Art and Technology

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Before I venture into a discussion on how the notion of technology is when it finds itself within the context of art, let me firstly explain what I mean when using the word technology in the context of this following argument. I want to delineate it from Heidegger's 'essence of technology'[1] and refer specifically to what he called the anthropological definition of technology -'technology is a human activity.'[2]

The word has become so common now in both mainstream and cultural discourse that definitions seem almost superfluous. Its vast coverage of meaning and the common use of it extends not only to things and concepts but also to adjectives (or more precisely as noun adjuncts) which makes very evident the ubiquitousness of the thing that we think of as technology.

I put the word 'technology' into Google and then added the next letter of the alphabet, one after another. Google came up with: technology addiction, technology community, technology culture, technology districts, technology design, technology economy, technology exports, technology education, technology frontier, technology grants, technology investment, technology law, technology news, technology policy, technology practice, technology management, technology market, technology medicine, technology systems,

[1] Heidegger, Martin. The Question Concerning Technology, and other essays. 1977.
[2] Heidegger, Martin. The Question Concerning Technology, and other essays. 1977.

technology society, technology solution, technology societies, technology services, technology weapons, and technology wars.

Other than the fact that Google is brilliant, this only serves to demonstrate that the term 'technology' has become parlance for a vast conglomerate of ideas and things, so much so that it seems feasible to me that, as its presence in everything moves toward being a given, in the future maybe the word will drop out of use all together.

This meaning of technology that we are familiar with, is however, a marked metamorphosis from its original meaning. In Giorgio Agamben's book *The Man Without Content* the Italian philosopher analyzes the archaic meanings of technology and its relation to production/art. He explains that technology stems from the Greek word *τέχνη (tekhnē)* which simply put means 'art, or skill' and *logia* from latin indicating 'the science or study of'.

Agamben gives an account of how it was said by Sophocles that it is man who has *tékhnē* - alluding to the meaning of the word as not only art or skill, but also cunning or wile. However in the broad meaning the Greeks gave the term, it meant the ability to produce, to bring a thing from non-being into being.

Agamben's examination crosses to Aristotles *The Physics Book II* in which the ancient philosopher distinguished between that which does, and does not have *ἀρχή* (*Arche)* - a Greek word primarily meaning 'beginning, origin or source of action'. Of this second category of things, as Agamben explains, the Greeks said that *Arche* enters into presence

from *tékhnē* and that both the activity of the craftsman and that of the artist have the character of production into presence.[3]

Much of Agamben's critique actually draws upon Heidegger's essays concerning the relationship between art and technology. Heidegger stated in *The Question Concerning Technology* that 'In techne, through art and handcraft, and the arts of the mind, man participated in conjunction with other contributing elements, with matter, aspect, and circumscribing bounds - in the bringing forth of a thing into being'.[4] Here, to Heidegger's thinking, lies the real origin of the modern technological age. 'Techne was a skilled and thorough knowing that disclosed, that was, as such, a mode of bringing forth into presencing, a mode of revealing'.[5]

Technology as it is used in common parlance in contemporary society denotes a monumental wave of both objects and concepts, manifested and futuristic: the internet, the phones, the computers, nanotech, biotech, self-modification, augmented reality, virtual reality etc. and this wave has been a huge force in how art has developed, impacting even on the notion of what art is. Not only via the intellectual and creative friction it created within science and art, which could be said to be the two major cultural discourses, but also via that fact that it's presence exacerbated the infighting in the artworld itself between modernist and postmodernist discourse.

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[3] Agamben, Giorgio. The Man Without Content. Stanford University Press, 1999.

[4] Heidegger, Martin. The Question Concerning Technology, and other essays. 1977.

[5] Heidegger, Martin. The Question Concerning Technology, and other essays. 1977.

These debates in some form or other still rage today, whilst also permeating and incorporating philosophical debates that span from the humanist ideals of the enlightenment, to current discussions around posthumanism, transhumanism, bioethics, and cognitive science.

To many people the word technology just plainly means anything that has to do with computers, and in a very reductionist way this idea does have some merit. However to be precise, the computer is a technology, not technology as such. Nevertheless its particular story within the context of art brings to life a fundamental issue that was at the core of the evolution of art and technology.

Computer art could be seen as the preform to what is referred to today as digital or new media art. Like any other technology in the history of art, the computer took some time to be integrated into fine art, (if one could say that this has even ever occurred), and in fact the term computer art is rarely used in today's cultural discourse. By literal definition there is of course still computer art, as many artforms utilise all manner of computers embedded in all manner of devices, but by the late 1990s, the specific term was being used only as a historical pointer to denote the pioneering efforts of artists that used computers.

The computer as a medium defined by a physical machine and as a singular type of technology has been surpassed and absorbed into varied digital modalities across diverse social and geographical spaces. Therefore the fact that the term computer art was subsumed under the terms electronic/new media/digital art seems to be an innocent enough reflection of that evolution. Yet the reason for the abandonment of the term was maybe not as innocuous it

seems, as its falling by the wayside was not only due to the need to expand the definition beyond a singular type of technology, but was also due, if not mainly due, to a desperate need to leave behind the troubled past and sense of rejection associated with it.

The pairing of the words computer and art seems simple enough, but this coupling reveals the core of countless struggles within the science and art worlds. To many, particularly those in the art world, it was essentially a contradiction in terms. The computer in the 1950's and 1960's was most commonly found in the sphere of scientists, technologists, and engineers. Artists and the art world in general, had very limited understanding of the complexities of this new technology, so to most in art it was an incongruous and unknown element. The scientists, having never claimed to have any level of understanding of art and its methods, were happy to tinker with what they saw as the machine's abilities to make visual output, whilst the appearance of the computer in the sanctified realm of fine art was greeted with suspicion, if not explicit rejection. Therefore computer art was born across the large chasm that lay between these two major cultural discourses, and its ability to span this divide was almost impossible. In fact the resulting competing dogma between the two forces shaped and constructed the reception and criticism of computer art for decades, which in turn affected the history and evolution of art and technology in general.

Born into a cold war over cultural supremacy between art and science, computer art made clear the incompatibility and oppositional tendencies between the two worlds. Its presence antagonised both sides, however it had a particularly sting for the traditionalists in both camps. When one looks at how the art world scathingly rejected and derided the form, refusing it permission into the holy grounds of fine art for decades, it is quite evident that it

was the art traditionalists that were most incensed by the computers intrusion. Specifically it was the dominant humanist tradition within the art world that fueled the significant anti-computer reaction. From the outset, the strong anthropomorphic ideals of Renaissance humanism came down hard on computer art as a movement, and the artists working within the field where chastised for being dehumanizing and hyper-rationalist. This type of anti-computer dogmatism, that one could say was really more emotive than critical, persisted for more than twenty years. In fact in 1989, which we could say was a lot more than 20 years since computer arts inception, an exhibition was held at the prestigious SIGGRAPH conference titled *Computer Art - An Oxymoron?* I think this effectively demonstrates the sentiment that still pervaded from the inception of the term in 1963, right up to its decline in the early 1990's.

The fact of the matter is that to understand art and technology (including computer art of that time), and subsequently to be in the position to be able to adequately criticise it, requires an extensive knowledge from, and sensitivity to, both sides of the cultural fence. It requires an understanding of scientific theories and themes - themes such as artificial intelligence and artificial life, cybernetics, information theory, and the science of complexity (to name a few). Whilst it also requires an understanding of art theory and the theories that evolved and where relevant through the modernist to postmodernist periods, and to have knowledge of, and see the relationship between, art and technology and the art movements of that time.

It seems to me that one of the most obvious areas where science can be literally seen in art and technology is the area of artificial life. Viewing digital technology as a direct analogy to biology is the basis for the study of artificial life, and it was for this reason that the field of

study became of interest to biologists as they could see it was a way to learn about life itself without having recourse to dissect and take apart things which are already living. AL strives to build life itself from the ground-up. The major advantage of looking at life from this perspective is that by recreating life in a different medium, we are not limited to our own system. On Earth we only have access to carbon-based life, so when we examine the organisms of our planet, we can discover the things which define life on our planet but not universal life in general. Chris G. Langton, one of the founders of the field of artificial life states in his book *Artificial Life* - 'In addition to providing new ways to study the biological phenomena associated with life here on Earth, life-as-we-know-it, Artificial Life allows us to extend our studies to the larger domain of 'bio-logic' of possible life, life-as-it-could-be…'[6]

This synthetic rather than reductive approach towards biology can also be seen in its analog in chemistry, the field of study known as synthetic chemistry. Synthetic chemistry is the ability to create and put together chemical compounds which are not found in nature, which gives us the ability to better understand the theory of chemical phenomena, and to create new materials and chemicals.

This notion of artificial life is analogous with the generative and emergent discourses seen in the fields of early computer art and still today in some areas of art and technology. The biological metaphor was in fact implicit in the work of the computer artists of the 1970s, while by the 1980s, with fractal and genetic algorithms, the metaphor became fully active. In the last years of the decade of the 80's the purity of the algorithmic process was increasingly associated with generative art systems. In the wake of computer art's decline, the notions of

[6] Langton, Christopher G. Artificial Life. Redwood City, CA: Addison-Wesley Publishing Company. 1989.

generativity and emergence became crucial to the more specific forms of art that began to develop such as generative art and algorithmic art. Although there was postmodern opposition to the idea of generative art, its position was secured by the growing influence of artificial life and the more general cultural fascination with the possibilities promised by biotechnologies.

In art in 1989, there was a distinctive shift toward contemporary art and its dominant critical discourse - postmodernism. Computer art in a continued attempt to gain critical acceptance quickly followed critical discourse trends, and began theorizing technology through postmodern critical modes, specifically toward the social-critical.

For the postmodernists, the only important aspect of the computer was that it disrupted the agenda of modernism, and it was increasingly represented as liberating, democratic, and open, rather than rational, reductive, and centralized. The computer became perceived as a technology of rupture rather than an embodiment of the Enlightenment vision, and accordingly the cultural understanding of the computer changed via the postmodern vision. This can be seen specifically in computer art, where the way an artist engaged with the computer became reflective of his central worldview, he was either a modernist or postmodernist depending on whether he identified as an artist user (one that used commercially available software) or an artist-programmer.

Nevertheless, this reorientation toward contemporary art and its dominant critical discourse meant that the thinking of Walter Benjamin, Michel Foucault, Jacques Derrida, Roland Barthes, Jean Baudrillard, and Jean-Francois Lyotard began to be discussed in relation to art

and technology, and there were inherent contradictions in employing the intellectuals and theorists of postmodernism to emphasize the importance of new forms of technological art like the computer. From its very beginnings, postmodernism embodied a strong current of technological pessimism. In fact, the representation of technology as a power not to be trusted inhabits the work of Foucault, Derrida, Barthes, Baudrillard and Lyotard in that time period.

In the specific area of postmodernist art discourse, the emphasis was on content rather than its mode of production. Postmodernist practice was, as Rosalind Krauss suggested in her book *Sculpture in the Expanded Field* - 'not defined in relation to a given medium … but rather in relation to the logical operations in a set of cultural terms.'[7] As the postmodernist rejected any medium-based purism and insisted on technological transparency, the argument regarding medium specificity became particularly heated in discussions surrounding the computer. Fortunately the term *digital art* came to the aid by suggesting an overall process without linking the hardware itself directly to the art, and the terms electronic art and new media art also broadened the definition and placed emphasis on process rather than machine.

Margot Lovejoy, an artist and critic, was a significant figure in specifically applying postmodern theory to art and technology discourse. In 1989, she published the influential *Postmodern Currents: Art and Artists in the Age of Electronic Media*, which positioned art and technology as part of the larger cultural postmodernist trend. For Lovejoy, electronic technologies were emblematic of the postmodern era. She believed that technological change transformed consciousness, disrupted modernist conventions, and forced a redefinition of representation and its evaluative criteria.

[7] Krauss, Rosalind. Sculpture in the expanded field. *October* 8 (1979): 31-44.

Technology in general did become increasingly understood through these cultural paradigms and discourses, nevertheless, it was clear that postmodernism did not take over as the dominant paradigm from which art and technology could be understood. That said the influence of postmodernism and critical theory in general, provided a theoretical foundation for digital art and new media in the 1990s.

Even in this very brief look at the theories that evolved and were relevant to art and technology as it was born into the transition between modernism and postmodernism, a strong undercurrent of humanism can be seen. As much as the aim of the social/critical thinkers of the time was to undermine the notions of modernism so as to present a more relevant and progressive argument, to me presenting technology as a potential threat to humanity's existence demonstrates that these postmodernist thinkers still had strong humanist ties to modernist themes. Whilst the notion of medium specificity, or its anti version in the postmodernist form, was, it could be said, a criticism that was always more a reflection on the medium than on the art.

From my standpoint, the fact is that art and technology is about the medium. Of course it is about technology, how can it not be? But, it also isn't only that. It is still considered in some camps that medium specificity, both as a way to describe artistic practices and as a way to analyze artwork, is a modernist trope. However I am squarely in Christiane Paul's camp when she states in *New Media in the White Cube and Beyond* that 'no object or art form can be separated from its own materiality (or virtuality even), and one could argue that every

painting also is *about* painting and comments on its own medium - although self-reflexivity substantially varies from one work to another'.

The point for me is that art and technology is about the technology through which it is created, however, as I stated at the beginning of this paper, the term 'technology' has become parlance for such a vast conglomerate of ideas and things, that it seems feasible to me that as its presence in everything moves toward being a given, in the future the word could drop out of use all together. And so art and technology would be simply be art again. Which subsequently would require it to be defined and critiqued through other more, or less relevant lenses.

If I was to truly adhere to a postmodernist thought, (which, being a stalwart eclectic, I would never do) I would side with Jean-François Lyotards definition in his seminal work *The Postmodern Condition*. He suggested that 'Postmodernism refines our sensitivity to differences' and increases 'our tolerance of incommensurability'.[8] So if we take his thoughts to have some merit, mustn't we therefore include, or at least consider modernist theories in the context of postmodernism? - or even now?

One would have to concede that digital art/new media art is about technology now, but this needs to be taken in its contemporary context. As Paul describes it 'technology is a medium, like paint or clay, for most new media artists. Having worked with it for a decade, if not several decades, they take it for granted. This is not to say that these artists are uninterested in

[8] Jean-François Lyotard, The Postmodern Condition: A Report on Knowledge (Minneapolis: University of Minnesota Press, 1984), xxv

or do not closely follow the 'latest' technologies. Because the medium often lags behind the concepts that artists try to communicate, they must often push the boundaries or develop technologies to express their ideas'[9]. It is only if the spectator is unfamiliar with technology that it becomes the focus of attention, whether this is the intention of the the artist or not. For the knowledgeable audience, in contrast, 'the technology is transparent and thus moves to the background and becomes mostly a vehicle for content'.[10]

Paul makes the pertinent point that 'Art audiences and museum visitors have looked at paintings for centuries, so the medium of paint is neither a surprise nor an obstacle...the way we have been 'trained' to assimilate certain art forms, such as painting, have not necessarily provided us with a vocabulary to understand other forms, such as new media'. [11]

Maybe art and technology has not been around for long enough for the technological aspect to be a vehicle for content, however when we look art and technology in its infancy and the relationship between it and the art movements of that time, specifically conceptual art, there are obvious correlations between the two.

When Marshall McLuhan declared that electronic media were creating an increasingly interconnected global village in 1962, it popularized the idea that the era of machine-age technology was over and that we were rapidly moving into the new era of information

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[9] Paul, Christiane. "New Media in the White Cube and Beyond: Curatorial models for digital art." *Leonardo Reviews Quarterly 1.01| 2010* (2008): 33.

[10] Paul, Christiane. "New Media in the White Cube and Beyond: Curatorial models for digital art." *Leonardo Reviews Quarterly 1.01| 2010* (2008): 33.

[11] Paul, Christiane. "New Media in the White Cube and Beyond: Curatorial models for digital art." *Leonardo Reviews Quarterly 1.01| 2010* (2008): 33.

technology. Hype or not there was an increasingly dematerialized forms of experimental art appearing alongside this prophecy, which in the area of art and technology was revealed in the progression from the materiality of technological apparatuses and their products, to the artistic use of information technologies (such as computers and telecommunications) and the ephemeral programs and protocols of computer software.

Conceptual art was also emerging during this moment of intensive artistic experimentation with technology, and even though it could also be seen as a form of dematerialisation that echoed the larger social transformations from the machine age of industrial society to the so-called information age of post-industrial society, the literature of art history has only ever drawn a strict line between conceptual art and art and technology.

However Grant D. Taylor states in his book of 2014 *When the Machine Made Art,* that 'of all the art movements of the 1960s, conceptual art is the one most aligned with computer art'. Furthermore, in *Art of the Electronic Age*,[12] Frank Popper places one of the origins of computer art in the rise of conceptual art, and he cites Christine Tamblyn's article *Computer Art as conceptual art*,[13] which argued that because 'computers were designed to augment mental process, as opposed to being visual or manual aids,' they were more suited to mental conceptualization.

Like conceptual art in Europe and America, computer art appealed to the same concepts of objectivity and the will to detach the art object from the idea. Seriality for example, relied on

[12] Popper, Frank. Art of the Electronic Age. London: Thames and Hudson, 1993.

[13] Tamblyn, Christine. Computer art as conceptual art. *Art Journal* 49.3 (1990): 253-256.

the application of organizational schemes or systems that engender a number of possible visual sequences. Similarly, systems and algorithmic procedures, along with the production of different visual sequences, provided the basis for some computer-generated artworks.

Timothy Binkley, writing in the 1989 issues of both Leonardo and Art Journal, believed that computer art was decidedly postmodernist in character because of its conceptual orientation. Binkley saw computer art as part of the trend toward the dematerialization of the art object, and the inherent abstraction and symbolic mode of computing meant that the art sat easily in the sphere of conceptualism.[14]

Edward A. Shanken is an art historian whose research examines the art-science collaboration. In his essay *Art in the Information Age: Technology and Conceptual Art,* he draws some interesting parallels between these practices. He defines conceptual art as a meta-critical and self-reflexive art process - 'in interrogating the relationship between ideas and art, it de-emphasizes the value traditionally accorded to the materiality of art objects. It focuses...on examining the preconditions for how meaning emerges in art.'[15] Shanken then points to a corresponding meta-critical processes -'art and technology investigations include the use of both scientific concepts and technological media to question their prescribed applications and to create new aesthetic models'.[16] He points out that this is a meta-critical process as 'it challenges the systems of knowledge that structure scientific methods and conventional

[14] Binkley, Timothy, Refiguring Culture in Future Visions: New Technologies of the Screen 1993 Binkley, Timothy, Transparent Technology: The Swan Song of Electronics," Leonardo 28, no. 5 1995: 427–432.

[15] Shanken, Edward A. Art in the Information Age: Technology and Conceptual Art. *Leonardo* 35.4 2002: 433-438.

[16] Shanken, Edward A. Historicizing Art and Technology: forging a method and firing a canon. na, 2007.

aesthetic values… [and] it examines the social and aesthetic implications of technological media that define, package and distribute information'.[17]

Shanken feels that a more comprehensive account of art since the mid-20th century could be formulated - 'such a history will acknowledge cybernetics, information theory and systems theory as foundational intellectual models that, in combination with the advent of digital computing and telecommunications, played a significant role in shaping culture.'[18]

It seems obvious to me that art and technology has an important role in the still ongoing process of merging and reforming previously uncrossable barriers between the logical philosophies of science and the intuitive powers of art, and possibly to bring the notion of the essence of technology into being within contemporary art. By aiming to cultivate understanding outside art discourse, and continuing to see the potential value to be derived from gaining knowledges across the wider boundaries and tendencies between science and art, this can only assist in informing and developing the role that art has in shaping culture. Which being an artist, I would say was a good thing.

[17] Shanken, Edward A. Historicizing Art and Technology: forging a method and firing a canon. na, 2007.

[18] Shanken, Edward A. Art and Electronic Media. 2009.