Truth, Beauty, Freedom, and Money

Technology-based Art and the Dynamics of Sustainability

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a report for *Leonardo Journal*
supported by the Rockefeller Foundation

Participant's Draft
24 April 2003
Not for Distribution

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Abstract

Technology-based art has become increasingly of interest to both the art and the technology communities, as well as to the public at large. It has been adopted by art centers interested in technology and by research labs interested in art, places with different cultures and histories.

New support opportunities exist for tech-based art, such as commercializing invention and tapping a new generation of collectors, patrons and sponsors. But tech-based art is still art, which suffers from deep cultural inadequacies in the US. Based on travel and discussion both inside and outside the US, observations about the art and technology landscape and opportunities for future support are presented. Details for an “Arts Lab,” a unique hybrid art center and research lab, are specified.

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Acknowledgements

I am grateful for the opportunity to do some things I haven't done before. Like quietly working with talented young interns compiling a database from the bottom up and watching structure emerge, with little interference on my part. Like taking advantage of cheap airfares and visiting eight European countries and making four West Coast trips, three East Coast trips, and a trip to Banff, mostly during a two month period, carrying only a pad and pen as tools. Like closing my door for a month and doing little except writing. I am grateful for this opportunity to spend some time "going meta" and think about the big picture.

I wish to thank Joan Shigekawa from the Rockefeller Foundation for the opportunity. During this moment of economic strain, I am particularly grateful for her leap of faith, as well as for her candid comments.

I also thank Roger Malina and the Leonardo/ISAST board and staff for supporting this project and for their highly informed insights.

Red Burns, NYU Interactive Telecommunication Program Chair, entrusted me with an office and access to ITP interns during the early stages of this project. The interns, Mark Argo, Defne Ayas, Elizabeth Goodman, Ann Poochareon, along with ITP alums Yury Gitman and Katherine Moriwaki in Dublin, hit the Web (and the street) looking for anything relevant to our understanding. From this wonderfully eclectic pile of data, patterns emerged which became the basis of a web site they produced, my most valuable resource. I only hope that Red and the ITP helpers received as much as I in return.

I am deeply grateful to the several dozen seasoned experts who gave me their time, attention, and hospitality while addressing my naïve questions and awkward scribbling. Though these visits may have sometimes appeared to be of questionable value, their value was enormous, as pieces of the big picture gradually fit together.

I thank Betsy Seder for her inestimable production help shaping and editing, and with her talented design skills.

And I wish to lovingly thank Marie Sester, my wife and my most challenging provocateur.

From all your help comes something unpolished but hopefully fresh, something uneven but hopefully representative, something subjective but hopefully provocative. And hopefully, something hopeful.

Prologue - What Happened?

We are in an inflection point.
- John Seely Brown, Former Director, Xerox PARC, Palo Alto

Not that long ago, it seems, a dream shared by many was on the verge of fulfillment. The dream is about connecting the world, connecting everyone to the world's information and to each other. The dream would encourage cottage industries to flourish, would level the playing field for the disadvantaged, and would empower everyone with tools for their own expression and exploration. The dream has driven the passions of artists wishing to explore new forms and researchers interested in inventing them. Truth and beauty, and freedom, hallmark provinces of Modernity, would be revised to be relative, cultural, and personal rather than objective, centrist, and absolute, and they would be for all who wish to pursue, create, and challenge them.

The dream has been around for several decades, anchored in the development of computer and communication technologies. In the mid-1940s, the digital revolution began with the mathematical invention of the "binary digit," the bit, by Claude Shannon and Warren Weaver, and of "feedback" and "cybernetics" by Norbert Wiener. Also during this period, MIT hired its first artist, Gyorgy Kepes, with his vision of "The New Landscape." In the 1950s it was Arthur C. Clark and the concept of satellites, and Margaret Mead and Gregory Bateson applying cybernetic theory to society. In the 1960s it was Buckminster Fuller and his idea of "Spaceship Earth" and Marshal McLuhan and the "Global Village." In the 1970s, Stewart Brand and the "Whole Earth" movement, and Gene Youngblood and the "Information Utility." The electronics, computer, and communications revolution that began after World War Two continued to accelerate.

Art paralleled. Movements such as independent filmmaking, kinetic art, Experiments in Art and Technology (EAT), and video art were all shaping the technology as much as the technology was shaping culture.

Then something happened to the arts in the US in the 1980s, two things actually. First, US government social spending dwindled. The US arts community became increasingly politicized and to some extent, angry, in part because of the urgency of unaddressed social issues such as economic inequity, the homeless, and AIDS. Second, the 1980s witnessed a dramatic increase in attention to packaging. Advertising budgets skyrocketed to the point of matching or exceeding actual product costs. Not-for-profit institutions became increasingly dominated by professional marketers convinced that "being more business-like" meant more packaging. The stress was so extreme that at San Francisco's venerable Exploratorium, known for its collective work environment, the workers unionized. Meanwhile, the electronics, computer, and communications revolution continued, and by the end of the 1980s, the cultural gap between high-tech entrepreneurs and the not-for-profit creative community had widened.

In the 1990s computers became affordable for the home and a global network infrastructure became accessible. A gold rush began. Silicon Valley became a white-hot glow on the world money map. A new generation that grew up with email, the Worldwide Web, and Wired Magazine simultaneously produced entrepreneurs with startup fever and artists/activists proactively engaged in a global community. The lines between commerce and creativity had blurred, and to many of us, this was good news.

The bubble burst in 2000. Nearly everyone today seems to have the same comments. First, what were we thinking? Billions of venture capital flooding into such new, untested concepts. A home-run-or-nothing risk mentality. And such youngsters! By 2001, downtown San Francisco commercial vacancy rate shot from near zero to 40%, and U-Haul had a three-month wait for one-way rentals out of town.

But also, the world had become wired. Those lucky to be born in the right family, or on the right continent, now had instant, high-speed access to a global database and to each other. We've reached critical mass and there's no turning back. We can assume that for the rest of the world it's only a matter of time, albeit critical time. New forms of creative expression and exploration are possible and inevitable. Expect some really beautiful, really stimulating, really weird new stuff.

So here we are. The technology-based revolution has arrived. It's affecting all aspects of everyday life and it's unstoppable. But everything has changed practically overnight. We have a very clear idea what doesn't work, but not much of a clue for what does.

We are in an inflection point.

Technology-Based Art

A great deal of discourse has been generated about art and technology and their relevance to culture and society today. Here are some personal comments and observations.

Riding a Wave

"New Art" is always about what's hot now. It's like a wave, always moving. Riding the wave means never committing to any movement, medium, or technology. One might call New Art "first word" art, as opposed to "last word" art. [1] It's about working in uncharted territory, where rules and conventions have yet to be established, and judging is difficult to calibrate. Conventional critics hate it, since they can't sink their teeth into anything with which to compare. Curators are caught in a dilemma, since one role of the museum is to build a collection of artifacts worthy of preservation in perpetuity, while another role is to present the fashion of the times.

Consider, for example, 16mm filmmaking in the 1960s. It was where the action was for anyone exploring moving images. Today, 16mm film is considered as romantic a medium as paint and canvas. The explorers rode the wave to the emerging medium of video in the 1970s. Video art has now become an accepted genre, and like film, artists working in video today are more concerned with using the medium rather than exploring it.

It's noteworthy that to some, "true art" can only happen in stable media, while to others, it's the opposite. Some artists have no interest in riding the wave and prefer to work in stable media, where they can concentrate quietly on what they wish to express. For other artists, once anything new and uncharted becomes decoded and codified, it's time to move on. Stewart Brand once observed: "Creating in new media always has […] deeper possibility. You might be creating a medium itself. You might be creating creating." [2]

Much of the New Art today is directly or indirectly technology-based and has taken several titles, all of which have slightly different connotations and histories. Computer Art or Digital Art stresses the use of processing in the work. Media Art and New Media Art ranges from a MacLuhan-esque view that the medium affects the message, to an explicit interest in new media technologies. Art and Technology, Tech Art, or Techno-Art, is about the potential symbiosis between these two fields. Electronic Art may sound more general, but is most associated with Ars Electronica in Linz, Austria, the largest competition and festival of its kind. Cyber-Art became a fashionable term as cyber-anything became fashionable, almost always referring to the term Cyberspace from William Gibson's 1984 novel Neuromancer (rather than its actual root, Cybernetics, coined by Norbert Wiener). Art and Science, or Science Art, is the oldest and least timely of these terms, harkening back to the world before the western Industrial Revolution, when they were perceived inseparable.

Splitting hairs on whatever differences may exist between these terms misses the big picture. Regardless of what it's called, all of the new tech-based art has much in common, differing significantly from traditional and "old" New Art. It is electronic and computer-based, and the Internet is either explicitly or implicitly involved (no tech-based artist doesn't have email and Web access). Words most often associated with the new tech-based art are fast, cheap, unpredictable, incomplete, and unstable. The old rules and conventions, by definition, don't apply.

The last generation of tech-based art required expensive equipment. Being a tech-based artist was often about gaining access to big computers, bright projectors, and specialized hardware. Those days are over. The

power of a Silicon Graphics Reality Engine computer, the most powerful graphics computer just ten years ago, lives today in consumer toys like the Sony PlayStation Two. Video projectors as big as refrigerators are now small enough to fit in briefcases. The cost of computer memory is cheap enough that audio and video tapes (not to mention film) are on the road to extinction.

This sudden cheapness, and access, to the tools for tech-based art grounds it in a sense of community and everyday life. “Local” has taken on an entirely new meaning in the context of the Internet, where “local communities” now mean any group with anything in common and email access. There is the sense that these tools are affecting all of us, not just the elite few.

Because of the ubiquitousness of the technology, tech-based art has a particularly strong connection with the activist community. The tools of tech-based art are increasingly used by everyone, not just specialized craft people. The computer, the Internet, and the camcorder connect to everyday life in ways that the paintbrush, the chisel, and clay never did. They are “tools of the people,” with a high potential to be enabling mechanisms for political actions.

Of course, not every artist working with these new tools would agree (thankfully), but anyone scanning the Web for tech-based artwork will find its connection with activism strong, for example, Rhizome.org, the premiere new media arts forum, which receives 10 million hits per month.

Nevertheless, it’s important to point out that from the perspective of the art world, tech-based art is only a minor part. Museum curators, gallery owners, collectors, and critics spend most of their time and resources on conventional art. Given how long it took photography to be accepted by the art world (almost a hundred years), and how long it took video and installation art to be accepted (ten to twenty years, depending on who’s counting), this is no surprise. If anything, today’s tech-based art, such as “Web Art” or “Database Art,” is being accepted as viable media for art faster than its precursors.

An artist today making Database Art may continue to make Database Art, and after many years, perhaps the artist will become virtuoso in Database Art. But the wave will move on, and tomorrow’s New Art will be different from today’s New Art. That’s its nature. But tomorrow’s New Art will almost certainly also be tech-based.

The (Rich) Gold Matrix

Rich Gold died in his sleep at the age of 52 this past January. Among his many contributions to the understanding of the New Art was a simple little two-by-two matrix that he enjoyed drawing. In this matrix Rich would write the words ART and SCIENCE left and right at the top (arbitrarily, we would assume), and DESIGN and ENGINEERING left and right at the bottom. The point he was making is that art and science share something in common, as do science and engineering, and that art and design share something else in common, as do science and engineering.

This modest little matrix has proven immensely valuable in a variety of ways. As Rich was fond of pointing out, art and science account to patrons and peers, while design and engineering account to clients and users. He also noted that during the last great heyday of art and technology, the period in the late 1960s/early 1970s, for example the EAT movement, most of the collaborations were between artists and engineers, the “diagonals.”

An amusing exercise was to name the axes of the Gold Matrix. One particularly provocative example was to name the art/science axis “esoteric” and the design/engineering axis “applied,” then name the art/design axis “beauty” and the science/engineering axis “truth.”

The most fundamental contribution of the Gold matrix was simply acknowledging the difference between these fields, or as Rich preferred to call them “hats” (since we can all wear more than one). Simply put: art, science, design, and engineering are different, even though they all may have connections to technology. “Our job is to create language to speak to each other with respect,” Rich said.

The Business Connection

Nolan Bushnell, the video game pioneer and founder of Atari Corporation, was credited as claiming that “the difference between Communism and Capitalism is trade shows.” I once asked Nolan what he meant by this. He explained that when a new business is getting ready for a trade show, 90% of the work happens in the final 10% of time. And that the deadline is absolute: one must work hard, keep their wits, be resourceful, and be ready in time, no matter what the financial, social, or personal cost. This is how things get done in tech-based business, he said.

This is also how things get done in tech-based art. At tech-based art exhibitions such as Ars Electronica and ISEA, artists often work through the nights before the opening, and their often-untested projects are completed just in time. At Siggraph, with its trade show and art exhibition side-by-side, the scurrying and scrambling of the participants is often identical.

Today’s tech-based art has several connections with business that are unique and different from the old New Art. For one thing, the old New Art was heavily informed by the 1960s and the left-wing political movement, which was largely anti-large-corporation and anti-business. The anti-corporation sentiments may or may not have diminished (e.g., Apple and Ben & Jerry’s compared to Microsoft and MacDonalds), but the anti business sentiments certainly have.

Many young people involved in the new tech-based art want to be more business-like. This can be seen in the newest generation of Web art collectives such as the Trinity Session in Johannesburg and Torolab in Tijuana. To them, being more business-like is simply common sense. Also, many young people today had business experience in the dot-com era of start-ups.

In addition and distinctively different from being business-like to earn money, many tech-based artists see the marketplace as an arena for social and cultural change. To them, the fine arts community is simply too elitist. Some see the design community as being just as creative but more effective for change by engaging mass culture through the marketplace. “When it comes to affecting pop culture, art is rarified while design is muscular,” exclaims Brenda Laurel. “Art is exalted and design is just the stuff you buy,” agrees JC Herz. Others, like the anonymous group RTMArk, are less commercial and more radical, engaging in business-like practices as an efficient means for cultural change.

The Education Connection

A decade ago, explaining art was mostly considered uncool. Didacticism in the arts was left for the scholars, critics, and historians. I was guilty of this myself, writing that the difference between teachers and artists was that teachers strove for “impact through clarity” while artists shot for “clarity through impact.” [3]

One reason for the polarization was that much of the first-wave educational technology was based on passive rote-style learning. “Educational Multimedia” meant flowcharts and multiple-choice programs, about memorizing rather than provoking and stimulating the mind.

Something has changed since then, and more connections exist now between the tech-based arts community and the livelier segments of the education community, particularly with the Constructionist community. Constructionism was coined by Seymour Papert, co-founder (with Marvin Minsky) of MIT's Artificial Intelligence Laboratory and inventor of the famous LEGO programming language for children. It simply means that true learning takes place when we are actively engaged in constructing rather than passively consuming information. Constructionism emerged from the theories of Swiss developmental psychologist Jean Piaget, active from the 1920s until his death in 1980. (Constructivism, the influential art movement that migrated from Russia to Europe in the 1920s, is different from Constructionism, though not unconnectable, especially since Piaget used both terms.) The Constructionist community has embraced new technologies, as they have become cheap and ubiquitous. For example, the Boston Computer Museum and the MIT Media Lab established a "Computer Clubhouse" based on Constructionist principles in 1993. Today there are over 75 Computer Clubhouses around the world.

For artists working with the new technologies, Constructionism is interesting. It has many of the same properties as the new tech-based art: embracing cheap technology, making things quickly, and being exploratory by nature. And a common interest exists in exploring emergent systems, where rules are established but not the outcomes. Understanding emergence develops insights into such complex systems as ecology, the Internet, and human cognition. Children learning with Logo and artists hacking on the Web share this fascination. It's unstable, surprising, and fun. Intellectually, it puts Cybernetics back into Cyber-Art.

Constructionism and emergence also connect science and art emotionally. Says Viewpoints Research Institute founder Alan Kay, "Science is like art. It's like the thing that wakes you up and shows you a different perspective on important things." [4]

The Research Connection

Several years ago, as a Member of the Research Staff at Interval Research, with a business card which read "arts and media projects," I noted six reasons why art projects in a research lab have significant value to the research lab [5]:

1) art projects provide stimulation and provocation to our research community, adding meaning, entertainment, and emotional resonance to our work;

2) these projects often act as magnets to bring together unconventional combinations of skills and talents;

3) they can provide content to test tools (and even tools to test content);

4) some of these projects are means for collecting data about human behavior, both through explicit query as well as through observation;

5) these projects may lead researchers down unforeseen paths and result in new discoveries and intellectual property;

6) external deadlines and public scrutiny serve as forcing functions for decision making, rigor, and completion. They keep us street-smart. "Putting on a show" is a test bed for new ideas, a simulation of the real world.

If one swaps the words "art" and "research," the same reasons are valid for why tech-based research has value in arts centers.

Another connection has brought together tech-based art and research: the demo. Traditionally, artists make exhibits and researchers write papers. But much of the new tech-based art today is incomplete, unstable and temporary, while much of research, particularly if it's media-related, must be experienced as much as described. Hence both tech-based art and research have converged around the idea of the demo.

The convergence comes from opposite poles. In research labs, demos "make real" something otherwise left to words alone. Demos have become the currency for success (as well as for funding) at places like the MIT Media Lab. In the arts, a demo is proof of concept, which for many tech-based artists, is enough. This convergence toward the demo helps to blur the line between artist and researcher.

Exemplars Of Support

Tech-based art is largely supported by two different kinds of institutions: art centers with an interest in new technology and research labs with an interest in art. Some are university based. Some are corporate based. Some are government funded. And because of the ubiquitousness of the technology, many tech-based artists are happy to exist entirely outside of any institutional environment. Here is a survey of my exemplars, including ones from different but relevant fields.

MIT Media Labs and CAVS - Justifying art

The MIT Media Lab has become the archetype by which all research labs with an art presence are compared. The reputation, though earned, didn't always exist.

In 1980, plans were underway for the Media Lab under its original name, the Arts and Media Technology Facility, with the goal of putting under one roof all of the relevant MIT programs, including the Center for Advanced Visual Studies (CAVS). The CAVS was MIT's art program, founded by Gyorgy Kepes in 1972. During the planning process, the CAVS community abruptly pulled out and wished to maintain its own independence. The facility's name was changed to the Media Lab (and the old name resurfaced in Karlsruhe, not by coincidence).

The result fractured the arts community at MIT and was particularly significant because it was microcosmic of what was occurring everywhere else in the US. On the one side of campus was a sparkling new, corporate-funded building full of interesting technological activity. On the other side of campus was a smaller, poorly funded group of students and Fellows determined to make art. The situation persisted well into the 1990s and is still emblematic of differences in values today.

Art has increasingly been adopted at the Media Lab for several reasons. For one thing, faculty and students were submitting their work, both art and research, to well-known art venues such as Ars Electronica and the Siggraph Artshow, where they gained visibility. Another reason is simply that the new tech-based art has become itself more visible, and accepted, to both to the general public and to the Media Lab's sponsors. Perhaps most importantly, everyone involved is better at articulating and justifying why art at a place like the Media Lab has value.

For example, Sociable Media Program Director Judith Donath connects art to problem solving: "If you look at everything as problem solving, then art and design are on a continuum and distinguished by what the problem is. If you don't, then art and design are completely different."

Media Lab co-founder Nicholas Negroponte masterfully connects creative, unfettered research to problem-solving value for corporate sponsors. He often tells a story to potential sponsors about how magicians developing a Las Vegas show act impacted a Japanese corporation in need of help with their baby seats for cars. The magicians were building a giant, instrumented chair with several Media Lab faculty and students - it was creative, open-ended, and fun. One day, several sponsors from a large Japanese corporation were visiting the Lab and saw the chair. "This answers our question," one of them said. Their corporation was a major manufacturer of baby chairs for automobiles, and they were facing the new problem of airbags being tragically dangerous for babies oriented in a particular direction. By seeing the magicians' chair, they realized that they could use inexpensive sensors in the baby chairs to determine the orientation of the baby, which

could solve their problem. The point, Nicholas continues, is that the Media Lab would never work on an external project such as improving baby chairs, and the Japanese corporation would never fund magicians building a Las Vegas act.

The Media Lab's new satellite labs in other countries, such as the Media Lab Europe in Dublin, and the Media Lab Asia in various cities in India, are largely government funded. While corporate sponsors may require explicit justification for art making with their support, governments do not, since part of the government's responsibility is to support culture and the arts.

Similarly, a new generation of patrons interested in tech-based art is emerging that didn't exist several years earlier. If more arts patrons fund the Media Lab, more arts activity will result.

A new initiative has begun at the Media Lab to build a "Center for Art and Invention," particularly noteworthy because of its integration of the learning and education community there. As summarized by Mitch Resnick, Director of the Media Lab's Learning Group: "We are creating and designing for creating and designing."

Meanwhile, the CAVS is still alive at MIT, but with an ambiguous existence and an unresolved fate.

Xerox PARC, Interval Research, and Intel - Art for knowledge, art for visibility

In the 1990s, Xerox PARC and Interval Research Corporation, long-term research labs a stone's throw from each other in Palo Alto, both supported small but lively arts programs. Both programs ended by the end of the decade as PARC morphed and Interval closed, and the niche for such support is currently filled by Intel Corporation, almost exclusively. In all cases, the justification was based largely on the value of art in research and the value of art for public visibility.

The PARC-in-the-70s story is now legend: virtually all of the elements for the Macintosh computer and for Microsoft Windows were invented there during the 1970s, but Xerox, the black and white paper copying company, fumbled by not appreciating its value. It was successful in assembling a creative and diverse research community but unsuccessful in protecting or marketing its intellectual property.

Interval was founded, with a $100 million investment from Paul Allen, on principles similar to PARC of the 1970s, such as building a creative and diverse research community, but with a commitment to identify, protect, and market its IP. With an adopted motto by Interval researcher Pierre Saint Hilaire, "We have to do it while it still seems crazy" [6], a small but significant art presence was considered important from the beginning. David Liddle, Interval's Founding Director, was fond of referring to Interval artists as "free-range artists," seamlessly mixing with the rest of the research community. Interval also supported arts-related academic programs such as NYU's Interactive Telecommunications Program (ITP) and the Royal College of Art's Computer-Related Design (CRD) Department, which provided periodic workshops and summer interns. Several patents resulted from the arts activity.

During the same period, Rich Gold initiated a PARC Artist-In-Residence (PAIR) program. Outside artists were paired with researchers, under the assumption that both parties would do their work but that a valuable symbiosis would occur. Unlike at Interval, where the artists were employed and usually engaged in other activity, PARC artists remained independent and received stipends. And while PARC artists owned the work they produced, Interval owned everything produced by Interval artists. Both labs both published and patented, and Interval developed a legendary reputation for being over-secretive.

Both programs gradually disappeared during the late 1990s. At PARC, the results were published in a book entitled Art and Innovation by MIT Press. Many of the young arts-related researchers who accumulated there during this time continued arts-related work under the Research in Experimental Documents (RED) group, making novel exhibits about the history and future of reading. At Interval, the decline occurred as attention redirected toward, and as pressure mounted for, successful spin-off ventures. Curiously, the only group exhibition of Interval's art projects took place in the inaugural show of San Jose's Tech Museum of Innovation, directly followed by the first group exhibition of PARC's RED Group.

Today, Intel Corporation is the largest American corporate supporter of tech-based art, though exclusively focussing its funding on universities. Intel's art champion, Dana Plautz, justifies Intel's return on its art investment in terms of the high public visibility it affords, and of the engagement artists can create within Intel's internal research community. Intel owns nothing and everything is made public, indeed, anything demonstrating creative use of more processing power is good for Intel.

"The current economic slump is bad timing," Dana acknowledges, "since similar programs were beginning to take hold in other high-tech corporations. It's only a matter of time."

Ars Future Lab and Interactive Institute - The seamlessness of art and industry in Europe

The Interactive Institute in Sweden and the Ars Electronica FutureLab in Austria are seemingly opposite organizations, but in fact are very similar. They are both uniquely European. Neither could exist in the US today.

FutureLab was formed in 1996 as an R&D spin-off of the Ars Electronica Festival in Linz, initially to fabricate the commissioned artworks for the Festival and for the Ars Electronica Centre, a permanent museum that also opened in 1996. The Ars Electronica Festival, which began in 1979, is the premiere international gathering of its kind, attracting several thousand people from the electronic arts community who gather for discussion, debate, and exhibition. It's loud, public, and controversial, yet it's funded by the local and regional government. The City of Linz, ensconced in a particularly conservative region of Austria (and birthplace of Adolph Hilter), considers it a source of local pride. "Ask any cab driver there," says an Ars veteran.

Supporting Ars is paying off economically. FutureLab has increasingly earned income through external projects with industry. For example, Seimans commissioned it to develop an automobile navigation system. FutureLab developed INSTAR (Information and Navigation Systems Through Augmented Reality), a novel approach to combining graphic map information with real-time live video.

FutureLab has also developed its own products, usually as the results of art projects, including PC-based 3D modeling software, inexpensive VR goggles, and a projection-based worktable. FutureLab positions itself as offering its years of art experience to help solve user interaction and other design problems. Its Director, Horst Hoertner (who wears black from head to toe), sees no problem speaking with corporate executives about turbine visualization and "Tele-Symphonies," and about office products and the "Sperm Race," all in the same breath.

But FutureLab could never thrive, nor even exist, without Ars' base funding from the government. "We work with corporations out of choice, not out of necessity," states Gerfried Stocker, Ars Electronica Director. "Further," Gerfried continues, "by refusing to use the marketplace, you give up social and political relevance."

The Interactive Institute was established by the Swedish government's Foundation for Strategic Research in 1998 and is organized around semi-independent "studios" throughout Sweden. Each studio has its own theme, such as Emotions, Space, Tools, and Mobility. There are currently ten studios, supported for five years with base funding from the Foundation but expected to make their own connections with local industry, academies, government organizations, and the community at large. Michael Thomsen, the Director of Research, likens their approach to a "quadruple helix" of Culture, Academia, Politics, and the Individual, constantly rotating with each strand going in and out of the front view. He also sees Scandinavia as having three unique advantages: its user-oriented design tradition, its long-standing social consciousness, and its world-renown mobile communications industry.

"We're not interested in funding art, but in understanding technology and social development, where art plays an important role. Art can help us catch the long-term perspective without compromise," Thomsen continues. Their art projects have also given the Institute, and the Swedish Foundation, public visibility. "We get 3% of their funds and create 50% of their PR."

The Smart Studio in Stockholm is the Institute's most explicitly arts-oriented studio. "We call it prototyping here," says Smart Studio Director Ingvar Sjöberg, whose background is in fine arts. Their projects exhibit regularly at venues as diverse as art museums, corporations, hospitals, and prisons.

The Smart Studio's most visible project is the "Brain Ball," a game table with a rolling ball whose movements are controlled by the players' brain waves using electrodes. The Institute is moving the Brain Ball out of the research lab into the marketplace, in part to make it a commercial product but also to keep the Smart Studio free from the business issues. Everything done in all the Institute Studios are public and available. "Open sharing is the mantra of the day," says Thomsen.

ITP, IAMAS, and Ivrea - Academic Conviction

Tech-based art has taken hold in academia, driven from above by administrations seeing new areas of scholarship as well as new industries, and from below by students, having grown up with video games and the Internet. Most major universities now have some form of tech-based art program, and almost all are relatively new. Among the most ambitious are Arts Technology Center at the University of New Mexico, the Integrated Electronic Arts at Rensselaer (iEAR) Studios at Rensselaer Polytechnic Institute, and the California Institute for Telecommunications and Information Technology (Cal-[IT]^2) New Media Arts Research Layer at UC Irving and UC San Diego. This rush has created several vacuums: lack of experienced faculty, lack of relevant texts (particularly historical), and lack of a general plan for organization. Particularly since starting colleges and degree programs is a long, slow process, leadership is paramount.

NYU's Interactive Telecommunications Program (ITP) is one of the oldest and longest running tech-based art-related graduate programs in the world, founded in 1979 by Red Burns, who shaped it through her commitments to new media, community activism, and a connection to industry. Consequently, her program has simultaneously attracted students interested in being artists, activists, and entrepreneurs. One particular testimonial to the ITP's success is how its alumni are a famously tight-knit group. "It's all about people," exclaims Red. She continues to run the program and teaches the first-year required overview course. The ITP is known throughout the greater New York arts and media community for its end-of-semester exhibitions, two days of crowds of people and dozens of just-working projects.

The International Academy of Media Arts and Sciences (IAMAS) is a component of the vast high-tech infrastructure built in the past decade in Gifu Prefecture in central Japan. In the beginning, the governor of Gifu approached Itsuo Sakane, Japan's well-known art and science writer, teacher, and curator, for guidance. Sakane told him he would be involved only if there was an arts presence. The governor agreed and proposed that he start a school. IAMAS opened in 1996 as a two-year certificate program, and expanded to a graduate program in 2001. IAMAS is also known internationally for its biannual "Interaction" art exhibitions, interactive art shows rivaling those at the NTT InterCommunication Center, tech-based art's leading hub in Tokyo. IAMAS has also inspired similar institutions around Japan, including the Inter Medium Institute (IMI) in Osaka and the Center for Arts and Media (YCAM) in Yamaguchi.

One of the newest tech-based art related academies is the Interaction Design Institute Ivrea in Northern Italy, which opened in 2000 with the support of Telecom Italia and Olivetti. Unlike ITP and IAMAS, Interaction Ivrea has carved out its own specialty, "interaction design" which it defines as "a fusion of aesthetics and culture, technology and the human sciences." Its Director, Gillian Crampton Smith, is well-known for founding the Computer-Related Design Department at London's Royal College of Art in 1989. Interaction Ivrea is a combination two-year "mid-career" graduate program and a "collaborative design research studio." The studio's intention is to work with industry and with government on specific projects, "research getting concrete."

The CAT Lab and the Smart Lab - Academic Wildcards

The SmartLab Centre at Central Saint Martins College of Art and Design in London and NYU's Center for Advanced Technology (CAT) in New York were both established as unique academic non-departments with different but related missions. The CAT, established in 1993 with New York State funding, seeks to build bridges between NYU and the new media industries. The SmartLab, based in London since 2001 but with previous incarnations going back to 1990, is a "research incubator and production centre" specializing in site-specific and performance-based media art projects, funded largely by the Arts Council of England. Both labs encourage collaborative projects, both within their universities and with external partners. The CAT lab is more industry-oriented and the SmartLab is more culture-oriented, but with much gray area in both cases. Indeed, both labs are currently collaborating on several projects.

The CAT Lab has developed a wide range of technologies, working with NYU departments ranging from Computer Science and the Library to Medicine and Dentistry, often acting as a cross-pollinating agent. They patent their work and have successfully licensed their technology. Much of it relates to computer graphics, largely due to the work of Director Ken Perlin. Their projects with character animation, 3D display, and physical interfaces have been popular at venues like Siggraph. Since much of the CAT Lab's work involves making creative tools, it has always maintained connections with artists as well as with industry.

The SmartLab projects have been more cultural, interweaving tool making and activist intervention. For example, the Moroccan Cybercafe Project is an attempt to create online "safe spaces" for children and particularly for women, providing access to the Internet and to members of a larger creative community through local public cafes. The project is also a test bed for a multimedia tool set they've developed called SmartShell. SmartLab projects are often performance-based - its Director Lizbeth Goodman has her roots in theater - and highly collaborative, with interdisciplinary partners including universities, industry, and particularly with government. A large number of British and European government agencies are interested in creativity and information technology, ranging from the British Department of Trade and Industry to the European Union. "We're interested in taking industry into art more than art into industry," says Bronac Ferran, Head of Collaborative Arts for Arts Council of England, one of SmartLab's funders. Such art/government collaborations have virtually no analogy in the US.

MARS Lab and Banff Centre - Explaining oneself to the larger community

The Media, Arts and Research Studies (MARS) Lab, located in a castle near Bonn, Germany, is an art-based unit inside the Fraunhofer Institute for Media Communication, and the Banff New Media Institute (BNMI) is a research unit inside the Banff Centre for the Arts in the Canadian Rocky Mountains. Coming from different directions, both the MARS Lab and the BNMI are cognizant of how they must justify what they do to the larger community in which they work. Both groups are known for organizing lively seminars.

The MARS Lab was founded in 1997 by Monika Fleischmann and Wolfgang Strauss, "research artists" with long track records both making art and developing new technologies. Its umbrella organization, the government-funded Fraunhofer Institute, has the largest information technology research network in Germany, with over 4,000 employees. The MARS Lab brings to it "a critical approach" through its art projects and seminars. "We make the Institute visible" says co-director Monika Fleischmann. Much of the MARS Lab work consists of documentation and outreach through their portal netzspannung.org, a clearinghouse for their research, art projects, and workshops. The MARS Lab organizes major studies within the international tech-based arts community. For example, their current study, "Doorbuilders, Gatekeepers, Moneygivers, and Producers," is a survey of how media artists support themselves.

The BNMI is a high-tech media facility inside the Banff Centre, Canada's premiere learning center for the arts. The BNMI is surrounded by programs in music and theater, in sculpture and ceramics, in writing, and in Aboriginal Arts. The BNMI, like much of the Banff Centre, is supported by regional and national government agencies but has been increasingly seeking in corporate support. It has been successful producing tech-based art projects, such as the award-winning "n-Cha(n)t" by David Rockeby, and presenting them to visiting scientists. "Scientists have their head turned around here. They see how this work is relevant to their research," says Sara Diamond. She sees the BNMI as being a bridge, offering an idyllic setting to gather diverse groups to gain more experience with each other.

V2, C3, and the ZKM - Europe's venerable tech-based art institutions

V2 Organization (the Institute for the Unstable Media) in Rotterdam, C3 (the Center for Culture and Communication) in Budapest, and the ZKM (the Zentrum für Kunst und Medientechnologie) in Karlsruhe are all well-known European institutions. They all curate exhibitions, publish books and catalogs, and organize conferences and symposia. Together with Ars Electronica, they form the pillars of European tech-based art institutions, and are for the most part publicly funded. "It's goes back here in Europe to the Seventeen and Eighteenth Centuries: You have Bach, we have Hayden," explains C3 Director Miklos Paternak.

The ZKM is the largest, occupying a former munitions factory since 1997. It includes the world's largest media museum and a museum of contemporary art, a "mediathek" library, and two art institutes for the production of visual media, and music and acoustics. The building itself also includes a separate design college. The ZKM is supported by the City of Karlsruhe and the State of Baden-Württemberg. Artists from all over the world have residencies at the ZKM, in part because it supports large-scale projects. The ZKM has organized some of the most ambitious tech-based art exhibitions, complete with book-length catalogs, including "Net Condition," "[CTRL] Space" (on surveillance), and "Future Cinema." Karlsruhe, an hour south of Frankfort, is a medium-size city with a high-tech industry and a famous technical university, and the ZKM, with its strong international presence, is a source of local pride. Though it attracts an international audience willing to make

the pilgrimage to Karlsruhe, more local people are often inside the commercial cineplex across the plaza than inside the ZKM.

V2, based in Rotterdam since 1994, is smaller and more anarchistic than the ZKM, proudly concerned with instability and dysfunctionality over comfort and pragmatics. For example, V2 organizes monthly salon-like events called “Wiretap,” around topics such as “Death and the Machine,” “Time Collisions,” and “Distributed Vibes.” V2 is also responsible for the bi-annual Dutch Electronic Art Festival (DEAF), an international and interdisciplinary forum as prominent as the annual Ars Electronica festival. V2 is securely supported by the Dutch Ministry of Culture as well as by the City of Rotterdam, both of which see V2 as a resource for technical insights as well as for cultural activities, since it was an early hub for Internet and Web activities.

C3, in Budapest, began in 1996 as a program of the Soros Foundation Hungary, to explore and propagate art, tech, and new media. Initial support was for 3 years, during which time C3 developed Hungary’s first free email network, which by 1998 had over 100,000 users. It was sold to MATAV (Hungarian Telecom), and since 1999, C3 has been an independent organization. Without the benefit of the large industrial and government support afforded by Western European countries, C3 manages to organize large-scale exhibitions and presentations every year. Last year, for example, C3 organized “Vision - Image and Perception,” a collaboration between artists and neuroscientists which included an art exhibition, a symposium, and a publication.

Waag Society, Trinity Session and ToroLab - Erasing lines between art, culture, and business

The Waag Society, a “knowledge institute” in Amsterdam, and the two young organizations Trinity Session in Johannesburg, South Africa, and ToroLab in Tijuana, Mexico, represent new structures for exhibiting art, doing business, and taking a critical stance about culture.

The Waag Society is a not-for-profit foundation initially supported by the Dutch government and City of Amsterdam. It produces projects, publications, events, and products in four areas: Creative Learning, Interfacing Access, Public Research, and Sensing Presence. Last year, for example, the Waag organized a highly visible project with artist Esther Polak called “Amsterdam Real Time,” where volunteers carried with them custom-built “tracers,” consisting of a portable GPS unit, computer, and cell phone. The volunteers’ movements around Amsterdam were accumulated over several weeks and displayed as time-lapse and still-frame maps. Waag Labs is a for-profit spin-off company to commercialize products developed by Waag Society. “People who want to make money invest in people who want to make money. This is wrong for art: we just want to make normal money,” says Marlene Stikker, Waag Director. One such product is Piloot, an online composing environment designed for the disabled.

The Trinity Session and ToroLab are younger organizations founded by younger artists. Both groups see themselves as fast, portable, and highly adaptive, producing artworks and offering professional creative services while socially engaged. “We don’t get lost in the valorization of being creative,” explains Trinity Session’s Stephen Hobbs. In addition to producing video and exhibitions, Trinity Session has written a research study on visual arts and crafts in sub-Saharan Africa, commissioned by the International Labor Office in Geneva. Torolab has a particular interest in trans-border issues. For example, they produced a clothing line called “ToroVestimenta” made for border crossings, which is both practical, with secure passport pockets, and political, made to draw attention. To both groups, making art, being activist, and co-opting business strategies simply make good sense.

The Whitney and The Kitchen - Who supports the wave?

In the US, with the government largely out of the picture, a serious question exists around who supports new, edgy, innovative artwork that is ahead of any comparison, analysis, or known market value. The Whitney Museum of American Art, a pioneering venue for the new art, and The Kitchen, New York's long-standing alternative art space, are emblematic of how large and small institutions cope with such realities.

The Kitchen is one of the oldest surviving alternative art spaces in the US, having begun, literally, in a kitchen in 1971, and has nurtured several generations of young artists working on new concepts and with new technologies. Largely through its role as an artist meeting place, the Kitchen has maintained a street-level sense of what's hot and what to show. Like most other alternative art spaces, the Kitchen offers modestly priced memberships, but much of its funding comes from wealthy patrons, many of whom collect art. While one may be argue that collectors are motivated to support places like the Kitchen as an indirect means to expand their own collections, such patronage is also driven by larger, deeper forces. "Our donor base are really wealthy people who expect to be challenged and stimulated and to contribute to the fabric of New York," says Elise Bernhardt, the Kitchen's Executive Director. The Kitchen has chosen not to seek corporate funding. "Corporations are driven by the bottom line, while collectors are passionate and much harder to understand," says Elise. "Anyway, corporations want big numbers."

The Whitney is many times larger than the Kitchen but prides itself on being risk-taking for a museum of its size. The Whitney Biennial, "the show everyone loves to criticize," is the premiere forum for new art in the US. The Whitney, like many museums of its size, has a large base of wealthy patrons, as well as an endowment. "The new digital work is too unstable for most collectors and they worry that it's not archival," says Whitney Adjunct Curator of New Media Arts Christiane Paul, "and tech people don't collect tech art." The Whitney's Development Office is chartered in part to cultivate corporate support, including support from high-tech corporations. "It's all about eyeballs," says former Whitney Director David Ross. "The only exceptions are when corporate individuals fall in love with particular artists, like [Intel's] Andy Grove and video artist Bill Viola. Otherwise it's totally about PR."

The question remains why high tech individuals and high tech corporations are not engaged in high tech art. "Because too much of it is old wine in a new bottle," continues David. "The new wine is somewhere else."

Solway, Postmasters, and Gladstone - Art galleries with new recipes

Because of its instability, both technically and conceptually, art galleries have had difficult time representing and selling the new tech-based art. Several New York galleries, such as Paula Cooper, Sandra Gering and Bitforms, have become well-known for exhibiting various forms of electronic and digital art within the conventional gallery manner. But other galleries have attempted entirely different ways.

In 1993, the Carl Solway Gallery in Cincinnati moved into a 40,000 square foot former mattress factory and began fabricating art, including the work of video artist Nam June Paik. ''The secret of the art business is having great art. The way you get great art is either buy it, work through another dealer, or my way - which is actually having it created here,'' Solway said in 1998 [7]. Solway knew an art market existed for such work, it simply needed to be produced.

Since the mid-1990s, Postmasters Gallery in New York has been committed to showing art associated with new technologies. One art project, Netomat, a "meta-browser" for the Internet by artist Maciej Wisniewski,

premiered at Postmasters in 1999. Netomat was downloaded by over a million users in 80 countries and the following year formed the basis of a funded company. Another innovative strategy used by Postmasters is selling art editions with a twist: the editions are “unlimited,” where the price for progressive numbers goes progressively higher. This way, early buyers are assured that the value of their acquisition increases as more are sold.

Barbara Gladstone Gallery, also in New York, has a different, more ambitious, funding scheme. The gallery produces film and video production and sells limited editions as well as artifacts from the production. Matthew Barney’s five-part “Cremaster” movies, estimated to have cost several million dollars, were completely funded by the gallery. In 2000, a laserdisc of Cremaster 4, made in 1995 as an edition of ten, sold at auction for $380,000 and a set of 5 photographs from the film from an edition of three sold for $180,000 [8].

These new approaches to making and selling art, particularly for selling tech-based art, assume that art collectors are willing to pay large amounts of money for signed, original work. And though the business of art and art collecting is enormous, it’s full of ambiguities. For example, many, if not most, art galleries simply don’t make money, but are subsidized (e.g., deals with artists, spuosal support, wealthy families, etc.)

John Simon, Art Lexis, and Christo & Jeanne-Claude - Artists with newer recipes

Artists are developing their own new recipes for support, on their own, outside the gallery system. One particularly interesting dilemma for digital art, as well as and large-scale public art, is whether to make 10 items and sell them for $100,000 or to make 100,000 items and sell them for $10 each. The first approach takes money from the wealthy that can support free public exhibition, while the second sells art to the people for affordable prices: Robin Hood or Karl Marx.

John F. Simon, a New York artist working with new technologies, makes work that is physical (he’s represented by the Sandra Gering Gallery) and online. Among his most well-known works is a software art piece called “Every Icon,” which consists of a 32 by 32 grid of pixels. The 1,024 pixels, which can either be black or white, are programmed to cycle through every possible combination. John calculated that, at 100 updates per second, every combination in the first line alone would take 16 months. Adding the second line would take 6 billion years, and cycling through the entire grid would take a more-than-unimaginably-long time.

“Every Icon” is available for sale as a downloadable java applet on John’s web site for $20. Each unit is registered and numbered. “Every Icon” is unique for several reasons. First, it’s nothing but bits, only software. Second, John sells his work directly (via Amazon, actually) without the need for gallery exhibitions. Indeed, anyone can view the work directly on his web site. Finally, “Every Icon” deeply questions what is art and what is ownership of art.

Art Lexis is an online gallery of digital print art. Thumbnail images can be browsed and viewed in higher resolution, and a buyer can order a print in a variety of sizes and on a variety of papers for a reasonable price. Art Lexis operates like a gallery by soliciting and selecting artists and artwork it feels appropriate. Since the works exist as digital files, all prints are “originals.” The term lexis, coined by Danish semiotician Louis Hjelmslev, refers to “social determined units of cultural reception,” and Art Lexis intends to make fine art as ubiquitous and vital as pop art by offering alternatives to artificially limited editions.

On a completely different scale, the artist team Christo and Jeanne-Claude work in a genre that they practically defined: ultra-large-scale temporary public art. They have erected a 24 mile fence along the California coast,

hung a 365 foot high curtain in a Colorado valley, surrounded eleven islands in Florida with 6.5 million square feet of pink polypropylene fabric, and have completely wrapped several large structures including the Pont Neuf in Paris and the Reichstag in Berlin.

Everyone involved in the productions gets paid, and the public pays nothing to see these artworks. Christo and Jeanne-Claude completely pay for their projects through the sale of their artwork, mostly in the form of preparatory studies and they refuse to accept any licensing deals. They are their own art dealers. The sheer size and public presence of their projects generate their own economies. For example, the Reichstag wrapping cost $13 million, but according to a German newspaper, generated $700 million in increased tourism [9].

ProVenEx and NESTA - Fueling Innovation

Two relatively new, large-scale programs have attempted to fuel broad-based innovation by blurring the line between financial investment and social investment, one in the US and the other in the UK, each with differing approaches and metrics.

ProVenEx is the Rockefeller Foundation's Program Venture Experiment, which began in 1998, and has so far made 11 investments totaling $12.2 million. It funds ventures that have both a social and financial return, where the venture is willing and able to accept "sub-market" financial returns. ProVenEx is emblematic of the "Double Bottom Line" approach popular in the Social Enterprise movement today. Not surprisingly, ProVenEx has found so far that an "inherent tension" exists between SROI (Social Return on Investment) and FROI (Financial Return on Investment). It also found a lack of individuals capable of bridging both worlds, suggesting that the cultural space between the social good community and the for-profit business community is very large. The Double Bottom Line approach has indeed divided these communities, since many in the business community perceive accepting sub-market financial returns as simply bad business practice. But the Double Bottom Line approach continues to garner attention as more people from both communities explore ways to achieve symbiosis between money making and doing social good.

NESTA, the National Endowment for Science, Technology, and the Art, is a looser and larger experiment in the UK, founded in 1998 with £200 million (~$300 million US) from lottery funds. Its mission is to "explore new ways of finding and supporting UK talent and to help create a climate where creative endeavour is valued and can flourish." NESTA's investments, which they call "awards," are for Invention and Innovation, Education, and Fellowships. The Fellowships program, for example, supports science educators, film producers, and opera composers, for as much as £75,000 (~$120,000 US) for 3 years. NESTA makes little distinction between science, technology, and the arts in its priorities, and has looser criteria about what constitutes "return." Since it is new, NESTA acknowledges that even failures are valuable learning experiences.

The New Press, the Shape of Time, and Newman's Own - Alternative corporate models

André Schiffrin spent 28 years running Pantheon Books before founding The New Press in 1990, a not-for-profit but commercial book publisher, guided by its mission rather than by maximizing profit. It publishes books whose ideas are under-represented by the mass media, and it experiments with innovative marketing techniques. For example, when The New Press published "Picturing Us: African American Identity in

Photography," it decided to make a paperback for $14 rather than a costlier coffee-table book. It sold out immediately. It also won awards.

"Five corporations own 80% of the book trade in the US," says André. "When universities turn over their bookstores to Barnes and Noble, books by local professors often become impossible to find."

As a not-for-profit corporation, The New Press is eligible for foundation support, and has received grants from nearly 40 foundations. Yet, The New Press earns 75% of its income through the commercial marketplace. Its foundation support offers the leverage needed to successfully pursue their mission while simultaneously engaging with the marketplace. The New Press does not accept for-profit corporate money. "The nature of Masterpiece Theater has undeniably changed over the years because of Exxon funding," notes André.

An alternative business approach, specifically designed around tech-based art practice, emerged from 3-Legged Dog, a New York not-for-profit theater company. "The whole idea is to separate the money making from the art" explains Kevin Cunningham, a 3LD founder who formed a for-profit subsidiary called Shape of Time to protect and market intellectual property developed by 3LD. Shape of Time is wholly owned by 3LD. (Curious question: who owns a not-for-profit corporation, since it has no stockholders? "The mission owns it," says Kevin.)

"The box office covers the laundry," Kevin continues, "but we're developing tools for ourselves that have commercial value elsewhere." They have developed "Production Designer," a multimedia authoring system for stage use, and have patented, raised venture capital, and started another for-profit company to market it. Complicated? "Perhaps," he says. "It took 8 hours to start a for-profit company and 18 months to start our not-for-profit one. But we see this corporate structure as a means of fulfilling our long-term goal of total financial sustainability as artists."

A noteworthy third business model for supporting creativity and activism is simply to form a for-profit corporation and donate all profits to not-for-profit charities. Among the best known examples is (Paul) Newman's Own, which began as a salad dressing hobby with a desire for philanthropy and with a bit of humor: it's motto is "Shameless exploitation in pursuit of the common good." This model is much simpler than any involving not-for-profit organization, though it does open the possibility for closed books and opulent expenses (including salaries). Nevertheless, Newman's Own has donated over $125 million to thousands of charities since it began in 1982.

Computer Clubhouse and Viewpoints Research - Guided corporate support

The Viewpoints Research Institute (VPRI) has a mission of "improving both general education and understanding of complex systems" and has managed to create and give away software developed with the support of several large American corporations. The product, called "Squeak," is an authoring environment simple enough for 6 year olds to use. It was largely designed to help children ("of all ages") learn by constructing; Seymour Papert is on its Advisory Board. Squeak is a descendent of Smalltalk, the first dynamic object-oriented programming language, develop at Xerox PARC in the 1970s by Alan Kay, VPRI President. Alan joined Apple Computer and developed Smalltalk into Squeak in 1996, convincing Apple to make it freely available. When Alan went from Apple to Disney, Squeak went with him, and he built a team to continue development. Because Squeak is essentially in the public domain, it has attracted a lively and impassioned user/developer community. "Socrates said one should never get paid for teaching" notes Alan.

The original Computer Clubhouse was established in Boston in 1993, by the Computer Museum and the MIT Media Lab. Its intention was to offer young people in under-served communities the opportunity to "explore their own ideas, develop skills, and build confidence in themselves through the use of technology." Like VPRI, the Computer Clubhouse is heavily influenced by Seymour Papert's ideas on constructivism. The Clubhouse was indeed successful, and in 1999 Intel offered to establish 100 Clubhouses in other under-served communities worldwide. So far, over 75 have been established. Though they clearly provide Intel with positive publicity, the Clubhouses offer tools and expertise to young people within a well-established framework.

Burning Man and RTMark - Pushing the wave

Two organizations have pushed the boundaries of creativity and activism far beyond comfort and reason, and both have achieved success and popularity. Burning Man is an annual festival in the Black Rock Desert in Nevada, and RTMark is an anonymous activist web site. Both began as grass roots efforts, and neither is in it for the money.

RTMark (properly written ®™ark) is a "system of workers, ideas, and money whose function is to encourage the intelligent sabotage of mass-produced items." It acts as broker between ideas, funders, and activists, using a corporate style both as function and as parody. Proposed projects are organized by themes called "mutual funds" (e.g., war, health, media), for sponsorships and for online discussions. One of RTMark's early hits was brokering between a group of anti-war veterans with the idea and the funding, and participants, to buy large numbers of talking Barbie and GI Joe dolls, switch the voiceboxes, then return them to the stores' shelves, generating publicity via the "Barbie Liberation Front." Pushing parody beyond its known legal limit, RTMark has made caricature web sites of the World Trade Organization to announce its dissolution and of Dow Chemical to explain why the Bhopal catastrophe was justified in the name of shareholder value. Needless to say, not everyone was happy with these "funny parodies." Such projects cost little and generate a great deal of press coverage; hence in terms of its mission, RTMark is efficient and successful, and has earned the respect and popularity of a large international following. "I like to think we tread the fine line between clever and stupid," divulges RTMark's "Earnest."

As RTMark is anonymous, Burning Man is visible, and equally edgy. To call it a festival is deceptive; the organizers call it "an annual experiment in temporary community dedicated to radical self-expression and radical self-reliance." It takes place in the Black Rock Desert several hours drive from Reno, where all the buildings and services are brought in for the week (including, of course the giant burning man structure). Nevertheless, over 25,000 people come, a number that grows every year. Burning Man is based on participation and a gift economy. Tickets are not cheap, $165 - $250, to cover essential expenses such as toilets and medical help, but Burning Man's runaway success has generated enough revenue to fund art projects. As of 2001, it had distributed over $600,000 in grants to artists, making Burning Man one of the largest art funders in the US. It has since established the Black Rock Foundation to further promote interactive art. With or without funding, hundreds of art installations are created for Burning Man. The virtually unlimited space allows many of the art installations to be large, loud, bright, fast, and sometimes require scores of participants. (The Burning Man Web site has a section called "Creating Dangerous Art Safely.") Most of the art projects are made by non-professional artists as labors of love. Many are high-tech professionals, possibly, it has been speculated, drawn to the cyberspace-like empty expanse of the Black Rock Desert. As such, Burning Man has remained largely ignored by the mainstream arts establishments, but its sheer size, diversity, success, and weirdness makes it a significant force impossible to ignore.

Langlois and Creative Capital Foundations - Good ideas

The US National Endowment for the Arts is a frail shadow of what it was two decades ago because of two rounds of events. The first event culminated in 1989, when a Tupelo, Missouri, minister held a press conference to denounce the NEA for supporting "anti-Christian bigotry," referring to the work of artist Andres Serrano, setting off a firestorm in Congress. Shortly after, 107 congressional representatives signed a letter to the NEA calling Serrano's work, along with photographer Robert Mapplethorpe's, "morally reprehensible trash." The result was that the NEA stopped funding anything that anyone may consider controversial. The second event took place in 1995, largely as a response to the art controversies, when Congress cut the NEA budget by 40%. As a result, the NEA decided to no longer support individual artists (with the exceptions of literature, jazz, and heritage). A major source of support and encouragement for American artists, particularly those engaged in experimentation, had disappeared. Much of the strain was transferred to the foundation world. The Rockefeller Foundation, with its media arts fellowships program since 1988, was practically the sole supporter of experimental media arts in the US at this time.

Among the most organized art foundations' response was the founding of the Creative Capital Foundation in 1999, spearheaded by the Andy Warhol Foundation, along with 22 other funders. Creative Capital was establish to support individual artists financially, but also to act as a "full service" foundation, offering help with fundraising, public relations and marketing, and planning. "The idea was that artists would come out of this with skills, relationships and information they might not otherwise have had," explains Executive Director Ruby Lerner [10]. In exchange, the funded artists must agree to share a portion of any proceeds derived from the project, to be determined individually. In short, Creative Capital wants both an artistic and financial return on its investment. Though the odds are slim that such art projects will make any significant profit, the agreement is partially in case of a runaway success (a "Blair Witch Project," jokes Ruby). It also keeps everyone thinking about overall accountability. Grants range from $5,000 to $20,000 and are granted in four categories: media, performing, visual arts, and emerging fields. Thus Creative Capital has become one of the major potential sources for American tech-based artists.

Ironically, the other major source of support for American tech-based artists is Canadian. The Montreal-based Daniel Langlois Foundation was created in 1997 with a mission "to promote contemporary artistic practices that use digital technologies to express aesthetic and critical forms of discourse" and "to encourage interdisciplinary or multidisciplinary research projects." Daniel Langlois, its founder, was a young film director and animator at the National Film Board of Canada who founded Softimage in 1986, on the principle of creating 3-D animation systems designed for and by artists. Softimage, whose software is the industry standard for feature films, went public in 1992 and was acquired by Microsoft in 1994. The Langlois Foundation supports research residencies and is building an archive of tech-based and media art. It also funds organizations, with an emphasis on "emerging regions" such as Western Africa and South America, and offers grants to individual artists. These individual grants range from $10,000 to $100,000 Canadian (roughly $7,000 to $70,000 US) making the Foundation one of the largest tech-based artist funders in the world.

Eyebeam and ZeroOne - Hopeful ideas

They seemed like such visionary but reasonable ideas back in the late 1990s: to start a not-for-profit tech-based art organization and solicit the support of high tech corporations and of the emerging class of new young wealthy entrepreneurs who made their fortune from tech-based ventures. Eyebeam was founded in New York in 1996 with the dream of creating a tech-based "atelier" housed in a unique building, and ZeroOne (formerly GroundZero) was founded in Silicon Valley in 2000, with the dream of organizing the foremost

tech-based arts festival in the US. Then the Internet bubble burst. Both organizations are learning that the problems they now face are deeper than simply money.

Eyebeam Atelier was founded by John S. Johnson, a filmmaker with a background in math, science, and philosophy; experience with several arts and sciences not-for-profit organizations; and the wealth and social consciousness of Johnson & Johnson, his family's business. Eyebeam's mission is to engage "cultural dialogue at the intersection of the arts and sciences," which includes youth and family programs including a "digital day camp," panels and colloquia, and an artist residency program. Its crown jewel will be an ambitious new building, whose design was selected from a much-publicized competition that encouraged community dialogue. A public exhibition entitled "Open Source Architecture: Building Eyebeam" presented the submissions. The firm selected was Diller + Scofidio, and the building is scheduled to open in 2006 at its Chelsea location.

ZeroOne was founded by Andy Cunningham, a veteran Silicon Valley public relations executive who previously had spearheaded the "Interactive Media Festival," a splashy art and tech exhibition held in Los Angeles in 1994 and 1995 ("It was too early," she says). ZeroOne's mission is "to foster the magic that emerges from the intersection of art, technology and culture." It sees itself as the bridge-builder between the Bay Area arts community and the Silicon Valley entrepreneur and corporate community. Its dream is to create an annual "International Art and Technology Festival" in Silicon Valley beginning in 2005. ZeroOne currently organizes panels and events, with an emphasis on encouraging interaction between artists and potential patrons.

Even with the current economic downturn, high-tech wealth has not been as generous to the arts as was hoped. Andy sees three reasons why the Silicon Valley wealthy are not interested. First, many of them are engineers and "left brained" by nature. Moreover, many are young enough that arts in US public schools had already been cut back during the 1980s when they were in school. Finally, many are new in the area and have little commitment to settle, so they have little vested in supporting community culture. "They don't buy art here in Silicon Valley," she says. "They buy cars."

These reasons share a deeper common root: that the arts in the US are not perceived as essential components of a healthy community as they are in Europe and most elsewhere. Eyebeam and ZeroOne represent a new generation of hopeful exemplars, but their work is cut out for them. They will need to deeply change public perceptions.

Toward Sustainability

As can be seen from the exemplars, tech-based art has several different means of financial support. It's critically noteworthy that to some, selling one's art as a means of support is embraced and to others it's repelled. The same is true for supporting tech-based art by selling inventions, by receiving corporate sponsorship, by working for others, and by receiving grants or donations. When it comes to art and money, pride and shame are relative things.

Here is a first approximation for organizing these means of support, followed by some specifics for a hybrid art center and research lab, offered as a "straw dog" for discussion and criticism.

Commercial or Not?

A distinction must be made whether financial support is commercial "market money," or not. Market money is earned, as commercial transactions. Non market money is granted or donated, either from a government source or from a granter or a donor, who may receive a tax deduction for them since they are considered for the social good.

Having total freedom and control are often considered paramount to artists and researchers, hence the ideal means of support are through grants and donations, with no pressure for any financial return on investment. Others believe that having a connection to the marketplace is grounded and healthy even if it requires compromise.

The reality for most artists in the US is that grants and donations for total support is unlikely and alternative support, by definition, requires working somehow within the for-profit commercial framework. This is, of course, the definition of financial sustainability.

Commercially Selling IP and Licensing Patents

Artists working with new technology often invent by necessity. It's rarely our primary motivation, it just happens. If the invention can be identified, and if it can be patented, and if a market exists for the patent, the artist can receive royalties from licensing it.

Intellectual property can be broader and fuzzier than inventions and patents. For example, when the MIT Media Lab offers "insights" to corporate sponsors, it's selling IP in the form of privileged and paid-for information gathered from colloquia, demos, and "schmoozing."

IP in the arts can also mean copyright, selling original "expressions" such as music or imagery. Creative Commons, a new not-for-profit organization, has initiated a noteworthy system of several types of copyright licenses, which an author can post on works.

But IP in the context of invention usually means patents, and the question of whether or not to engage in patent protection hits a central nerve in the tech-based arts community, often through misconceptions.

So first, a distinction must be made between inventions by a massively distributed community and inventions by a single person or a small group. The Open Source movement is emblematic of a distributed system, often with thousands of collaborators working on different facets of a single project, like bees in a hive or ants in a colony. Whether or not such projects are protectable, they are clearly in a different class than ones by inventors in a garage or artists in a studio.

Next, a distinction can be made between “good patents” and “bad patents.” And the line between can be fuzzy, there appears to be a great deal of consensus on this. Bad patents are padded, vague, and ambiguous, often by intention. It’s no secret that the US Patent and Trademark Office is overburdened, understaffed, and generally under-equipped to handle the vast increase in quantity and variety of patent applications today. This is true in most other countries as well. Inventors and lawyers know this, and some take advantage of the situation, bullying their way into getting patents allowed. Such patents are often used to intimidate potential infringers, “in terrorem.” Once a patent is issued, contesting it is costly and time-consuming. Bad patents are usually deemed as such by the professional community, often quickly and forcefully. On the other hand, a truly novel and non-obvious invention, clearly described, and with reasonable claims gains the respect of its community.

A common perception about patents is that they are expensive, with figures from $20,000 to $200,000 quoted as typical costs. Most patents are applied for by large corporations with their own internal legal infrastructures. Patents are seen as components of large portfolios, like cards in a deck, used for licensing and for fighting infringement, often as much by quantity as by quality. Patents are big corporate business. Asking a patent lawyer if patents need to be expensive may be like asking a surgeon whether you need surgery, but writing good patent applications, particularly writing the claims, is an art in itself and requires deep knowledge about the subject matter. Most patent lawyers have specialties.

Another reason patents are expensive is because lawyers wish to make sure everything protectable is claimed. The standard procedure is to overclaim, then get beaten back by the patent examiners, thus assuring maximizes claim of the IP territory. Once, for example, when a patent application of mine went through the PTO quickly and all claims were allowed, my lawyer considered it a failure that he didn’t claim more.

Finally, a big reason why patents are expensive is because of the follow-up required to get any payback. At the very least, licensing requires marketing. But common wisdom in the entrepreneur community is that the gold lies at the end of the development cycle, and taking the invention to the marketplace by starting a company is where the real wealth is. To many entrepreneurs, applying for a patent means starting a company and includes raising venture capital far beyond the cost of a patent application.

In addition to expense, another down side of patents is the need for secrecy: public disclosure means potentially losing ownership. In the US, inventors have one year to file after public disclosure but may lose right for foreign filings. Ironically, the original raison d’etre for patents was to encourage open flow of information by sanctioning ownership as an alternative to trade secrets. Still, a period of time exists, before filing, when an invention is unprotected and the inventor is exposed to giving it away.

One potential opportunity for tech-based artists and other non-corporate inventors is to write “provisional” patent applications, a less formal alternative to actual patent applications, which acts as a one-year placeholder. Provisional patent applications give inventors some time and some protection to find support.

Another potential opportunity is to simply shoot for less inclusive, but no less rigorous, patents and aim for more modest licensing deals rather than committing to a full-blown start up venture. Lawyers will resist because potentially valuable claims may be missed and business people will resist because potential profit isn’t maximized. But the public, not to mention the PTO examiners, may embrace this approach, and though it may be lower risk and lower gain, its “bang per buck” ratio may be high. It’s also a lower compromise and lower headache alternative, and therefore may be a better fit with an artist sensibility.

Commercially Selling Originals and Editions

Another potential opportunity for supporting tech-based art is directly selling the work itself, as originals or as editions. If the work is entirely digital, no distinction exists between original and edition. Such sales could be low cost and low overhead through Web-based cottage industries or could be expensive and tuned to the art collector market through the gallery system. The question currently unanswered is what does it take to open the door to the untapped market of high-tech collectors.

For one thing, any collectible tech-based art needs to be extraordinarily robust and archival. High tech industrial and exhibit designers understand this, and collaborations between them and tech-based artists would be fruitful.

Collectable tech-based art may require modification and compromise, particularly if the original artwork is large or is an installation. Most collectors are not willing to dedicate entire rooms to single art installations the way museums can.

Collectable tech-based art may also involve blurring the line between fine art and expensive novelty. If, as suggested, the new high-tech rich buy cars instead of art, perhaps the art has to be more car-like, offering immediacy, relevance, and intense experiences. The region between collectable fine art and expensive high-tech machines remains largely unexplored.

Commercial PR Sponsorship

Corporations spend extraordinary amounts of money to make their brands visible to the public. Since most art is publicly exhibited, sponsoring art for visibility is a justifiable corporate expense. In theory, the amount that corporations will pay for exposure is simply math, taking into account numbers of eyeballs, demographics, and relevance of the audience to the corporations' products.

But in practice, it's not. For example, American and European companies differ in attitude about sponsoring art beyond math. Sometimes they are even the same companies. For example, recently a New York based media artist emailed a representative of a well-known American software company inquiring about using their product in exchange for public credit. No reply. The artist then emailed an equivalent European rep for the same American company, who responded immediately and positively. Forces deeper than simple math and good business are in play. "The corporate people who support art in Europe actually come to the festivals," observes writer/curator Timothy Druckery.

In the past, corporate support for tech-based art has been almost entirely for PR, sometimes with mixed motives. "Corporate funding of tech-based art in the US in the 1960s and 1970s was inextricably connected to PR," says art historian Edward Shanken. "Amidst the Vietnam War and rising environmental concerns, corporations like American Motors, which sponsored the Software exhibition at the Jewish Museum in 1970, funded the arts as a method of white-washing their tarnished corporate image."

A subtle but important difference exists between corporate PR sponsorship and corporate foundation sponsorship. Corporate PR sponsorship is a commercial business transaction, a legitimate expense that can be justified to shareholders. Corporate foundation sponsorship is a grant from a not-for-profit organization to further its not-for-profit mission. Any benefit to the for-profit corporation is, in theory, secondary and via good will. A not-for-profit arts world veteran reported to me that she recently filled out a corporate foundation grant proposal, where one of the questions was "how will your project benefit the for-profit corporation?" She was appalled, more by its blatancy than anything else, since such questions are always present but usually more implicit.

It may disturb some artists to have their work supported purely to attract attention, specifically tech-based artists interested in having technical impact inside tech-based corporations. On one level, these corporations are saying we don't care about what you're saying, just give us the eyeballs, like court jesters. But, as commented by Gerfried Stocker, Ars Electronica Director, "So you don't shape the tech department but you may influence the kids of these people."

Corporate PR support for the arts may be changing as well. An old story, often heard from corporate PR offices, was that the new arts community was too small, too poor, and too marginalized, that PR money is better spent on TV sitcoms and soccer matches. Today, tech-based art has become more mainstream and its audience has expanded. Also, the Internet has made it possible to target niche markets effectively.

Artists and art centers will have to do their homework regarding the math. The burden of proof is on us, but it may be well worth it.

Commercial External Services

Another means of support for tech-based art is to sell external services, such as consulting or commissions. Many artists consider this an economic necessity rather than a choice, but others do not. Oliviero Toscani, founder of the Benetton-funded Fabrica Center near Venice, believes that "pure art" is "masturbation" and "contaminated art" interests him most. "Michelangelo worked for the Pope," he says.

A distinction can be made between external services taken by choice, as part of one's art practice, and external services taken by necessity, such as a "day job." Oliviero, as well as the Ars FutureLab, have been highly successful at being able to pick and chose their clients, and simply fold them into their art practice. Others may not be so lucky or talented, and a broad continuum exists in the middle, including, for example, artists teaching art professionally.

Another distinction must be made between art as profession and art as hobby. The low entry cost of tech-based creative tools opens the door to children, to the elderly, and to "Sunday Painters," people who make art with no intention of making any money, working purely as a labor of love. MIT Faculty Michael Hawley, who won the 2002 Van Cliburn Amateur Piano Competition, observed "the most wonderful part was watching the glow emanating from the contestants. You don't see this in professional competition."

While such tools and activities clearly need to be encouraged, it does not nullify the role of the professional artist. Selling external services, ranging from commercial application of their craft to waiting tables, may offer the only viable means of support.

Grants and Donations

Grants and donations are generally given to individuals or to not-for-profit organizations. Not-for-profit organizations don't have shareholders and are controlled by their not-for-profit mission. Any money earned must go back into the organization. Not-for-profit "fund-raising" for grants and donations has a distinctively different style and culture than for-profit "deal-making" for market money.

Many not-for-profit organizations don't wish to make market money of any kind and believe any form of interaction with the marketplace erodes its mission. A charity fighting AIDS in Africa might consider it inappropriate to make any money in the marketplace. For other organizations, it's a matter of choice, if they

can afford it. “I don’t want the Internet Archive to ever make money” states Brewster Kahle, its founder and principle funder.

In the US, given the current economic and cultural climate, many not-for-profit art centers have been unable to thrive from grants and donations as in Europe. The ones that survive usually operate on a fraction of their ideal operating costs. Many have developed a counter-productive “shoestring mentality” - an inability to efficiently manage, sluggishness, and general pettiness - easy for outsiders to view critically.

Tech-based art has the advantage of seeking grants and donations from both the arts and the tech side. Pursuing tech-based grants and donations for tech-based art offers unique opportunities, but the burden of articulating how an art project can benefit a tech funder is on the artist. The European tech-based arts community is aware of this and has been particularly successful making the connections.

A Sample Plan

The Arts Lab would be a unique hybrid art center and research lab. It would be a physical space in which tech-based art is researched and produced. A critical mass of projects, perhaps eight, would be in production concurrently. Projects would have a one-year average duration and cost $500,000 per year, half of which covers the overhead of a support infrastructure. The $250,000 per year supports the artist and 1-2 dedicated staff people fulltime and possibly several interns, plus covers project-specific equipment and expenses. As a $4 million per year art and tech facility, the Arts Lab would be unique in the US.

The Arts Lab would be not for profit. Its mission would be to produce tech-based art and to support its public exhibition, publication, and demo. It would also actively engage in the marketplace. Enough evidence exists from the exemplars that a little bit of grant and donation subsidy can help fuel successful market money transactions. Besides, being 100% reliant on market money is equivalent to “privatization,” and aside from any ideological considerations, opportunities would be lost. Being not for profit would also help gain the trust of potential artists and of the general community.

As a not-for-profit organization, the Arts Lab would be eligible for grants and donations, and would seek a small but significant portion of its revenue in this way, perhaps 25% like the New Press, for two of the eight concurrent projects. These two Arts Lab projects would be more of an activist or “social good” nature, harder to find their own support. These funds, free of commercial obligations, are similar to what Irving “Swifty” Lazar, the legendary Hollywood agent, liked to call his “fuck you” million.

The Arts Lab would seek an equally small but significant portion of its revenue through selling outside services such as consulting and commissions, another 25% and another two of the eight projects. Such projects would entail working for others, primarily for corporations, like the Ars FutureLab, and would embrace commercial work. These funds could be considered “mercenary.”

So, two of the projects would be intentionally activist and supported by grants and donations and another two of the projects would be intentionally commercial and supported by contracting corporations.

The remaining four projects would be openly solicited. With such budgets, little doubt exists that the quantity and quality of project proposals would be extraordinarily high. The selection process would be through review, and it’s tempting to suggest two independent committees: one purely for art and the other purely for technology, where successful proposals must be selected by both committees.

Potential revenue to support the four projects would come from IP, from PR, and from direct sales of originals and editions.

Projects would be “mined” for nuggets of invention. The Arts Lab infrastructure would be capable of identifying, protecting, and marketing potentially valuable inventions. Patent law is highly specialized, and such expertise is critical for well-defined and accurate claims. The same is true for marketing inventions. Hence the Arts Lab would rely on networks of patent lawyers and marketers.

The Arts Lab would err on the side of openness rather than secrecy, with an “if in doubt, publish” rather than an “if in doubt, patent” attitude. If the Arts Lab occasionally misses some value, its positive credibility in the professional and general communities will more than compensate. The goal is to produce only “good patents.”

It’s difficult to project numbers on patent licensing revenue, since it is as hit-based as making a movie. It’s actually worse, since heavy marketing can successfully hype a bad movie, while patents are based on utility. It is, however, safe to assume that IP licensing alone can not be expected to fully cover the costs of production. Says Interval Founding Director David Liddle: “I’ve worked on this a lot, and it’s simply unrealistic to think patent licensing can support a lab. Sure, you and your friends can sit around your living room and eat potato chips and just write patent applications - it’s been done - but this isn’t research.”

Another potential source of revenue is from corporate PR and marketing. Since such opportunities are primarily related to the visibility of Arts Lab projects: art works, exhibitions, publications, etc., they are probably best left to case-by-case instances, for example, for supporting a particular exhibit in a particular venue.

Finally, a third potential source of revenue is direct sales relating to the projects, either as originals or editions. The goal would be to nuture the potential market for tech-based art collection and would be done in conjunction with a professional exhibit making company, like the Exploratorium’s Exhibit Services group. It would also rely on professional art marketers. For example, suppose an Arts Lab project is shown at a known venue like Ars Electronica and receives acclaim. First, art marketers would determine how collectable it may be, in terms of size, weight, noise level, lighting requirements, etc. If alterations are proposed, the artist would have to approve. Then, exhibit makers would review the specifications and determine the fabrication price. A particular project may cost $10,000 per unit in equipment and fabrication to make ten. Can these be sold for $60,000 each?

Regarding ownership, the Arts Lab would own everything and artists would receive equitable royalties if their projects succeed in making money. The exact percentages can be worked out, since the Arts Lab must be a place with a positive reputation in the arts community. But it’s also important that the Arts Lab is not a place where people come primarily to make money. It would be where creative people can realize a project of their dreams, have an affect on culture and the marketplace, and participate in building a foundation for others after them.

Interim Strategies

How long would such an Arts Lab need to prove the concept? A modest estimate is five years, perhaps with 100% funding in place for the first two years and 50% funding for the next three. It would indeed be pleasant for $14 million to just appear. But interim strategies exist, which may provide early tests of the concept, as well as provide needed services for the creative community today.

At the top of the list is an Artist Patent Agency, an organization to help tech-based artists identify, protect, and market inventions that may have resulted from their work. It would be based around a network of patent lawyers and marketers and would be a not-for-profit corporation, both for grant and donation eligibility and for reasons of trust. If potentially valuable IP is found, the APA would pay for its protection and marketing in exchange for a percentage of any royalties. The upside is that it would cost very little to an APA start today.

The downside is that it could not fund projects but only provide potential revenue after the fact. The Shape of Time is the best model today for such an undertaking.

An analogous organization could also start today with little seed funding: an Artist Editions Agency, which would review, possibly modify, fabricate, and sell editions of tech-based art. Like the APA, and for the same reasons, the AEA would be not for profit. It would consist of a network of marketers and an agreement with an exhibit fabrication facility. The Carl Solway Gallery is a good model, as was Andy Warhol's Factory (which also was a major social gathering place). No one has done it right for tech-based art yet, and perhaps a not-for-profit attempt would make the break-though.

Another analogous organization would be an Artist PR Agency, with virtually all the same properties as the APA and the AEA. The goal of the APRA would be to match tech-based art projects with corporate sponsors willing to pay for the exposure. Again, no one has done this right for tech-based art yet.

These three agencies, an APA, an AEA, and an APRA, each take the three potential market-based revenue sources for tech-based art, and do it as not-for-profit organizations. Indeed, they could be combined. But they don't fund art; revenue is all after the fact. All three could demonstrate whether the basic ideas outlined here could work, and could help revise and refine them. And if they are successful, they will have served badly needed functions today and provide initial funding for an Arts Lab in the future.

Epilogue - Who champions the Future?

We have an untapped creative army.
-- Holly Sidford, Coordinator, Urban Institute, New York

Holly's project is based on a unique national survey whose results will be reported in Investing in Creativity, a study currently in-progress. She elaborates: "There are currently at least 2.5 million professional artists in the US, according to the IRS. They have twice the unemployment rate of any other professional group with similar education backgrounds."

Arts funding in the US has been plundered by fear of dialogue, fear of controversy, and fear of exploration. The fear has trickled down from the government into all aspects of corporate and community life. "Existence proof" of the enormous leverage of relatively small amounts of government funds for the arts exist elsewhere, particularly in Europe. Major opportunities are being lost, particularly in the high-tech sector, where technologies are outpacing creative applications.

Sadly, the world once knew a uniquely American spirit in the arts - of risk-taking, of wit, and of innovation. This spirit is being threatened with extinction.

The US government has been driven to fear any support of art that anyone may consider offensive. This "can't upset anyone" dynamic is almost impossible to undo, so the situation is unlikely to change any time soon (I'm in favor of a checkbox on tax forms which says "I do/don't support weird and difficult art," as a solution.)

Corporate funding for the arts could be considered a good investment in the long term. An argument can be made that building better schools, keeping the air and water clean, and supporting public culture is the best thing any corporation can do to insure a productive work force in the future. When taking the long view, social and financial returns on investment converge.

The deficiencies left by the lack of US government arts funding combined with the current economic slump in the technology sector has created a moment extremely ripe for a new generation of Medicis to arise, wealthy individuals with a passion for art, possibly with a high-tech connection. A wide open niche exists.

"The arts have been asked to carry a larger conversation," continues Holly, "bigger questions about what we value in a democracy, including tolerating and encouraging debate." The conversation is not about what is "truth and beauty, or freedom. In this post post-modern era, the conversation is about nurturing a culture that values the debate.

For the tech-based arts, these issues have particular resonance, since it is these powerful new tools that are radically reshaping the world. The dream of connecting the world is on the verge of fulfillment, and if artists don't play a significant and pro-active role, it will be left by default to advertisers, the military, organized religion, and sex peddlers. Some of us believe the stakes are high and the moment is opportune.

We *are* in an inflection point.

List of Participants

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September 2002 - April 2003

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Timothy Druckery, Writer/Curator, New York
Tod Machover, Director, Hyperinstruments Group, MIT Media Lab, Cambridge
Wolfgang Strauss, Co-Director, MARS Lab, Fraunhofer Institute, Bonn
Yukiko Shikata, Curator, Tokyo

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Ars Electronica <http://www.aec.at/>
Ars Electronica Centre <http://www.aec.at/>
Ars Electronica FutureLab <http://www.aec.at/en/futurelab/>
Art and Innovation (book) <http://mitpress.mit.edu/catalog/item/default.asp?sid=04BA9F3F-2D09-41CA-B8C6-2F016C9D25D7&ttype=2&tid=3769>
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Banff New Media Institute (BNMI) <http://www.banffcentre.ca/bnmi/>
Barbara Gladstone Gallery <http://www.gladstonegallery.com/>

Bitforms Gallery <http://www.bitforms.com/>
Black Rock Foundation <http://www.blackrockarts.org/>
Burning Man <http://www.burningman.com/>
C3 (the Center for Culture and Communication) <http://www.c3.hu/>
Carl Solway Gallery <http://www.solwaygallery.com/>
Center for Arts and Media (YCAM) <http://www.ycam.jp>
Christo and Jeanne-Claude <http://www.christojeanneclaude.net/>
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Royal College of Art Computer-Related Design (CRD) Department <http://www.crd.rca.ac.uk/>
RTMArk <http://www.rtmark.com/>
Sandra Gering Gallery <http://www.geringgallery.com/>
Shape of Time <http://www.shapeoftime.com/>

Siggraph <http://www.siggraph.org/>
Smart Studio <http://smart.interactiveinstitute.se/>
SmartLab Centre <http://www.smartlabcentre.com/>
The Tech Museum of Innovation <http://www.thetech.org/>
Torolab <http://www.torolab.com/>
Trinity Session <http://onair.co.za/thetrinitysession/>
UC Cal(Cal-[IT]²) New Media Arts Research Layer <www.calit2.net/art>
UNM Arts Technology Center <http://atc.unm.edu/menu/menu.htm>
US National Endowment for the Arts <http://www.nea.gov/>
V2 Organization (the Institute for the Unstable Media) <http://www.v2.nl/index.php>
Viewpoints Research Institute (VPRI) <http://www.viewpointsresearch.org/>
Waag Society <http://www.waag.org/>
Whitney Museum of American Art <http://www.whitney.org/>
Xerox PARC <http://www.parc.xerox.com/>
ZeroOne <http://www.groundzero.org/>
ZKM (the Zentrum für Kunst und Medientechnologie) <http://www.zkm.de/>

Author Biography

Michael Naimark is an independent media artist and researcher with over two decades of experience investigating place representation and its consequences. He has worked extensively with field cinematography, interactive systems, and immersive projection, and has been a longtime member of the Society for Visual Anthropology.

Michael was on the original design team for the MIT Media Lab in 1980 and was a founding member of the Atari Research Lab (1982), the Apple Multimedia Lab (1987), and Lucasfilm Interactive (now Lucas Learning, 1989). He joined Interval Research Corporation as it opened in 1992, and worked an additional year after it closed in 2000 on his webcam spin-off venture, Kundi.com.

Michael received an undergraduate degree in Cybernetic Systems, an independent honors major, from the University of Michigan in 1974 and a graduate degree in Visual Studies and Environmental Art from MIT in 1979. He is on the Board of Directors of the ZeroOne Foundation in Palo Alto; the Board of Advisors of the National Art and Technology Network in New York and the Media Lab Europe in Dublin; and the Editorial Boards of Leonardo Electronic Almanac and Presence journals, both from MIT Press.

Michael's art projects are in the permanent collections of the Exploratorium in San Francisco, the American Museum of the Moving Image in New York, and the Zentrum fur Kunst und Medientechnologie in Karlsruhe. His 3D interactive installation "Be Now Here," produced with the cooperation of the UNESCO World Heritage Centre, is currently on tour in the ZKM's "Future Cinema" exhibition.

Michael is the 2002 recipient of the World Technology Award for the Arts.