiate information and meaning, and this causes confusion for the audience. A random number or an image of a random passer-by can trigger responses in the artwork, generating sensory elements of sound, image, or movement. However, these are only information, not completed artwork. Their relationships need to be organized for the audience to recognize their significance and form something meaningful.

C. Non-linearity

An audience experiences artwork through a non-linear set of pathways, which generally offer multiple choices, spontaneous changes of path, or improvised reactions. Eric Zimmerman proposes two models for the structure of the interactive media: "content-based or embedded structure" and "system-based or emergent structure" ("Against Hypertext").

In the content-based (embedded) structure, an audience navigates a pre-generated "content." That is, the content is embedded in the system beforehand. The audience might choose different paths as they navigate through the system. However, each path offers only a single experience, since the content was pre-determined. If one wants to have a different path, she has to re-enter the system. However, the second path will also yield only one possible experience. The number of possible paths could be large, but it is finite. A hypertext novel is an example of this. One can navigate in whichever way one wants, but each path provides only one possibility.

This embedded structure is exemplified in Caitlin Fishers's hypertext novella, These Waves of Girls. [28] The overall structure is based on hyper text links, and various media elements of sound and image add artistic enjoyment. The reader is given several hyperlinks per page. She has different options to choose from, but the story that she constructs, choosing those options, is merely one of the fixed paths that the artist prepared. The path was pre-determined by the artist so there is no possibility of unanticipated (by the artist) results.

In comparison, a system-based (emergent) structure has "sets of rules and procedures that result in unexpected experiences and content" and can engender many different experiences from the same set of choices (Zimmerman). A generative system of interactive media belongs to this structure. As in Cage's chance operation, rules and procedures are set in advance, and the system creates unknown possibilities. The artwork emerges from the process and is not predictable, though it follows set rules. The only guide for designing the system is the artist's anticipation of the possible results. Joseph Weizenbaum's famous computer program, "Eliza" (1966), is an example of system-based structure. It simply parses the user's entries by substituting key words into canned

phrases. It works strictly within a given formal grammar, but the key words are provided by the user.

These methods of embedded structure and emergent structure provide only structural openness. Structural openness needs to be supported by contemplative openness or it tends to create stiffness or confusion. When structural openness and contemplative openness work together, the audience will discover the alchemy of multiple meanings.

D. Audience Participation

In Interactive Art, in general, when there is interaction between audience and artwork, the focus is not so much on what the audience would get out of the artwork, but more on how they would get it.

Traditionally, an audience keeps a certain physical distance from artwork. Also they are used to a fixed form of artwork, and artwork in continual change is foreign to them. Interactive Art breaks this custom, and minimizes the distance. Physical contact with artwork or artwork in change should be understood as a significant departure from conventional artwork. This can be an obstacle for the artist, since audiences are not always aware that they are dealing with a different kind of art. However, the meaning of artwork doesn't come from physical contact or artwork in continual change; it is generated by the audience's reception, and physical contact or continual change are simply part of making meaning.

To further elaborate this, consider again the two layers of openness in Interactive Art: contemplative openness and structural openness. Bill Seaman's PhD thesis on "Recombinant Poetics" uses Eco's "open work" as a conceptual basis for developing a creative practice of interactive media that explores "emergent meaning making." He illustrates how his device, "The World Generator/The Engine of Desire," can create meanings. He recalls Eisenstein's practice, in his montage, of juxtaposing two images together to create synergistic meaning from the conflict of those opposing images. [29]

Eisenstein himself called this method "dialectical montage" ("Dialectic Approach"). It was an outgrowth of "collision montage," in which shots of a film were cut together to create meaning not by the mere fact of being in sequence, but by "colliding" with each other in a dynamic way. These collisions were sometimes graphic in nature, using the compositions of the frames and the directions of movement within the frames to set up visual conflict. They could also be semantic, putting ideas in conflict. Or they could be dramatic, putting characters in conflict.

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Seaman utilizes Eisenstein's idea of collision to create openness in the dynamic form of his digital video. However, Seaman's ideas of open work are different from mine in three respects. First, Seaman doesn't specify who creates meaning, artist or audience. Second, he finds open work in the structures of artwork, not in multiple layers of meaning. And finally, he doesn't differentiate contemplative openness and structural openness. The media elements he uses in his device create structural openness, not contemplative openness. His device does not generate meaning, but information. If this is to be open work, the information should be organized to form meaning.

Douglas Gordon's 30 Seconds Text is an example of balance between structural openness and contemplative openness. [30] This installation does not use any kind of computing system: instead, it uses a light bulb on a timer set to go on and off every thirty seconds. However, the simple mechanism of the light relates to the meaning of the artwork. The work consists of a room, painted black, one wall of which displays an account of an experiment performed in 1905 by a French doctor who attempted to communicate with the severed head of a guillotined criminal. After a while, the light goes out and the audience is left in the dark. [31]

I categorize this as having structural openness, even though the changes don't depend on the audience's physical activation; because the artwork is not the text on the wall nor the dark room, but the audience's own experience. An external physical stimulus (a timed switch) causes the initial change. The audience is, however, physically engaged in the artwork. They walk into the room, read the text, and have to decide to stay in the dark or to go out of the room after the light goes out. Also, depending on when they walk into the room, they can finish reading the text or only part of it. The artwork requires their decisions in subtle ways.

The artistic intention is wrapped in the ritual. The artist's fragmented message is scattered through the title, the text on the wall, and the time span of the light bulb. You can only understand the intention of the work, when you assemble all the puzzle pieces. There is a moment when the audience feels connected with the artwork or the artist. It is a reward for the effort of trying to figure out the meaning.

This idea of "figuring out the meaning" relates to the distinction between artist and audience. In my view, the current theories in Interactive Art, which hold that the audience is the artist, are incomplete. An audience can collaborate with an artist in the creation of art, but the their roles should not be confused. Along these lines, Manovich posits the measure of "moral responsibility." Making artwork requires decisions and choices for every detail of the construction: size, format, color, shape, duration, rhythm and so on. "By passing on these choices to the user, the author also passes on the responsibility to represent the world and the human condition in it (Manovich 44).

In a good collaboration between artist and audience, there is joy in being an audience - some-

thing similar to listening to well narrated folk tales or watching skillful shadow play. Artists delight in creating that kind of joy for an audience. When an audience faces a work of art, they hope to discover something they cannot otherwise imagine. They trust the artist and her talent; they want to see through her eyes - her artistic vision. This vision will take different forms in the different minds of individual audience members, and each version will be authentic on its own terms. These versions will take the forms of the multiple layers of meaning inherent in the open work.

E. Remediation

Bolter and Grusin discuss "remediation" along with immediacy and hypermediacy. Remediation is a tactic for approaching audiences with any new medium. It borrows established conventions from old media in order to deliver its messages. Photography borrowed a set of visual conventions from painting in its beginning, and used it until it constructed its own artistic conventions. Similarly, digital media borrows known forms from various areas of art: hyperlink novels from print, interactive (virtual) installation from conventional installation, real-time electronic performance from live performance, and so on. Unlike other radical theorists of new media, Bolter and Grusin point out digital media's fidelity to the older medium's character in order to justify itself (Bolter and Grusin 46). [32] In discussing remediation, they indicate that "the older medium cannot be entirely effaced; the new medium remains dependent on the older one..." (47). Computer games remediate cinema, and the World Wide Web remediates television and print.

This is an important tactic for open work. When approaching audiences by remediating old media, an artist can introduce the unknown qualities of digital media and control the degree of openness in delivering her artistic intention.

Bolter and Grusin are aware of this: "[T]hese [old] technologies remain... as reference points by which the immediacy of virtual reality is measured. Paradoxically, then, remediation is as important for the logic of transparency as it is for hypermediacy" (Bolter and Grusin 48). They push this idea further, and negate the break between digital media and old media. "[L]ike their precursors, digital media can never reach this state of transcendence, but will instead function in a constant dialectic with earlier media... Repurposing as remediation is both what is 'unique to digital worlds' and what denies the possibility of that uniqueness" (50).

One of the unique qualities of digital media is interactivity. The World Wide Web remediates television, but it is not the same as television. While television uses a one-way channel and plays regardless of the audience's attention, the Web uses a two-way channel and does not react with-

out external triggering. Remediation helps the audience to better understand this previously unfamiliar interactivity, by using familiar formats. This reconfirms one of the methods of Eco's open work, usage of the old by the new.

CHAPTER 5. NEW DEFINITION OF OPEN WORK IN INTERACTIVE ART

Eco's "open work" heavily influenced avant-garde artists through the 50s and 60s, but it has not yet become a major force in Interactive Art. This may be due to the heavy technological bias of Interactive Art. Traditionally, artists have to pay a lot of attention to the technological aspects of their medium. In this sense, the medium can be an obstacle to the process of artistic creation. An artist must challenge this obstacle, master the medium, and modify it for her artistic purposes.

In Interactive Art, this relationship between artist and medium has unique properties. The artist of Interactive Art prepares the work by setting rules. This is the case in most open work as well: e.g., the to-do lists of Happenings and the compositional rules of aleatoric music. As Manovich observed, the algorithmic process of Interactive Art makes its medium programmable (27), and programming involves setting rules. But computational processes then endow a computing device with autonomy, making it an independent performer, and the artwork relies on the autonomous qualities of the computing device. This opens up two issues specific to Interactive Art: removing the artist as author, and designing artistic accidents.

The first issue, the artist as author, recalls Benjamin's "aura of artwork," and Barthes's "the author as a human person." If reproduced copies of artwork remove its aura, as Benjamin hoped would happen, due to its mechanical reproduction, the immaterial quality of interactive media might be an extension of that process. The authenticity of artwork comes from "its unique place in a particular place" and "the mark of the history to which the work has been subject" (Benjamin "Work of Art" 253). A work of Interactive Art is not a fixed physical entity; the artwork exists only in the audience's experience. An artist prepares the artwork, and the events of the artwork are then triggered and determined by the audience. However, the artist's responsibility does not stop with this preparation, but also extends to the (partly foreseeable) events which the audience creates.

The second issue recalls the chance operations of Cage and others. These artists used chance operation as a way to discover things outside their knowledge or experience. The random processes within the rules produce unpredictable results, and the artist can use these accidents as part of her art. This process of "accident by design" requires careful control of the rules and of how the random components are integrated in the work, and the artist has to measure the

amount of unpredictability. Artists can develop this process further with the help of computing systems. A computing system plays compositions within the rules specified by the artist; thus, the artist can modulate the unpredictability in the system by altering the programming code. These modulations can define the degree of openness, giving artists of Interactive Art additional control over the amount of openness in the performance of the work. The degree of openness then extends from multiple meanings in artwork into the creative process.

A. Removing the Author and Community of Play

When an audience faces a work of art, they naturally try to understand the intention of the artist. This learned response has been overly formalized in recent art history, and the artist has assumed an authoritarian voice concerning her work. Open work in Interactive Art can remove the shadow of the artist from the artwork and let the work speak for itself. The autonomy of a computing system can have this effect. For example, images on a screen can change with dancers' movements captured by a camera, or with the audience touching the screen.

When a computational process detaches an artist from her artwork, the artwork can evolve on its own. The artist gives a birth to her artistic child and lets it go out to the audience. Mallarmé's cutting-up of pages in Livre is a device of this kind. However, the computational process has allowed this situation to develop much farther.

Bolter and Grusin draw a parallel between a camera and a computing system concerning erasing the "human agency" (27). However, the absence of human agency is greater with digital media than with photography. In the production of photographs, the artist has to operate the camera, compose the frame and capture images. This requires many artistic decisions. While photography requires the artist's presence in creating artwork, interactive media tries to remove the artist's presence. The artist prepares the performance of the computing system, but she may be absent during the actual manifestation of art when the audience interacts with the computer system.

However, this should be understood in a metaphorical way; the artist doesn't disappear but is merely invisible. Her status may diminish, but not the artist herself. Although she may be absent at the final moment of the production of the artwork, her artistic intention is still responsible for the audience's interaction with the media. It is just that her "work" in creating the work of art takes place largely in the first stage of creation. The second stage belongs to the audience. In cases where the audience does not interact with the work, but the interaction takes place between the work and a set of external conditions (such as data from the internet or changes in the intensity of daylight) the artist is still detached from the real-time events experienced by the audience.

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Let's think about "removing the author" from the practical question of the audience's experience, apart from theoretical considerations (such as Benjamin's or Barthes's). How does the audience experience artwork differently when the artist and her aura are absent? The following anecdote might help clarify this question.

I once went to an exhibition by Diana Burgoyne. [33] One of her installations consisted of a small interactive device: a feather stuck to the wall. I watched a boy being drawn toward the feather. As he approached, the feather started spinning. The closer he went, the faster it spun. He was fascinated by the simple movement of the feather activated by his own movement. For him, the most fascinating fact was that he himself was the source of the feather's movement. Significantly, he was free of the authority of the artist, the connotations of the artist, and the history of art. He was transfixed by the feather and his own movements.

In this way, Interactive Art arises from the audience's experience with the physical component of an artwork over a time span, and this implies the need for a performance component. By performance I mean the audience's real-time activity, not some presentation by an actor. Interactive art allows the audience to participate as performers in this sense; they trigger interactive media with their activities. Here we have to ask: what do we want the audience to gain from the experience? To answer, we need to invoke the idea of "play." By play, I mean the audience exercising their freedom in constructing their own interpretations of the artwork.

Situationists used the notion of play as a conceptual tool, as compared to "work" and "employers" of institutional systems such as corporate, government and academic. While "work" transforms humans into "human material" and alienates workers from their labour, play purposes itself; the players find enjoyment in doing it.

Another useful concept in Interactive Art is "community," in the sense of associating with others. This idea of community is not new in the art world. Mentioning "social sculpture," Joseph Beuys was concerned with democracy in art, meaning that it had to be shared by everyone in society. Art then becomes "the whole work of humanity" (Beuys).

The artists of Happenings were, of course, already blurring the boundary between artist and audience in a communal sense. The Surrealists, "Mail" artists and Fluxus performers also contributed to the formation of a community. The Mail artists circulated postcards from one artist to another, each contributing their artistic talent. The Surrealists artists performed collaborations such as the "Exquisite corpse." However, these artists' activities were only for the artists themselves, and didn't include audiences.

Calvino's idea of folktales and Benjamin's idea of the "mimetic faculty" also relate to the idea of "community," but their interpretations are broader and more fundamental than those of the

avant-garde artists. Calvino was keenly interested in folktales and fairytales (Six Memos). Most members of a culture understand the familiar rhythms and patterns of these stories, handed down from one generation to another. This is how individual members of a culture recognize each other and tie themselves together. Benjamin's notion of "play" is permeated by mimetic behaviour, and he believed machines would enhance our sensory abilities, helping us to mimic each other. [34] The concepts of copying and being copied are inevitably connected through the mimetic ritual (Benjamin "Mimetic Faculty").

Expanding on the ideas of play and community, Calvino defines "world soul" as knowledge outside an individual's subjective experience, and he holds that imagination is a means for accomplishing this (Six Memos 91). Open work should stimulate and enhance the individual's imagination, and let her engage in the play of art. The artist is a conductor of this imagination and prepares an environment where people can identify with the idea of world soul.

The Interactive Arts provide enormous opportunities for community and play. However, this does not mean technological innovation alone can provide solutions for promoting a community of play. The real obstacle is the cultural bias of the audience. The audience has been educated to be passive observers by the institutions of art, and by tradition, they are alienated from the artist and from each other. This institutionalization of art has been criticized by many artists including Beuys. The audience needs to free themselves from these cultural biases and regain the uncorrupted eyes of children. [35] Our dominant Western culture has largely lost these capabilities. Although this fault may lie in the culture at large, not just in art, Interactive Art may help the situation. If so, it should start by changing people's relationship with - and their perception of - art.

Interactive media, as a new art form, requires a re-educated audience. They need to construct independent interpretations of the artwork in order to understand it. This independence does not necessarily mean their interpretations are different from the intentions of the artist. The interpretations the audience creates will be closer to or farther from the artist's intentions according to the degree of openness. It is just that those interpretations have to come from the audience's independent experience, not from an art critic nor from the artist's own commentary. The artist should find a balance between her intention and the potential audience's understanding. This is a classical dilemma for all artists, but it is more difficult in Interactive Art because of the need to work on two levels of openness: contemplative and structural.

Calvino's work is particularly valuable here. His five values, lightness, quickness, exactitude, visibility, and multiplicity, comprise his artistic philosophy for the 21st century. They relate well to Arns's definition of interactive media, "immaterialization, process and participation" (8). They aptly describe the desirable qualities of the audience's experience in Interactive Art. This experience should be playful (lightness). It should be economic in its rhythms, and the audience should be able to progress without undue confusion (quickness). The sensory experience should be bal-

anced with finding significant interpretations (exactitude). The audience's imagination should be provoked in a way that lets them create multiple meanings (visibility). Those multiple meanings should branch out in a network (multiplicity). All these values should balance their counterparts: heaviness, lingering, vagueness, verbality, and uniformity.

The instantaneous live art of interactive media uses new codes; for example, the new viewer's moving body can replace the traditional viewer's fixed eyes. The new codes might hold art and its audience together. The audience of open work will hopefully discover the play of their own performance, including recognizing themselves in the reactions of others (community).

In the same vein, Benjamin suggests the aesthetic solution of "tactile reception" for the modern audience ("Work of Art" 268). "Tactile reception" forms by habit, and through this the audience absorbs the work of art. This habit is not personal, but communal; it is formed by shared codes. The artists of Interactive Art must understand the audience's shared codes and allow them to absorb artwork through tactile reception. Interactive technology could advance the task of gathering and connecting, and bring back "our original form of community" (Baldwin 26).

B. The Precision in the Degree of Openness: Anticipating Accidents

In his idea of open work, Eco is mainly concerned with an audience's reception of artwork, and how they create their own meanings in the work. But the artist of Interactive Art can use openness in her own creative process. This can happen in two areas: in the programming of computing systems and in the real-time performance of the program.

The process of creativity is a mysterious, but essential, subject for artists. Surrealists turned to the unconscious, and Cage used chance operation. Both methods aim at gaining artistic inspiration outside of the known and habitual. In the same manner, Interactive Art can use the automated nature of the media to generate meaningful discoveries.

Manovich mentions "algorithmic manipulation" as a major part of digital media. "[M]edia becomes programmable" (27). He also emphasizes modularity in the "fractal structure of new media." By working with modules, an artist can have a set of infinitely variable versions of an object. These modulated objects, images, sounds, shapes, behaviours, pixels, characters, scripts and others, "can be assembled into numerous sequences under program control" (Manovich 36). Since the objects maintain their separate identities, it is possible to manipulate them without damaging the whole system, and the results of manipulation can be predicted within the scale of the object.

However, because the modulated objects are interconnected, and this process is done by automation, one cannot clearly picture the final result of the whole system. Actually, emergent structure would be more suitable for this task than embedded structure. While embedded structure is composed of pre-generated content and produces an expected set of results, emergent structure has contingent elements and produces unpredictable results. This particular characteristic of emergent structure gives an artist the possibility of "Accident by Design." [36] The artist can juggle the anticipated behaviour of individual modulated objects with the unpredictable results of the emergent large-scale system. The fine-tuning of unpredictability is a key requirement in finding the most desirable accidents of open work.

With computing systems, an artist can induce unexpected surprises. The degree of openness can be determined when an artist programs her computing system, in the preparation phase. By controlling the probabilities, an artist can design accidents into the performance. How much the performance diverges from the original composition depends on these accidents.

Using these contingent capabilities of digital media in the creative processes of Interactive Art is not merely "rolling the dice" or "throwing the I Ching" in one of Cage's exercises of chance operation. There are more concepts involved in the contingent quality of Interactive Art than in a purely random process, because there is a selective component.

In Interactive Art, accidents can occur in two areas: first, in programming the computing system (at the level of composition, to make an analogy with music), and second, in the interaction of the audience or other external stimulus with the computing system (at the level of performance). Audience interaction with a system has some of the qualities of a random process, yet it is not purely random (people are somewhat more predictable than dice). Also, there can be a selective component, since audiences can sometimes select from choices offered by the system. So we can call it contingent rather than random. An artist can use her intuition to anticipate reactions from an audience that shares a common culture. Yet audiences are ultimately unpredictable and their interactions can yield accidents.

With computing systems, there can be surprising results even when the artist does not deliberately introduce random into the system. This is because the computer gives you, quite literally, what you ask for; and this is not necessarily what you want or expect. Computer programs have become so complex that it is hard to predict outcomes with absolute certainty.

Obviously, as the artist becomes more familiar with computing systems, she is better able to predict their behaviour in the same way a photographer learns to see like a camera when composing a photograph. The human eye is selective and sees, in a biased way, only a portion of what is in front of it. But the camera records everything in the frame. So the artist trains herself to see every detail in the frame. The artist of interactive media learns the ways computing systems

behave. She can use her intuition to think in the literal way of a computing system and anticipate what results she might get. There will always be surprising results; still, the artist has more control over the unpredictability of a machine than over an audience. For example, if the artist sets a random number between zero and ten, she knows the number will always be one of these ten numbers and will not be larger than ten.

By contrast, the audience's behaviour is not as limited as that of a computing system; audiences are less predictable, which can make the art more exciting. The artist can use an audience's unpredictability as a catalyst in her process. They are not merely passive operators clicking buttons. They can increase the creative exchange between artist and artwork. In order for the audience to be a useful catalyst, they have to be engaged in the process. They should be able to communicate with the artwork and create their own meanings.

Perhaps the least predictable computing systems are Artificial Intelligence systems, which self-program or "learn." There have been arguments concerning the creativity of systems using Artificial Intelligence. Without getting into these arguments, there is clearly a lot of potential if the system becomes part of the creative method through a process of self-design. However, the caution against relying on software applies doubly to intelligent programs: computers give you, quite literally, what you ask for, not what you want. There are serious risks involved in trusting self-programming computers to make art for you.

As of this writing, creative responsibility still belongs to human artists, even when the methods are contingent. And when dealing with contingent methods, it is important that the human artist be prepared to exploit the happiest accidents. As Pasteur observed, "Chance favours only the prepared mind." [37] Accident by design happens best when the artist is prepared for unknown possibilities. The artist of open work rolls the dice with a purpose and with the hope that something extraordinary, beyond her knowledge, could happen. She is prepared to catch it. When one is not ready for the unexpected, even if a miracle happens, one might let it slip away.

The creative process filters and processes novel phenomena and teaches audiences how to recognize them. Designing accidents, then, requires the ability to filter irrelevant noise out of new occurrences and find significant patterns or meanings. These significant patterns and meanings can be the last pieces of the puzzle in the artist's creative mind. When she finds the right ones, the ones she has waited for without knowing what they were, she makes an original, and very personal, discovery. As James F. Stephen puts it, "Originality does not consist in saying what no one has ever said before but in saying exactly what you think yourself."

There is one more essential step in the creative process. In addition to chance operation and selection of the happiest accidents, it is vital to repeat the process of discovery. This allows the artist to understand how these particular accidents happen. If not, the accident can be a one-

time event. Repetitive trials clarify the pattern and its meaning. When she finds stable rules and patterns, she can use them in her creative process.

CHAPTER 6. DISCUSSION

By tradition, artists must master their chosen medium to communicate their artistic vision to audiences effectively. Thus, artists in Interactive Art must learn to work with computers to create their art. This requires much deeper technical study than other media, and has led to a technological bias. There have been a few artists and art theorists who examined open work as a possible solution for the above-mentioned problem of technological bias, and it would be worth while exploring their different views on the subject.

In The Language of New Media, Lev Manovich attempts to place new media within the histories of the visual and media culture of the last few centuries. His encyclopedic explanations define the essential properties of interactive media and digital media. He analyzes social and cultural aspects of the new media, its connection to the traditional media such as film, and the distinctive characteristics of computing systems. Manovich is biased toward the structural aspects of new media, but he does not explore their relationship to audience reception - what and how new media work when the audience perceives new media art. Artists should, I believe, understand the necessary technical processes; but artistic intentions and motivations are also vital. His views are useful in giving an overview of new media but limited in solving its problems.

Janet H. Murray, in her Hamlet on the Holodeck: The Future of Narrative in Cyberspace, also provides a wealth of knowledge on the possibilities of new media in relation to narrative. She mentions the qualities of open work in her description of "The Four Essential Properties of Digital Environments," procedural, participatory, spatial and encyclopedic (Murray 71). She explains that the digital medium is "intrinsically procedural" and embodies "contingent behaviors" with a series of rules. This procedural environment allows "responsive behaviors" of the computer and it becomes "interactive" (74). She adds that the navigational space in the digital environment creates the audience's "dramatic engagement" in narrative (80). A participant, as an "player/interactor," becomes a character in the story, and the event belongs to her and happens now (81). Murray's notions are appropriate for describing narratives constructed within a digital environment; however, her conclusions convey an overly utopian vision of digital technology and an assertive version of technological determinism.

Along these lines, Söke Dinkla, in her article "The Art of Narrative: Towards the Floating Work of Art," proposes a similar concept of digital art production that relies on Eco's ideas. She describes non-linear narrative forms of interactive media in a continual process of transformation. According to her, the new aesthetics of interactive media allow the audience to navigate freely "through fields of meaning, where there is no temporal sequence and only momentary hierarchies" (Dinkla 37). She mentions that ambiguity and multiple interpretations are key concepts, which puts her in agreement with Eco. Her emphasis on the interaction and imaginative engagement of the audience in the construction of meaning recalls Eco's original idea of audience participation.

Concerning the relationship between open work and interactive installation, Céline Pourveur articulates two ways of understanding Eco's "open work": openness in interpretational freedom, and openness in narrative freedom (Pourveur). With the examples of classical literature, such as Homer's Odyssey and the works of Sophocles, Pourveur nullifies the validity of interpretational freedom as open work; even the "universal" works of art by Homer were intended for a specific audience.

She finds legitimacy of openness in narrative freedom, which Eco was most concerned with in his "open work." She speculates "[n]arrative freedom means that changes are made to the work on a structual level, unlike interpretation, which doesn't affect the composition and 'intergrity' of the work. With narrative freedom, the author has envisioned his work of art in such a way that changes need to be made, in order to appreciate the meaning of the artwork to the fullest." This idea emphasizes that structural openness is an innate characteristic of interactive media. However, Eco's concept of a field of multiple meanings is absent in her "openness" of open systems. She defines "openness" in relation to a system of artwork, but it is not directly related to an audience's reception of that artwork.

"Meta design" is a new approach to the theory of designing interactive systems (Fischer and Giaccardi), which shares some of the qualities of open work. The basic idea of meta design comes out of the frustration that humans are treated as mere consumers of interactive systems, not as creative operators. It aims to invent environments and cultures in which humans can express themselves and engage in personally meaningful activities. This approach can be useful in the construction of open work up to a point; however, it is incomplete for an artist. It is based on the functional criteria of objectives and solutions in the process of design; but making art requires more levels of significance than design, since it originates from an artist's vision - an artist's way of extracting meaning from the world.

As in any other kind of art, expressing an artist's vision is a process of constant negotiation between that vision and its readability by the audience. This is more difficult in Interactive Art, because the audience is not yet familiar with the new medium nor with the concept of openness in artwork.

A note of caution applies here: having too many meanings in artwork can be problematic. Cage's work is notorious for this. His comment on the audience's limitations when he talks about "dismantling of 'normal' syntax" is typical. Marjorie Perloff explains that Cage felt Joyce's Finnegans Wake was not unconventional enough in that respect, citing the foreword of Cage's "M2."

"Syntax gives it a rigidity from which classical Chinese and Japanese were free. A poem by Basho, for instance, floats in space . . . . Only the imagination of the reader limits the number of the poem's possible meanings" (Perloff "Music").

It is up to the artist to choose how much she wants the audience to understand the work, and how to set the degree of openness. Referring to Cage's comment, I ask these questions: what if the audience does not understand Chinese or Japanese, and what if their imagination is not developed enough? If the audience cannot understand the possible meanings of artwork because of their limitations, shall the artist blame the audience or blame the communicative qualities of the artwork? Then, how much should the artist try in order to have her work readable by an audience, and how much should she compromise her artistic visions?

There cannot be simple answers for these questions, and each artist should find answers for herself. However, these questions are important in order to measure how she should set the degree of openness. The answers will affect the power of the artwork.

CHAPTER 7. FINAL NOTES

Open work is an old idea which developed within the various movements of the early avant-garde, who were yearning for social change. The avant-garde artists made the audience aware of certain critical situations, and raised the status of art. However, open work has often been used poorly and has become part of some official aesthetic dogmas. Unfortunately, the avant-gardist ideal seems to have not reached its ultimate goal: joining reality and art; although the rebellion of anti-art in the early 20th century survived even after the 1960s.

Dieter Daniels sympathizes with this situation. "[T]here was an increasing sense of resignation about what were now called 'the mass media,' and considered a lost cause for culture. Individual artists were working on alternative models so that they could win the media back at least symbolically, but without in any way being able to change the commercially and politically slanted media as a whole" ("Forerunners" 5). A more serious problem is that the audience has been neglected and alienated from art in this process.

I have proposed open work as a systematic tool for making artwork in Interactive Art, and expanded the notion of audience participation, with the hope of bringing audiences back to the enjoyment of art. This enjoyment comes from the audience sharing and developing ideas in collaboration with the artist. Artists can initiate this process by using openness in constructing meanings in the artwork. This idea has to be understood as part of the artistic process, not from the audience's point of view.

Eco considers the audience's cognitive processes in understanding artwork, which he calls "openness of first degree," as a foundation for the "ever-changing profiles and possibilities" in the open work process of the artist, which he calls "openness of second degree" (74). In this paper, I have focussed on this openness of the second degree, the process of making open work, mostly excluding the psychology of the audience's interpretation of the work. Thus, my paper is aimed at artistic decisions in the process of open work and how this can be used by artists in the Interactive Arts.

The "deliberate disorganization" of open work lets the audience create their own interpretations of the work. The collection of these interpretations constitutes the multiple layers of meaning.

Artists express their originality in this "deliberate disorganization." This requires measuring and adjusting *"its improbability in relation to a precise system of probability,"* which makes the artwork more informative and meaningful (Eco 54). This measurement of improbability defines the degree of openness of the artwork.

Meaning itself does not construct artwork. It can motivate the creation of artwork by the artist or its enjoyment by the audience. However, the quality of art lies in how the meaning, the artistic intention, the artist's vision, is presented. When an audience sees or experiences artwork, they expect something that they themselves could not have independently imagined. It does not have to be new knowledge, but it is about learning and discovering new ways of looking at life and the world. The way that the audience makes the discovery depends on how the artist's vision is presented. The individual minds of audience members arrive at different levels of discovery.

Calvino's five values, lightness, quickness, exactitude, visibility and multiplicity, correspond to the unique qualities of "immaterial," "procedural" and "participatory" in Interactive Art, and provide methods of measuring the degree of openness. Calvino explains these five values through various examples. They are valuable for artists in the new millennium.

Interactive Art is becoming an increasingly bigger part of the art world and people's lives. It has the potential to expand the audience for art and to help form a sense of community between and among artists and audiences. This can help people find a sense of balance and harmony in life. Artists can find new forces in the unique environments of interactive media to drive their creative processes. Just as the artists of chance operation sought fresh discoveries with indeterminate procedures, the artists of Interactive Art can encounter new revelations in the more controllable yet more complex unpredictability of computing systems.

The high technology of Interactive Art tends to distract us from our original purposes. We need to remember the modernist optimism of merging art and life. Borrowing Habermas's idea, we are still in the project of modernity, even though it was interrupted by two disastrous wars. Perhaps we can revive the optimism toward technology that was common before the wars. This has to be done with caution. Examples of the misuse of mechanical reproduction are plentiful, including Fascism in the last century. Benjamin's wish for wide distribution of art was realized, but in a deformed manner: mass production has promoted empty consumerism, and individuals are left with only cheap, alienated material goods.

Artists in Interactive Art always have to remember their roles as artists. The novel language of the new media will allow us to cultivate our understanding of art with new perspectives and to the benefit of everyone.

Benjamin's comments on Klee's painting, <u>Angelus Novus</u>, is relevant to the moment: "[The angel]

seems about to move away from something he stares at.... His face is turned away toward the past. The angel would live to stay, awaken the dead, and make whole what has been smashed. But a storm is blowing from Paradise and has got caught in his wings; it is so strong that the angel can no longer close them. This storm drives him irresistibly into the future, to which his back is turned, while the pile of debris before him grows toward the sky. What we call progress is *this* storm." ("Concept of History" 392)

There is no choice but to go forward, but we will keep asking ourselves the original question, why we are doing this. Without this question, we might be caught in another wreckage, and the reconciliation of art and life, and artist and audience, will be pushed back.

NOTES

1. In The Open Work, Eco uses the word "modern" in a rather general way, but art-historically it refers to the movement of Modernism.

2. "The sounds themselves will consist of unusual frequencies that bear no resemblance to the more familiar musical note and which, therefore, yank the listener away from the auditive world he has previously been accustomed to. Here, the field of meanings becomes denser, the message opens up to all sorts of possible solutions, and the amount of information increases enormously. But let us now try to take this imprecision-and this information-beyond its outermost limit, to complicate the coexistence of the sounds, to thicken the plot. If we do so, we will obtain 'white noise,' the undifferentiated sum of all frequencies-a noise which, logically speaking, should give us the greatest possible amount of information, but which in fact gives us none at all. Deprived of all indication, all direction, the listener's ear is no longer capable even of choosing; all it can do is remain passive and impotent in the face of the original chaos. For there is a limit beyond which wealth of information becomes mere noise" (Eco 96). A limit refers to the maximum point of a free form.

3. Eco borrows mathematical equations from information theory to make his point. The concept of 'entropy' is important in information theory, though it derives from thermodynamics. Concerning work done by energy, the second law of thermodynamics states that energy can only do work according to how well it is organized, and that as it performs work, its organization decreases proportionately to the amount of work done. Thus, a system will naturally degrade to a less ordered state as work is done, until there is no more energy available to do work. Entropy, then, is a measure of the unavailability of energy to do work, and also, therefore, of the decrease of order in a system. An increase in entropy implies the development of a less ordered state (Eco 46-49). Most thinkers in information theory relate information to order, which is fine as far as it goes; but then they tend to go on to treat information and meaning as much the same thing, and Eco does not agree with this conclusion (52).

4. Calvino was preparing 6 lectures at Harvard University in the United States. 5 of the 6 lectures were finished, and he passed away on September 19, 1985.

5. It is problematic to distinguish felt thought and written thought, and the latter has taken a more dominant position in academia. Often, felt thought is related to a phenomenological method. Knowledge is gained from one's own point of view via her "lived experience" (Merleau-Ponty). To Merleau-Ponty, perception is itself intrinsically cognitive (Phenomenology ix). He cautiously suggests describing perception as a phenomenological method (Phenomenology viii). While analyzing or explaining, a subject ceases to remain part of her experience; describing, by contrast, requires her to relate to the world and perceive it. As a pre-requisite, she becomes aware of herself as the subject of observing and describing, and experiences herself "as existing in the act of apprehending it" (Phenomenology ix). Then, she can describe her experience in relation to the world.

6. Samuel Taylor Coleridge in his Biographia Literaria coined the term, "suspension of disbelief"; "... it was agreed, that my endeavours should be directed to persons and characters supernatural, or at least romantic, yet so as to transfer from our inward nature a human interest and a semblance of truth sufficient to procure for these shadows of imagination that willing suspension of disbelief for the moment, which constitutes poetic faith" (Chapter XIV).

7. This idea is linked with one of Brecht's theatrical techniques called, "Breaking down the fourth wall."

8. As in Eco's example of Mallarmé's Livre, the idea of open work was already conceived before the 20th century. However, the paper will concentrate on the 20th century, and draw a closer connection between open work and Interactive Art.

9. The background story of why Eco emphasizes the importance of openness in artwork is interesting. Eco rebelled against "the Crocean aesthetics that dominated the Italian academic world in the early sixties" (Eco Introduction: Viii). Crocean aesthetics held sway over Italian intellectual life through the Fascist period and for the first two post-war decades, and it seemed to be suitable for the time. David Robey summarizes the phenomena in the introduction of The Open Work.

"Art for Croce was a purely mental phenomenon that could be communicated directly from the mind of the artist to that of the reader, viewer, or listener. The intuition and expression that constituted the essence of the work of art was thus an unchanging entity; it also necessarily possessed unity, which Croce tended to speak of as a dominant lyrical feeling or sentiment. The material medium of the artistic work was of no real significance; it merely served as a stimulus to enable the reader to reproduce in him- or herself the artist's original intuition" (Introduction: Viii).

10. From the Box of 1914 at The Art Institute of Chicago; in Arturo Schwarz' Duchamp Catalogue Raissoné (Revised edition, New York: Delano Greenidge Editions, 1997). This picture is my version of "Note 96."

11. The process of 3 Standard Stoppages is well illustrated as animation on Andrew Stafford's website. http://www.understandingduchamp.com/.

12. As in his other pieces, Duchamp's 3 Standard Stoppages contains an ironical joke. Without understanding it, the work cannot be explained. Please read the actual mode of manufacture of the work along with Duchamp's claim in:
http://www.toutfait.com/duchamp.jsp?postid=677&keyword=#N_1_top.

13. Chance operation is often confused with aleatoric music. Indeterminacy in music is represented by three main tendencies: Chance music, Aleatoric music, and Stochastic music. These three categories are distinguished by the level on which the indeterminacy happens. The indeterminacy of chance music happens during the composition. Once a work is composed, the score is followed exactly the same way as all traditional music scores. In contrast, in aleatory music, indeterminacy happens at the level of performance. The performer is asked to make certain decisions for the piece during the performance. Stochastic music involves indeterminacy at the level of composition, but uses strict mathematical tools (stochastic distributions) (Tipei). Random plays a role in this process, but it does not apply to the whole process of composition.

14. These examples are from John Cage's mesostics.

15. It was presented at the Reuben Gallery, in New York, in the fall of 1959.

16. Marcel Duchamp is credited for the initial idea of Mail art, when he circulated his ideas by postcard in 1916 (Spencer 129).

17. Authenticity in open work should be differentiated from that of art in Benjamin's notion. Benjamin based his idea on the reproduction mode. He refers to the physical body of artwork. A copy of artwork and the original are separate, and the authenticity belongs to the original. By contrast, authenticity in open work derives from the meaning of the artwork, not so much from its physical body. The artist creates it, but it grows in the audience's reading. In contrast to Benjamin's idea, the authentic meaning in open work develops and grows in its passage from the author to the audience.

18. Eco finished Opera aperta (Open Work) in 1962; and The Open Work, the English version of Opera aperta, was published by Harvard University Press in 1989.

19. "What does the name of an author on the jacket matter? Let us move forward in thought to three thousand years from now. Who knows which books from our period will be saved, and who knows which authors' names will be remembered? ... or perhaps all the surviving books will be attributed to a single, mysterious author, like Homer" (Calvino Winter's Night 101).

20. The term "avant-garde" in this paper is associated with the radical art movements of the specific historical period that runs from the second half of the 19th century till the mid-point of the 20th century. Eco uses the term in a broad sense: artists and artwork that are novel and experimental. However, in the context of this fin de siècle shift in art, his ideas also belong to our own particular definition of "avant-garde."

21. "Only in the medium of ideal beauty, in art, was happiness permitted to be reproduced as a cultural value in the totality of social life. ... [Two areas of culture, philosophy and religion could not represent ideal truth.] In its idealist trend, philosophy became increasingly distrustful of happiness, and religion accorded it a place only in the hereafter. Ideal beauty was the form in which yearning could be expressed and happiness enjoyed. Thus art became the presage of possible truth" (Marcuse "Affirmative Character" 117).

22. Walter Benjamin considers the authenticity of artwork in "The Work of Art in the Age of Its Technological Reproducibility." He foresees that mechanical reproduction will eliminate the authenticity of art which limits itself to the bourgeoisie, and the wide distribution of artwork by mechanical means will allow ordinary people to access the artwork.

23. Eco's "open work" comes slightly before Happenings and Fluxus, and foreshadowed the second wave of these avant-gardists.

24. According to Habermas, it was believed that the three autonomous spheres of science, morality, and art would be handled under the control of specialists with their expert knowledge. However, what really occurred was a growing distance between the culture of the experts and that of the larger public, and the specialized treatment and reflection of the experts did not immediately and necessarily become the property of everyday praxis (Habermas "Modernity" 9).

25. Habermas borrows Max Weber's characterization of cultural modernity. The substantive reasoning expressed in religion and metaphysics is separated into three autonomous spheres: science, morality and art.

26. I employed "Aaron" to illustrate the automation of interactive media, but Artificial Intelligence is not relevant to this thesis.

27. Seen was commissioned for "Next Memory City", the Canadian Pavilion of the Venice Biennale of Architecture 2002. <http://homepage.mac.com/davidrokeby/seen.html>. The video was recorded in advance and projected, instead of a live video stream, due to the extraordinary expense of running a live satellite.

28. http://www.yorku.ca/caitlin/waves/

29. Referring to two or more parts which, when taken together, form a whole greater than the sum of the parts.

30. "Douglas Gordon: New Works and Off-Site Projects" was held at Vancouver Art Gallery, Vancouver, Canada from March 9 until June 23 of 2002.

31. Here is the artist's intention of the work as expressed by a critic: "Douglas Gordon addresses the succinct and abrupt interval between living and dying... The experiment, which sought to find proof of consciousness after death, lasted between twenty-five and thirty seconds. Connecting the sensation of the beheaded body of the criminal to the sensation of the reader of the text, Gordon equates the interval between life and death with the time it takes a person to read the notes on the experiment" (Marcoci 6-7).

32. One of the radical theorists is Steven Holtzman. According to Bolter and Grusin, he argues that the new media will eventually develop out of the stage of remediation, and find their own authentic aesthetic.

33. The artist is my colleague at Simon Fraser University.

34. In accounting Benjamin's mimetic faculty, Michael Taussig explains that the optical unconscious in us is revealed by mimetic machinery like the camera and the movies (Taussig 15). These machines "would create a new sensorium involving a new subject-object relation and there for a new person" (17).

35. This is borrowed from Benjamin's idea of the mimetic faculty in children's play. He regrets this gift has decayed with historical development ("Mimetic Faculty" 333-334).

36. I borrow this term from Daniel Conrad's documentary film Accident by Design, 1998, distributed by the National Film Board of Canada.

37. Louis Pasteur, Lecture at University of Lille (December 7, 1854)

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