Experiments in Corporate Collaboration: The Case of the Ars Electronica FutureLab

by

Stephanie Davenport

B.A. French Studies (1994)

University of Pennsylvania

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Signature of Author.....
Department of Comparative Media Studies
May 9, 2003

Certified by.....
Jing Wang
Professor, Chinese Cultural Studies
Affiliated Faculty, Comparative Media Studies
Thesis Supervisor

Accepted by.....
William Uricchio
Professor & Acting Director, Comparative Media Studies

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Abstract

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The Ars Electronica FutureLab is a thriving interdisciplinary research facility located in Linz, Austria. It is part of the Ars Electronica Center (AEC), a cultural institution which for over two decades has been a pioneer in exploring the interface between art, technology, and society and mediating public interaction with new technologies. As a nonprofit organization, the AEC is primarily supported by key public sector partners including local government and the state broadcast company, as well as corporations. This institutional framework, together with university affiliation, has facilitated the FutureLab's diverse activities from artistic to more commercially oriented projects exhibited in the AEC 'Museum of the Future' and at off-site venues. The FutureLab's team of artists and researchers has forged a unique hybrid research model focused on three core research areas (virtual reality environments, interactive installations, digital surfaces) which allows them to take prototypes developed from artistic projects and apply perfected solutions to industry projects, or vice versa. Increased demand especially from the private sector for the lab's cutting-edge technology developments and research expertise now threatens to upset the delicate balance of this model.

Today, AEC management needs to address the issue of sustainability for both its FutureLab division, in face of heavy workloads, and the institution at large, given decreasing government funding for arts/culture. The AEC is devising a strategy for cultivating industry partnerships based on the FutureLab's experiments in corporate collaboration to date which have been successful namely because they are focused on mutually beneficial outcomes. Through this strategy, the AEC is eager to supplement corporate sponsorships with longer-term industry partnerships in order to ensure financial stability. FutureLab employees stand to gain additional resources and, therefore, the ability to sustain their current research model and continue doing cutting-edge work. With the AEC and the FutureLab, corporations have access to a dedicated arts community whose expert staff can help them develop and promote interesting projects as well as meet both their business needs and corporate affairs objectives.

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Introduction

Research Site

This thesis examines the significance of the *Ars Electronica FutureLab*'s relationships with corporate partners. The FutureLab is an applied research and development (R&D) facility established in 1996 that operates under the umbrella of the *Ars Electronica Center (AEC)*, a nonprofit cultural institution in Linz, Austria. Applied R&D involves the use of pure research to develop real-world products. While the FutureLab describes itself as a think tank that thrives on open-ended research of new media technologies, its team of modern-day Leonardos—interdisciplinary artists and scientists—ultimately focuses on developing high-quality projects related to three core research areas: virtual reality (VR), interactive installations, and digital surfaces. In addition to fulfilling a primary mandate to build installations for the *AEC 'Museum of the Future,'* the FutureLab also works on a wide variety of projects for external clients, including organizations from the public and nonprofit sectors and, especially, the private sector (See **Figure 1**).[1].

Institutional Context

Ars Electronica has become a widely recognized trademark embodying the cutting edge in digital culture. The institution is known for its risk-taking approach—from pioneering new forums in order to mediate public interaction with new technologies and experimenting with innovative cultural programming, to developing ambitious interdisciplinary research projects and testing new hybrid management structures. The primary mission of AEC to chart the intersections

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[1] < http://www.aec.at/en/futurelab/thelab.asp>

between art, technology and society through its various divisions is ultimately predicated on the idea of collaboration to the extent that the survival of the institution at large fundamentally

Figure 1: Snapshot of the FutureLab	
Year established	1996
Location	Linz, Austria
Affiliation	Ars Electronica Center
Employees	25 mostly full-time staff, not including interns or visiting artists and researchers
Mission	"Formulate and implement future innovations at the nexus of art, technology and society"
Scope of activities	Applied research "think tank" and production center
Core research areas	Virtual reality (VR) environments Interactive installations Digital surfaces
Portfolio	200+ projects to date
Primary client	AEC "Museum of the Future"
Other clients	Private, public and nonprofit organizations
Key research partner	Kepler University Department of Business Informatics/Software Engineering Group, Linz

depends on an extended family of partners. The Linz city government and the ORF (Austrian public broadcasting system) were both instrumental in establishing the *Ars Electronica Festival* and accompanying *Prix Ars Electronica* awards competition (the earliest divisions and cornerstones of the organization) and then, later, in building the Museum of the Future and the FutureLab (the divisions responsible for educating a wider public about the future of technology, including but wider than annual Festival attendees). Ars Electronica coexists in a network with

other nonprofit cultural institutions focused on new media arts programming and interdisciplinary research.

In addition to gaining fundamental public sector support, in my opinion, the AEC's core focus on technology made partnership with industry inevitable at every stage of the institution's development since technology development is primarily driven by the private sector. Forward-thinking executives and employees at various corporations (from local Austrian companies to multinationals) have sought out affiliation with Ars Electronica ever since the first Festival. For the last several years, the well-respected director of a research lab of a local university in Linz (Software Engineering Group at Kepler University), along with his team, have served as intermediaries between the FutureLab and new industry partners.

Key Question

Throughout my analysis I attempt to address the question: *What conditions ensure successful collaboration?* I use the term collaboration to describe the two-way exchange of resources and ideas. When individuals from different organizations collaborate, the primary motivation is to pool human and financial resources in order to solve problems and generate mutually beneficial outcomes. My thesis title—'Experiments in Corporate Collaboration'—plays off the name of a legendary interdisciplinary research initiative—Experiments in Art and Technology (EAT)—that was active in the late 1960s and early 1970s. Like EAT, Ars Electronica found its calling as an innovative organization devoted to exploring the impact of technology on society. While EAT faded after a making a big splash with some landmark projects co-developed by artists and engineers, a network of partnering institutions has provided a strong basis to support Ars Electronica's long-term and evolving ventures in corporate collaboration.

Motivation & Relevance

My background in corporate sponsorship of cultural programs motivated my investigation of industry involvement with the FutureLab and its parent institution. I developed a case study to better understand the momentum of the FutureLab's activities after a period of substantial growth, as well as the ensuing organizational challenges and strategies for both the FutureLab and the AEC. After building a sizeable portfolio of projects in just six short years, the FutureLab has reached a crossroads. It is now facing a rapidly expanding project load, especially given external demand for some of the team's recent 'in-house technology developments'—namely a PC-based virtual reality platform called the 'Arsbox.' In other words, this case study comes at a pivotal moment in the FutureLab's history when it must decide how to manage change without upsetting the delicate balance of its unique research model. AEC management is supporting the lab at this moment of transition. It is also looking at the FutureLab's successful approach in working with industry to help shape the institution's overall strategy for more effective corporate collaborations.

Policy makers in the US and Europe are proposing measures to build better support systems for interdisciplinary research. The Futurelab appears to have developed a research model that is particularly successful, one that is based on a strong institutional framework and unique research approach. While the FutureLab has operated in relative obscurity until now, AEC management feels the time is right to launch the first ever public relations campaign to promote the lab's activities to wider audiences. Documentation of the FutureLab's activities at this juncture will hopefully serve as a useful point of reference after further organizational change. I attempt to offer a third-party assessment, ultimately framing the analysis through the lens of. corporate affairs strategy. I leave detailed comparisons between the FutureLab and other research models to a later iteration of this study and, also, to other scholars.

Methodology

I conducted field research on two trips to Linz. During the first visit, I worked for one month with the AEC director of marketing and public relations before and during the last Ars Electronica Festival (August-September 2002).[2] I witnessed the FutureLab staff in action at their busiest time of the year, taking in their suite of new installations in the AEC Museum, ongoing demos and lab tours, and a large two-day symposium. When I returned to Linz in January 2003, I occupied a desk in the FutureLab for two weeks and observed the day-to-day routine, including staff meetings, impromptu demos for visitors, presentations by a recently arrived artist-in-residence, preparations for a special event at the Museum involving a FutureLab VR project, and the general flow of conversation and teamwork within the main work space. Although the atmosphere during the second trip was relatively calm, staff was working actively on projects for other clients and was starting to prepare new projects to debut at the next Ars Electronica Festival.

My data is largely qualitative. I used a purposive sampling approach to organize my primary interviews during the field research trips, working closely with AEC management and FutureLab staff to a select a representative population of current employees, research partners, and sponsors. My interview questions were semi-structured. I especially wanted to hear from staff about their strategy vis-à-vis working with corporate partners and how they thought these collaborations could and should evolve. I tried to get a sense of past project histories and retention of organizational knowledge. Although there has been some turnover at the FutureLab over the past six years, several people who helped found the lab or joined soon thereafter remain there today, including the director along with at least three others, the so-called 'key researchers,'

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[2] I began studying Ars Electronica in 1999 when I met the AEC director at an art/technology conference that my company co-sponsored in Silicon Valley. I then visited the Museum during the summer of 2000, at which time I met the AEC's director of marketing and public relations.

each one heading up one of the lab's three core research areas. Therefore, these interviewees provided particularly valuable insights about the balance between working on art projects for the AEC and undertaking various commissions and collaborative projects with external clients, especially from the private sector. To help me contextualize my study, I conducted additional pilot interviews with recent FutureLab artists-in-residence plus a seasoned media artist-researcher (the author of a major feasibility study related to hybrid arts and research centers, as mentioned in Chapter 1). I also had many conversations with a range of scholars, artists, curators, and other professionals working in new media arts and/or interdisciplinary research programming.

Structure

Through a descriptive analysis, I try to lay out the main factors that explain the current state of FutureLab's relationships with corporate partners. Chapter 1 tells the *FutureLab story* within an historical context, examining the institutional framework supporting its activities. Chapter 2 takes a detailed look at the basic features of its *unique hybrid research model.* Finally, Chapter 3 considers the current economic landscape forcing changes in management structures of cultural institutions alongside trends in corporate affairs strategy, moving the AEC at large and the FutureLab toward more *meaningful corporate collaborations*. Keeping this structure in mind, the chapters can be read in any order. I attempted to outline the most pertinent issues in a way that is informative to both those unfamiliar with Ars Electronica and others (e.g. policy makers, museum directors, other scholars) interested in gaining some new perspective on the activities of one of the institution's most dynamic divisions.

Chapter 1

The FutureLab Story

What's in a name? For the Ars Electronica FutureLab, the *Ars Electronica* prefix says a lot. It associates the research and development (R&D) center with the Ars Electronica Center (AEC), a world-renowned nonprofit cultural institution. For nearly twenty-five years, the AEC has built an international reputation for championing the work of new media artists through its annual Ars Electronica Festival and Prix Ars Electronica awards competition. The institution has also focused on mediating a wider public's encounter with new technologies primarily via its 'Museum of the Future.' Across all divisions, Ars Electronica is known for its forward-looking approach. Rather than simply documenting history, it aims to imagine the future emerging at the interface of technology, art, and society. It was only fitting that Ars Electronica founded a laboratory dedicated to fulfilling that mission.

Although the FutureLab has operated in relative obscurity up until now, it is quickly becoming better known to the outside world as a distinct entity of the AEC. The FutureLab story is an important one in the overall history of Ars Electronica. In addition to pursuing a primary mandate to create new installations and shoulder technical operations for the AEC Museum, the FutureLab also sells its R&D services to a wide range of external clients, particularly corporations but also other nonprofit and public organizations. Within six short years, it has amassed a portfolio of 200+ projects, including artistic and more commercially oriented work. Given the fact that the FutureLab is part of a nonprofit cultural organization, what made the pursuit of such diversified activities possible? The answer is the strong institutional framework that supports the lab.

A look at the evolution of the Ars Electronica project—focusing on the period of the development of the Museum when the FutureLab was also established—provides a context for understanding the scope of the lab's activities. From the time it was a fledgling institution up through the present time, Ars Electronica has always depended on the support of an extended family of partners—a hybrid network of institutions from the public, private, and nonprofit sectors. Thanks to the continuing investment by the local government and endorsement from the Austrian national broadcast company, Ars Electronica was able to firmly establish itself and, over the years, pursue ambitious objectives. Other emerging media arts organizations participated in and supported its activities. Perhaps most significantly, Ars Electronica's early and ongoing connections to industry were inevitable as well as being an increasingly integral part of the organization's operational strategy since technology development is primarily driven by the private sector.

Together, Ars Electronica's institutional partners have, in effect, created opportunities and set important boundaries for the FutureLab, especially in terms of facilitating and supporting its relationships with industry. The lab's position as part of a well-connected and respected organization has opened the door to many commercial research opportunities. This situation has also provided a natural boundary of sorts since FutureLab staff and AEC management recognize the importance of maintaining credibility first and foremost as a cultural institution. Until now, the FutureLab has been able to successfully manage industry projects due to its strategic alliance with a local university research lab.

The FutureLab story also needs to be considered in relation to other organized interdisciplinary (i.e. artist-researcher) programs that emerged during the latter half of the 20th century. In the 1960s and 1970s when rapid advances in technology were radically altering society, visionary artists and scientists began collaborating, with the goal to pool creative

resources to mediate technology change. In the 1980s and 1990s, a wide variety of centers of innovation, art labs, future labs, and media centers cropped up in a different institutional settings, such as universities and corporations, or as independent cultural centers and labs. All of these laboratories depended partially or wholly on industry support. Like at Ars Electronica, the key to each of these labs success has been in the way the institutional framework of supporting partners was constructed and operationalized.

- Why were early public sector investors interested in shepherding the Ars Electronica project? What was at stake?
- Why was the FutureLab established and what is the FutureLab's relationship to the AEC Museum?
- How did Ars Electronica create an environment to foster interdisciplinary research? How does its institutional model compare with others in different settings?

1.1 Ars Electronica: Foundations of an Institution

> *The challenges set in place by a generation of committed but dispersed artists, engineers, writers, curators, and theorists found a focal point in the improbable city of Linz... Ars Electronica's strong and public international presence has been an influence on nearly every other initiative in a field now conceptualizing the role of technology and art.*[3]
>
> Timothy Druckery

In its original incarnation, Ars Electronica emerged as a festival in 1979, founded by a team of visionary media artists and theorists[4] along with key collaborators from the government of the City of Linz (the capital of the Province of Upper Austria, a small town known primarily for its steel industry) and the local studio of the ORF (the Austrian national public broadcasting system, the country's most prestigious broadcast network). The Ars Electronica Festival provided

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[3] From media scholar Druckery's introduction to *Ars Electronica: Facing the Future*, a catalogue published in conjunction with the AEC's 20th anniversary (1999: 19)

[4] Cyberneticist/physician Herbert Franke; Electronic musician and composer Hubert Bognermayr

a venue for pioneers in the then-burgeoning electronic music scene. The kick-off event was dubbed the Linzer Klangwolke or 'Cloud of Sound,' an outdoor musical extravaganza, and was organized in conjunction with the International Bruckner Festival (Brucknerfest), a classical music concert series held at the new opera house on the banks of the Danube. Both festivals became part of the City's plan to craft a distinct cultural image that would help distinguish Linz from the Austrian cultural capitals, Vienna and Salzburg. At stake was the livelihood of the region. There was a perceived need and desire to reinvigorate the social fabric of the community.

Although not atypical in Europe, where government has traditionally provided majority support for arts/cultural initiatives, the Austrian government has generally been very conservative, investing primarily in the cultural heritage, i.e. state museums, opera houses, music festivals. Yet the timing of Ars Electronica founders was right. More liberal federal government policies during the 1960s and into 1970s created a fertile climate for innovative artistic movements that profited from special state subsidies.[5] The second Festival was held in 1980 and continued as a biannual event through 1986, still alongside the Brucknerfest. The Klangwolke was a popular success during the first several years, drawing huge crowds from the city and outlying region. As one journalist pointed out in a recent article about "The Infrastructure Behind Ars Electronica's Success," this grand event ensured steady support from the local government and allowed Festival organizers to forge ahead with other more esoteric programming of conferences and other side events related to a nascent cyberculture (Dietrich 2000).

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[5]"In the 1960s and early 1970s, innovative artistic movements and critical artists profited from state subsidies, although the sums used for innovative arts were always only a small part of those invested into the cultural heritage. It was a time of social-democratic success in both German and Austrian politics, German Social-Democrats invented the formula 'culture for everybody' and Austrian Social-Democrats followed the German lead. What they meant was, more precisely, 'high art for everybody.' Theatres and museums should lower their symbolic as well as financial thresholds in order to attract broader social strata." Excerpt from: "Arts Politics–Contemporary Arts–Political Science" a paper by Monika Mokre, director of the Austrian cultural policy making organization FOKUS (2002).

Ars Electronica went through a period of expansion and internationalization in the mid 1980s. The Festival became a stand-alone event by 1986. It has consistently attracted a 'who's who' list of innovators, including artists, theorists, scientists, curators, etc. Festival organizers have attempted to maintain a dialogue about current intellectual trends with their core constituency by planning the program of events each year around unifying themes—from artificial life to information warfare.[6] The Festival was one of the world's first to address the artistic possibilities and social impact of new technologies. Hannes Leopoldseder, an executive at the local ORF studio and a chief architect of the Ars Electronica project, summarized the organization's original vision:

> *Ars Electronica is an event for electronic arts and new experience that assumes a character of incalculability, of risk, and of daring to try something new. At the same time, however, we are posing a challenge to artists, technicians, cultural critics, and ultimately to the public encountering new forms of expression in art.*[7]
>
> Hannes Leopoldseder

The key concept here is the notion of risk taking. Ars Electronica was not the only institution of its kind in Europe to emerge during the 1980s and develop into 1990s.[8] However, Leopoldseder and crew have secured Ars Electronica's position as being arguably the leader among its network of peers.

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[6] Festival themes have included 'Art and Artificial Intelligence' (1987), 'Digital Dreams-Virtual Worlds (1990), 'Welcome to a Wired World' (1995), 'Infowar' (1998), 'Next Sex: Sex in the Age of its Procreative Superfluousness' (2000) and 'Unplugged: Art as a Scene of Global Conflict' (2002). The 2003 theme is 'Code: The Language of Our Time.'

[7] Leopoldseder to this day remains the most steadfast advocate for AEC activities. This quote was excerpted from his essay in the retrospective catalogue *Ars Electronica: 20 Years of the Festival of Art, Technology and Society* (1999: 32)

[8] Other early new media art institutions in Europe included ZKM (Zentrum fur Kunst und Medientechnologie Karlsruhe) in Karlsruhe, Germany (1989), New Media Institute in Frankfurt, Germany (1990) and ISEA (Inter-Society for the Electronic Arts) in the Netherlands (1990).

1987 marked a major turning point in the organization's history with the establishment of the Prix Ars Electronica, a juried competition to honor the best in computer arts. As the new media art world equivalent to the Oscars, the Prix Ars Electronica awards ceremony has been staged each year at the ORF studio in Linz and broadcast on national television. Today, the 'Golden Nica' is arguably the most coveted international award in the field. Jurors select a handful of winners in several categories from a pool of thousands of submissions coming from 63 countries, with total prize monies today now equaling 100,000 Euros.[9]

As an organization with an ambitious mission and bold programming, it was bound to attract some kind of controversy. Criticism has come particularly in relation to the Prix. Ars Electronica. Ars Electronica was accused of selling out to the corporate world since it has allowed major media companies (namely Pixar, a leading Hollywood animation studios and repeat award winner) to submit entries alongside independent artists with more modest means to produce their work. This will continue to be a challenge since it seems there is no reversing the process. In other words, it is out of the question really to bar companies from participation since they have become such an integral part of the Festival—as Prix contenders, actual and potential AEC sponsors, and perhaps most importantly as organizations that are well-positioned to help promote Ars Electronica to wider audiences. Festival organizers did in fact at one point realize the divergence within the field. In 1998, they split the Computer Animation category of the Prix in two—into commercial (i.e. visual effects) and artistic work. However, they were remerged in 2000 since that categorization did not effectively filter submissions into two groups.

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[9] Currently, the categories in the Prix Ars Electronica competition include Net Vision / Net Excellence, Interactive Art, Computer Animation/Visual Effects, Digital Music and cybergeneration (under 19). The categories have changed over time: an Interactive Art category was added in 1991; the Computer Animation category in 1998 was divided into commercial (i.e. visual effects) and artistic work, but then remerged in 2000; the net art category was added in 1995 and, by 2000, was broken into the two subcategories net vision and net excellence.

The more important point to underscore here is that the introduction of an awards competition for an emergent art form was a brilliant public relations move. Festival organizers recognized that by establishing a prestigious competition, they were filling a need in an art community and reinforcing the pioneering position of Ars Electronica. The Prix also raised awareness about the institution among a wider public, especially a larger pool of international artists. The visibility of the competition undoubtedly pushed the management of the Festival to a more professional level. Ars Electronica naturally wanted to put its best foot forward on national television, but also in front of an onslaught of other media outlets (especially European) that descended on Linz to cover the Festival. The trend setting image of Ars Electronica helped energize the local arts community. so that it soon became the undisputed center in Austria for media arts. In addition to the main events at the AEC Museum and the Brucknerhaus, each year Festival events are now staged at galleries, town squares, and other venues throughout the city.

Along with the focus on culture, another major motivating factor to investment in the Ars Electronica project by the public sector was the desire to reinvigorate the local economy as times grew tough. The director of cultural affairs in Linz explained some the factors that influenced municipal cultural policies: "The global structural crisis in the primary industry sector in the mid-eighties had a negative impact on the major corporations located in Linz and thus on the economy of the region as a whole. The reaction of the municipal authorities was to launch an economic development program aimed at improving the operating framework for trade and industry and making Linz an attractive location for investors from home and abroad."[10] Festival organizers targeted companies in the IT and communication industries. Partners included a range of Austrian and European companies as well as local divisions of important multinational companies.[11] Many

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[10] "Linz—City of the Future" in *Ars Electronica Center: Museum of the Future* catalogue (1996: 21-22)

[11] AEC sponsors into the era of the new Museum included *Austrian and European companies*— Creditanstalt (banking), Österreichische Brau (brewery), Quelle Versand (retail consumer products), Siemens (computer & telecommunications hardware/software)— and *local divisions of important*

businesses, eager to associate themselves with the cultural avant-garde, sought out affiliation with the experimental project on their own, especially during the boom period of the early 1990s. One early partner was Siemens, a German-based multinational company, which provided prize money for the Prix for several years.[12] Based on the momentum they had managed to generate in the first decade of operations, Festival organizers realized that the project could be taken a step further in order to reach wider audiences.

1.2 Establishing the 'Museum of the Future'

Leopoldseder and his colleagues decided to literally build on the success of the Festival. They proposed opening a space that could serve as the permanent public face for an expanded program of Ars Electronica activities. According to Leopoldseder, "The Ars Electronica Center will be one of the first media centers in Europe to provide a broad audience with access to digital technology in exemplary applications from the most diverse fields, thus granting the public a glimpse of what lies ahead for us in the digital world—in education, instruction, in art and culture, in science and industry."[13] Whereas a week long Festival could consistently attract a crowd, the challenge would be to draw traffic to the Museum on a year-round basis. True to the Ars Electronica spirit, they forged ahead with a 'if we build it they will come' attitude.

City officials agreed to fund the building project in 1991. The local government imagined the Museum as an important public relations tool in support of its plan to position Linz as a leading center in Europe for the New Economy, whereby yesterday's industrial order gave way to

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multinational companies— Hewlett-Packard (computers and electronics), Digital Equipment Austria (now part of HP), Ericsson Austria (telecommunications hardware), Kapsh (B-to-B telecommunications systems), Microsoft Austria (computer hardware/software), Oracle (computer hardware), and Silicon Graphics Austria (computer hardware): from Leopoldseder "From Idea to Reality," in *Ars Electronica Center: Museum of the Future* catalogue (1996: 41)

[12] Siemens has a wide portfolio of activities, from development of communications technology hardware and software to industrial automation systems. <http://www.siemens.com>

[13] "Welcome to the Wired World" *Prix Ars Electronica 95* catalogue

a more complex, dynamic and dispersed economy shaped by information technologies, global markets and new communications networks like the Internet. According to one city official, the Ars Electronica Center would stand as a symbol of the city's forward-looking orientation and competence. Public funding was noteworthy given the extra expenses needed to run a technology-based museum. They nevertheless imagined the traditional museum model as being a valid approach to exhibiting new media projects, essentially embracing this challenge posed by cyber artist and theoretician Roy Ascott:

> *The museum does not clarify our perceptions so much as codify them. Museums are never passive...*
>
> *The convergence of computers and communications is producing an environment in which many cherished institutions and artistic practices are feeling challenged, threatened, or just plain redundant, as exemplified not least of all by that triumph of ideological instrumentality, the museum.* [14]
>
> Roy Ascott

Along with key local government allies, many corporations joined forces with Ars Electronica to help build the Museum. In addition to financial support, it received significant corporate in-kind support (i.e. products and services) for the technical infrastructure and the expensive equipment necessary to operate some of the earlier media art projects. Among those sponsors were Telekom Austria, Hewlett Packard, and Gericom (an Austrian computer manufacturer). Ars Electronica entered into a new, more intimate phase of relationships with corporate partners as the latter now benefited from year-round visibility through the Museum.

Just as the building project was itself a risky move, the Ars Electronica board decided to try out a new management strategy. They hired Gerfried Stocker, a new media artist well known

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[14] From the online article "Museum of a Third Kind" (Ascott 2001). NOTE: Roy Ascott is a pioneer of interactive computer art. Ten years before the invention of the personal computer, Ascott started positing theories about interactivity in computer-based forms of expression as an emerging issue in the arts. In addition to participating in many of the early Festivals, Ascott was the source of the inspiration for the 'AEC Lift' project mentioned later in this chapter.

in the Austrian arts community,[15] to become director of the AEC. Stocker assumed both key administrative responsibilities and duties as co-artistic director for the institution at large.[16] As he recalled, "A decision was made to look for an artist to lead things here instead of going by the typical museum model, i.e. selecting a business person as executive director as well as second person to be artistic director. In other words, the idea was to get a person who was perhaps unconventional in his thinking and in tune with what was going on in the art scene." In a recent interview, he recalled the strategy he and his team used for generating interest in the new Museum project:

> *We would call meetings with targeted companies at the construction site saying, 'You have to come by and see for yourself what's underway.' Even though there was just a big hole in the ground, it was important to have them come and feel the palpable energy surrounding the Museum site.*
>
> Gerfried Stocker

In order to lend credibility to the project, AEC management brought the mayor of Linz to meetings with local business leaders. ORF executive Leopoldseder handled outreach to more content-related companies, e.g. media and entertainment industry.[17]

The Museum opened in 1996. The new facility was outfitted with a totally wired classroom space/media lab for public programs, as well as a café and lounge, the SkyMedia Loft, where special presentations could be staged for schools groups, private businesses and other organizations. They hired a staff of experts who could mediate the public's encounter with new technologies. That included 'Infotrainers,' tour guides able to assist with the equipment operation,

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[15]Stocker organized an artist collective called 'xspace' which received Prix Ars Electronica honorary mentions twice in the early 1990s. He described xspace as a kind of prototype for the FutureLab, developed in collaboration with artist/scientist Horst Hoërtner. Stocker eventually nominated Hoërtner for the position of FutureLab director.

[16] Christine Schopf, an executive at the ORF, is the co-artistic director of Ars Electronica.

[17] The AEC board of directors includes several local public officials, including the mayor of Linz, as well as local industry and university representatives.

explain technical details, and make tours through the Museum galleries an exciting experience for everyone from school children to senior citizens, from the most tech savvy visitors to the technologically challenged.[18] The AEC also recruited a small group of artists and scientists to form the Ars Electronica FutureLab, an in-house research and development shop that would be responsible for most of the major projects on display in the new Museum space.

1.3 The FutureLab Takes Shape

Many of the original FutureLab staff members—about half a dozen people, all Austrian citizens—had some kind of direct connection to Ars Electronica as participants in the Prix competition and Festival employees. All trained in art and/or technical universities. A few worked as independent artists or ran small design firms of their own just prior to joining the AEC. They all found themselves in a unique situation. The FutureLab provided a place where they could refine their particular areas of expertise and also experiment in new fields, from 3D animation to software development for supercomputing, leaving major administrative concerns to AEC management.

At this 'applied' research center, staff would at once be able to focus on intensive research activities, with access to state-of-the-art equipment and a new facility, and produce demos and polished exhibitions showcasing the most cutting-edge innovations. While motivated by the opportunity, the original FutureLab team also understood the enormous task at hand, i.e. the central role they would play in upholding the reputation of the AEC by assuming the bulk of responsibility for realizing the new Museum project. One of the AEC's main objectives, as is the case for any cultural institution, has been to sustain interest among key constituents (artists,

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[18] An AEC 2002 press backgrounder reports an average annual attendance at the Museum of 100,000 visitors (based on studies conducted by Market, a polling agency in Austria, and Kepler University in Linz). Given the AEC location in a relatively small town and its niche focus, the Museum's attendance figure is significant compared with the average annual attendance for Austrian museums in general which is over twice that level (UNESCO World Culture Report 2003).

funders, Museum goers, Festival goers) while also generate positive media coverage of Ars Electronica activities. That, of course, translated into presenting evocative programs and exhibitions.

AEC technical director and senior executive developer/director of the FutureLab Horst Hörtner recalled the organization's vision of the road ahead:

> *Right from the beginning, there was a common belief among the Ars Electronica Center management team that we had to be able to create something interesting in order not to end up as a dusty museum after a few years—to become not only a showcasing venue, but also a place where important and exciting projects happen.*
>
> Horst Hörtner

Despite the importance of its mission, the FutureLab functioned as a more or less invisible division of the AEC during the first several years. As Hörtner described things, "The plan was to have some kind of operation dedicated to architectural development and production using new media instruments, but there was no intention at that time to have a dedicated space for the FutureLab." For the first several years, the FutureLab shared office space with AEC management in a building adjacent to the Museum.

The FutureLab staff has steadily grown in size to about 25 mostly full-time staff, plus a handful of university interns. Today, the team consists of a mix of architects, game developers, physicists, 3-D modelers, media and product designers, graphic artists, computer scientists, scholars in communications studies and sociologists. Their experience ranges from graphic design, animation and video production to computer programming, systems analysis, informatics, and even solid-state physics. In 2001, the FutureLab finally moved into a separate facility next door to the Museum.

1.4 Primary Mission: Animating the Museum

The FutureLab team has focused on developing core competency in three major research areas, those most appropriate for outfitting and maintaining a digital museum: *virtual reality environments* (3-dimensional computer simulations of real space), *interactive installations* (computer-supported interaction in real space), and *digital surfaces* (interfaces that mediate user interaction with digital content, moving away from screen-based interfaces toward other solutions, such as projection-based interfaces). The FutureLab was also charged with handling Museum technical support. It writes all documentation (e.g. wall text, gallery guides) for the Museum installations and briefs all Museum Infotrainers. [19] The FutureLab's biggest project to date was their very first: designing and building the new Museum's technical infrastructure, as well as conceptualizing and developing most of the original installations that debuted at the Museum opening.

Some of the FutureLab's inaugural installations for the Museum included: the 'AEC Lift,' two different computer animation sequences synchronized with the main elevator's movement—one simulating the Apollo 13 rocket liftoff and, in another, a trip through the human body; and 'Humphrey' (1996), a flight simulator with head-mounted display, allowing viewers to fly through 3-D virtual worlds while literally suspended in space. Among some particularly ambitious projects for the Museum, in terms of the technical development involved, were: 'TeleZone' (1999), an installation bridging virtual and real worlds, allowing users to build and populate a physical model of a city housed in the Museum via the Internet; and a pioneering experiment in force feedback technology, pitting Museum visitors against virtual opponents in a game of 'Tug of War' (2000).

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[19] While in the beginning the FutureLab also provided technical support for other AEC operations, such as broadcasts of symposia during the annual Festival, it now concentrates on projects for the AEC Museum and its own set of external clients.

As primary producer of the Museum installations, the FutureLab has had the formidable task of introducing new projects at a steady enough pace to sustain visitor interest, and then once installed, ensuring their smooth operation. It is particularly challenging given the infrastructure and technical maintenance involved in technology-based projects. In order to deal with this challenge, the FutureLab focuses on updating the content in some of their more popular installations. For example, the team created a version 2.0 of the Humphrey project, guiding viewers on a virtual tour of the AEC Museum itself that totally refashioned some of the existing gallery spaces and projects onsite.[20] Another way to introduce change has been to present projects developed by outside artists, particularly those by visiting artists-in-residence and scientists. In many cases, the FutureLab provides the work facility and development support for many projects by visiting artists. The AEC has also always displayed work by international artists and scientists, many of them Festival participants. One of the most popular installations on view to this day is 'TeleGarden' (1996) by Ken Goldberg that allows users to grow seeds in an actual garden installed at the AEC via the Internet.

The FutureLab team works closely with the Ars Electronica director Stocker who curates all Museum exhibitions. Together, their main objective seems to be to challenge visitors to think about new technologies first and foremost as tools for creative expression. That is, in the Museum, projects labeled as 'art' (e.g. those developed by the FutureLab, Prix winners, independent artists) are displayed alongside research projects that some might say could otherwise be viewed in a typical science museum. For the curatorial team, the challenge, then, is to clearly communicate their holistic vision to the public, through the Infotrainers, gallery wall texts, installation design, special events, private tours, etc. Perhaps more importantly, the greater test will be to guard against the possibility of that vision becoming stale, i.e. predictable, since it

[20] As of the writing of this paper, the FutureLab was in the midst of designing Humphrey version 3.0.

is largely driven by one person. In a recent strategy which appears to address this potential problem, the FutureLab is starting to stage themed exhibitions occupying most of an entire floor of the Museum.

The 'Hidden Worlds' exhibition, which opened during the 2002 Ars Electronica Festival, showcased a variety of projects, from interactive art installations to design oriented industrial demos, co-created with a wide range of collaborators. By presenting projects as a thematic ensemble, they are perhaps more accessible and make more of an impact on the average viewer. 'Hidden Worlds' featured several *augmented reality* (AR) projects which involve taking a real scene viewed by the user and 'augmenting' the total experience by presenting additional information in an overlaid virtual reality scene generated by a computer. The FutureLab worked with visiting researchers to co-develop 'Aussichtsposten,' or Vantage Points (a pair of monitors through which users encounter virtual characters while scanning the real space of the gallery), and 'Info-Benches' (virtual portals that display movements in the lobby captured on camera, allowing users to navigate through the Museum information directory). They collaborated with Siemens on 'INSTAR,'[21] a global positioning system (GPS) monitor situated on a car driver's instrument panel that displayed real-time video image overlaid with graphic route recommendations to help the driver navigate in an intuitive fashion. Finally, lab staff provided technical assistance on two projects developed by artist-in-residence Golan Levin with Zachary Lieberman, both the exhibition centerpiece 'The Hidden World of Noise and Voice,' and a complementary project 'RE: MARK.' Each one presented a new approach to visualizing sound.[22]

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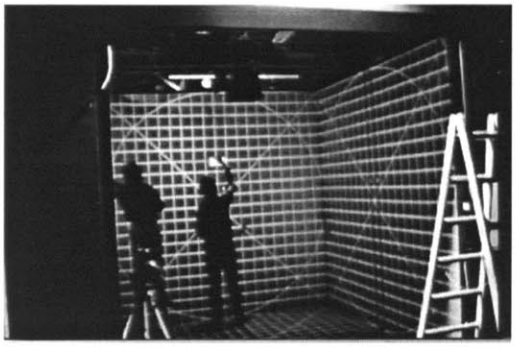
[21] INSTAR is a series of research projects focused on mobile augmented reality that the FutureLab is working on in collaboration with Siemens. While AR technology is increasingly being used in industrial fields, the FutureLab/Siemens collaboration centers around pushing the potential of AR technology into the consumer electronics sector.

[22] Levin and Lieberman will be returning to the FutureLab to perfect the technology underlying the project and prepare a performance based on this piece for the 2003 Ars Electronica Festival.

The FutureLab has focused a lot of time and energy on animating the 'CAVE' Virtual Reality Theater,[23] a state-of-the-art platform for the presentation of totally immersive VR experiences, which became the centerpiece of the new Museum (See **Figure 2**).

Figure 2: CAVE, Virtual Reality (VR) theater



Constructing the theater space

VR installation in CAVE

(Images from AEC ©2003)

Silicon Graphics (SGI) donated the professional workstations required to operate the CAVE to the AEC as a form of sponsorship. It was a real coup, since each server cost from several hundred thousand to a million dollars, not to mention the fact that it would be the very first CAVE operational in Europe. Both AEC management and local government officials realized the importance of the FutureLab's job to ensure that space was permanently animated. As Stocker recalled, "At the time, SGI was like the Holy Grail. We were fortunate that our contact person there was somehow inspired by the Prix Ars Electronica competition and impressed by our overall mission and reputation."

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[23] The CAVE was created in 1992 by Dave Pape and team at the Electronic Visualization Laboratory (EVL) at the University of Illinois in Chicago which specializes in VR and real-time computer graphics. In 1992, EVL premiered the CAVE at the SIGGRAPH trade show for the computer graphics industry. Ars Electronica representatives were in the audience for that presentation and shortly thereafter started discussions with the developers at EVL.

The CAVE was originally designed to give scientists new methods of visualization and used mostly by large research institutes, many of them working on visualizations for industry. [24] Yet as computer scientist and VR pioneer Brenda Laurel once put it, "The greatest potential for virtual reality lies in art making." Virtual reality was one of the new technologies that many artists were experimenting with in the early 1990s, and many coveted the opportunity to work on a large scale VR projects for the CAVE.[25] The AEC claims that the CAVE in Linz is one of the few placed primarily in the service of art. The first CAVE visualizations that the FutureLab collaborated on with visiting artists were Franz Fischnallers' 'Multi Mega Book' (1997) and Maurice Benayoun's 'World Skin' (1998).[26] (See **Appendix I** for a partial listing of descriptions of VR projects developed by AEC artists-in-residence and research associates in collaboration with FutureLab staff) However, the FutureLab has also worked on 3D visualizations for industry clients from the very beginning. What the FutureLab essentially did was use the AEC CAVE to blur the boundaries between art and commercial projects.

1.5 Building a Clientele: Focusing on Corporate Partners

The FutureLab is gaining widespread recognition as a reliable vendor and a leading applied research center in its areas of expertise. The team has tried to raise the lab's visibility via various outreach efforts, from teaching in local universities[27] and publishing papers in scientific

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[24] Companies in the heavy industries typically commissioned university research institutes for CAVE VR simulations of manufacturing processes, machine design, etc. Given its multi-user, interactive, and highly immersive characteristics, CAVE simulations became popular among a wide range of professionals working in education, entertainment, industrial design and manufacturing. But, again, the high cost of the workstations was prohibitive, limiting their widespread diffusion.

[25] Many artists have worked with the original CAVE developers at EVL, including some FutureLab staff.

[26] 'World Skin' won a Prix Ars Electronica Golden Nica in the area of interactive art in the 1998 Ars Electronica Festival.

[27] Several FutureLab employees teach at the Fachhochschule of Hagenberg (a technical university with a strong program in media arts). Some of their students have completed thesis work while interning at the FutureLab, and eventually became employees of the lab themselves.

journals, to presenting their work at industry conferences and establishing strategic partnerships with other artists, researchers, and research programs. Staff has made more concerted efforts of late to increase exposure for its activities on site in Linz. They initiated a symposia series called 'Pixelspaces'[28] at the 2001 Ars Electronica Festival. The idea was to bring together pioneers and active researchers in the field of VR, AR to discuss new theories and prototypes in hardware design and application development. In addition to staging the second Pixelspaces conference during the 2002 Festival, the FutureLab also organized 'Open Lab,' its first official public open house where staff and visiting collaborators presented demos of their latest virtual reality and augmented reality projects.[29]

The FutureLab has been selling its R&D services to external clients ever since it was founded. Staff focused on targeting the private sector in particular for CAVE projects. AEC management made it a habit to give corporations (especially local firms, both prospective and confirmed sponsors) special tours of the Museum, calling particular attention to its VR theater space. The lab's first commercial CAVE project was the 'MCE-Turbine,' a visualization of a turbine for a water power station commissioned by voest-alpine, a large steel manufacturing company based in Linz (1996). That was followed the FutureLab's first large-scale VR project, the 'Siemens Mobile Workshop' (1997). It was also one of the world's first networked CAVE experiments, linking the AEC Museum with the InterCommunication Center (ICC) in Tokyo,[30]

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[28]For an archive of the past two Pixelspaces conferences, see <http://futurelab.aec.at/pixelspaces/>

[29] Some of the most respected AR researchers for special demonstrations and lectures participated in both Pixelspaces 2002 and Open Lab: Adrian David Cheok (National University of Singapore), Professor Hiroshi Kato (Hiroshima City University) and Bruce Thomas (University of South Australia)

[30] The ICC was founded by NTT, a leading Japanese telecommunications firm. The ICC aims "to encourage the dialogue between technology and the arts with a core theme of *communication*." <http://www.nttticc.or.jp/index_e.html>

The ICC's core activities center on staging exhibitions, workshops and public programs related to new media art, as compared with the wider scope of activities of other prominent 'centers of innovation' of the same era, e.g. ZKM and Ars Electronica (See section 1.7 for a comparison).

another museum dedicated to exhibiting technology-based art. (See **Appendix II** for a list of the major CAVE projects the FutureLab has completed to date for industry clients) Hörtner reiterated the reasons for working on corporate VR commissions at the 2001 SIGGRAPH conference in a panel talk called *The CAVE and Beyond: VR Art in Museums and Galleries.*[31]: "In addition to giving the computer art community a place to exhibit and work on production, our objective has consistently been to increase the possibilities for local industry to work with high end VR equipment in order to do application based research in VR, without the immense investment costs."[32]

In addition to projects for the AEC CAVE, the FutureLab has always accepted commissions and undertaken other kinds of collaborative projects with external clients intended for display at off-site locations. These projects have therefore provided a means to gain visibility for Ars Electronica (and, increasingly, the FutureLab itself) outside of the context of the Museum and Festival and, in many cases, beyond Linz city limits. A few off-site examples of projects include: the exhibition design concept and development of two projects for a long-term installation about the future workplace at Zukunftszentrum (arts center) in Innsbruck, Austria (1999); two installations for an exhibition area featured in the London Millennium Dome including the 'Architec Tours' (1999), a special bike that enabled users to take an exciting virtual ride through the worlds of experience at the Dome; and 'unit M' (2000), a permanent installation of a responsive environment that visualizes the business activities and communications at the WIFI, or Austrian Institute for Economic Promotion in Linz.

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[31] In addition to being the major trade show for the computer graphics industry, SIGGRAPH has also long served as a gathering place for new media artists. It is essentially the US counterpart to the Ars Electronica Festival. At the 2001 show, the cited panel brought together a group of pioneering artists and interdisciplinary research lab directors in the VR field including Hoërtner.

Given the scale of human, technical, and financial resources that companies can bring to the table, the FutureLab has increasingly focused even more attention and energy on cultivating corporate partnerships. While it has had easy access to Ars Electronica corporate sponsors like Telekom Austria,[33] the FutureLab's ability to reach out to other companies has depended fundamentally on another partner: the Software Engineering Group in the Department of Business Informatics at Kepler University in Linz, both directed by Professor Gustave Pomberger. Hörtner explained the good fortune of this university connection: "I think without them, we likely wouldn't have been able to develop so fast, especially in establishing ties with new industry clients." Despite the clear expertise of the FutureLab staff, Hörtner added, "In the beginning, it was very important to convince our board of directors and others in the local government about the FutureLab's activities by showing them the endorsement of our very well-respected local university research partners." As a member of the AEC board himself, Pomberger was convinced that "a research lab was the only route to a Museum of the Future." Pomberger and his team began working with the FutureLab soon after the Museum was built, making important introductions and assisting with the handling of contracts and project management.

Like the influence that the ORF and the City of Linz lent to establishing the Festival, Prix, and the Museum, the university has become the third most important strategic partner from the public sector to support the trajectory of AEC operations, primarily via the FutureLab. Pomberger commented, "Within Austria our partnership with the FutureLab is certainly somewhat extraordinary. I do not know whether comparable partnerships exist elsewhere in Europe." Most state research subsidies in Austria are apparently awarded to universities or industry-based research centers. Yet Stocker made it clear that above all else, the partnership with Kepler University was a strategic choice. "For us, it was not illegal to call ourselves a research

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[33] The FutureLab produced two broadband networking projects for Telekom Austria (Teleson and Teleparcel) in the late 1990s.

center without a university connection. Since Professor Pomberger is collaborating with us, we could always refer people to him. [34] This was very important, although we don't need to insist so much any more on this (since the FutureLab is now running fairly smoothly). However, it's still a relationship we want to preserve and extend in terms of credibility and the local situation of being in a small city in a small country." [35] By the same token, it seems that the strategic alliance has presented the university lab with the chance to further enhance its reputation and visibility as an innovator.

Several factors motivated the university to work with the FutureLab. According to Pomberger, he and his team suddenly had "the opportunity to conduct experimental research activities merging art and business" normally restricted from Austrian academic research labs. The FutureLab has likely injected a vital energy of sorts into the comparatively staid academic research environment of its partner. Pomberger also explained that via partnership, the university team could suddenly venture into certain research areas brand new to them, like virtual reality and augmented reality. Student researchers might now be attracted to this university lab over others given the opportunity to get involved in cutting edge research.

One FutureLab researcher commented that, in general, corporations today are working with other research centers, especially university-based labs, "since they can progress more with prototyping by outsourcing as far as bringing interesting new products to market." Corporations

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[34] Professor Pomberger has been director of these research initiatives for 15 years. The size of the staff fluctuates—at its peak between 40 and 60 staff members and currently between 10 and 25 people. A select number of the university researchers work with the FutureLab.

[35] As AEC Gerfried Stocker further explained: "We have a very strong and well-organized network of official research centers in Austria. Two big state-funded independent research centers exist while the rest are connected to universities. Especially when you try to apply for research grants or programs funded by the government, then it's absolutely necessary to be connected to a university, otherwise it would not be allowed if a cultural institution received research funding. That's more strict for official government-funded projects like EU projects."

might be interested in collaborating with the FutureLab via Kepler University since the company essentially gets two for the price of one. The intermediary of the university lab provides a 'safe' way for companies to try out FutureLab services. Both labs are ultimately compatible in their focus on maintaining high standards. Pomberger summarized his pitch to potential clients:[36]

> *The FutureLab is unconventional, innovative and creative, in tune with the times, and a partner that promises a high potential for success...I try to take every opportunity to inform potential partners, regardless of whether they are companies or public institutes, about their capability.*
>
> Gustave Pomberger

Siemens is one of the FutureLab's most important clients managed through Kepler University. The partnership began with the 'Mobile Workshop' VR project (1997), followed by 'HYBREX' (2000), a model of a hot band rolling mill for a virtual environment, for which the FutureLab developed a special presentation for Siemens at a major metallurgy trade fair in Beijing. In the last few years, the FutureLab and the university collaborated on INSTAR, the series of VR and AR projects, the last version of which was exhibited in the 'Hidden Worlds' exhibition at the AEC (2002). The Siemens example is particularly noteworthy. The company's headquarter office in Munich was affiliated early on with the AEC, funding the Prix Ars Electronica competition. Thanks to the FutureLab-Kepler partnership, the AEC has been able to reconnect with Siemens, this time with the R&D division of the company's Austrian subsidiary. The FutureLab therefore benefits from partnership with the university since the divisions of

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[36] Although I focus here on the FutureLab-Kepler projects for corporate clients (since corporate projects constitute the majority of shared collaborations), it is important to acknowledge that Pomberger and team also facilitate access to public sector partners. So far the most significant example is the local government. While the FutureLab already has interaction with the City of Linz via the AEC, it was essential to collaborate with Kepler on the development of a recent project: a special multimedia presentation for mayor's traditional new years address in January 2003 based on the FutureLab's Arsbox presentation platform (See the end of chapter 2 for more on the Arsbox).

companies running technical research projects might not necessarily have found their way to the FutureLab via the AEC.

Siemens is a good example of one of the FutureLab's corporate partners whose resources Hörtner and team have been able to successfully leverage to the client's benefit: "We're now changing our approach with projects like Siemens INSTAR which shows that we can make important advances. He emphasized the potential moving forward: "For example, with the first INSTAR project, our prototype sparked the sponsor's interest. To be clear, what we produced did not add to Siemens' original objective, but it did prove the concept to the point that Siemens was able to take over." The initial work done by the FutureLab eventually convinced Siemens to renew its contract with the lab to do further development on a series of AR prototypes: "One of the most exciting prospects is that the intangible value of our research projects can become tangible." That intangible value involves the evolution of ideas into tangible projects, the brainstorming and prototyping being done from both a hard science and artistic approach.

Any partner can. in turn, leverage the FutureLab's affiliation with a cutting-edge art institution in addition to the combined human resources of research teams from the FutureLab and university. Although the objective might not be set in the beginning of the relationship, partners have the opportunity to display work-in-progress or finished projects at the AEC Museum. In other words, not all projects done by the FutureLab for external clients are automatically exhibited in the Museum. Yet the Siemens INSTAR example highlights the evolution toward that option. Whereas the partnership began as a technical research collaboration, the corporate representatives on the project likely realized the potential to present a prototype within a context that could yield both interesting feedback and a means to advertise the company's inroads in this kind of research to a receptive audience:

> *The FutureLab has an opportunity to do more than, say, a traditional university research lab since communicating this innovation to the public is a key strength and capability of the FutureLab.*
>
> Horst Hörtner

The very fact that that this opportunity exists is arguably an increasingly important selling point.

The potential for negative public reaction increases with the parallel increase in the number of projects for corporate clients that it includes in Ars Electronica exhibitions. In addition to mediating public interaction with a wide range of new technologies shown in both artistic and more commercially oriented projects, the Museum mediates public perception of the FutureLab's activities. Considering the range of projects the FutureLab develops for external clients, it is reasonable to assume that projects for public and nonprofit organizations would likely be favorably reviewed whether exhibited in the AEC Museum or at off-site locations. A company's employees and customers would likely react favorably to corporate-funded projects by the FutureLab, whether exhibited at the sponsoring company's headquarter office or at the Museum. However, the larger public might react negatively to any corporate-funded FutureLab projects exhibited at the AEC Museum since the museum is a nonprofit entity and not a business exposition.

Such controversy about the FutureLab, if it exists, has not been widely reported. This may have to do with the AEC always having been clear in its message to fashion the Museum into a site for displaying a wide range of projects that reflect technology change. On the other hand, the potential for controversy should be something AEC management keeps in mind as the FutureLab increases the scope of its collaborations with corporate clients. In all likelihood, the number of projects like INSTAR included in future exhibitions will increase.

When it comes to mixing art and commerce, the institutional boundaries for both a cultural organization and a corporate entity are extremely socially codified. However, in the Ars

Electronica example, the nuances of interaction between nonprofit and for-profit institutions become apparent. Considering the range of interactions between corporations and the various divisions of the AEC, corporate submissions in the Prix Ars Electronica competition have been the most controversial to date. Since it is marketed as an arts-focused event within a Festival that historically has championed the work of new media artists, people tend to have a clear 'black or white' feeling about the kind of work that legitimately qualifies for competition. The AEC Museum, on the other hand, is promoted as a venue for public interaction with new technologies more broadly.

This issue of corporate sponsorship will be discussed in more detail in chapter three. The main idea to focus on here is that the FutureLab believes strongly in the basic cultural mission of Ars Electronica and works hard to maintain both its own credibility and that of its parent institution by balancing artistic and more commercially oriented projects. It did not take long for the FutureLab to evolve from a small in-house development shop into a distinct and vital entity of the AEC. The strong institutional context has facilitated and sustained the FutureLab's growth. The attitude of the current FutureLab staff toward 'art' and 'technology' represents the maturing of the original Ars Electronica mission to bring together artists and scientists to engage in a mutual exchange.

1.6 A Precedent for Interdisciplinary Research

Novelist and scientist C.P. Snow famously pointed out in his essay "Two Cultures" (1959) that the term 'scientist' was originally analogous to 'artist.' The false divide between the sciences and the humanities occurred by fate of history. In a second essay, he stated the hope that one day an undetermined new 'third culture' should fulfill this intermediary role. It is useful to consider the various interdisciplinary research programs that began to emerge not long after Snow's predictions as fulfilling such a role. Artists were largely the catalysts to such programs.

The so-called "art-technology movement" developed during the latter half of the 20th century. It was a movement in terms of artists' "change in attitude" toward technology and science, rather than in the stylistic sense that had shaped earlier techno-friendly artist movements at the beginning of the century, from the Futurists to the Bauhaus and Russian Constructivists. Television had already begun to transform the social space. Electronic media gradually became more than just tools governed by a few to "control" the masses (Bijveot 1997: 17-20). A 'who's who' list of artists of the post-war era—from Paik to Warhol—consciously appropriated the tools of media production that were becoming more accessible to the average consumer. Their intention was to explore for themselves the possibilities for radical change in society being triggered by new technologies. [37]

Media scholar and iconoclast Marshall McLuhan once vividly described the social consequences of electronic media in drastic terms, proposing artist intervention at that moment in the mid 1960s as a vital act of public salvation: "The new media and technologies by which we amplify ourselves constitute a huge collective surgery carried out on the social body with complete disregard for antiseptics. The artist can correct the sense ratios before the blow of new technology has numbed conscious procedures" (1964b: 64). In an earlier work, McLuhan's tone was less dystopian and, perhaps, more representative of the attitude shared by early artists-cum-techno-enthusiasts. "Technological environments are not merely passive containers of people but are active processes that reshape people and other technologies alike" (1962a: 78).

During the 1960s and 1970s, organized interdisciplinary research initiatives began to take shape in order to facilitate collaboration between artists and scientists. Media scholar Michael Century proposed the term *studio-lab* to describe such initiatives. He carefully mapped out the

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[37] For a lively historical account of the impact of technology on modern art making practices, see Margot Lovejoy's *Postmodern currents: Art and Artists in the Age of Electronic Media* (1997).

different phases of evolution of studio-labs (1999b). To cite just some examples, the landmark programs in the first phase were those led by charismatic visionaries who believed that "the social function of art inextricably incorporates new telecommunications and computer technologies" (Gute 1998). Founded in 1966 by visionary Bell Labs engineer Billy Klüver, the short-lived but legendary group Experiments in Art and Technology (EAT) was a clearinghouse for visual and performing artists in the New York area (some of the most influential of that era) interested in working directly with engineers to experiment with new technologies like sound transmitters and other electronics. The group's manifesto called for the collaboration between parties evolving "unrealistically in isolation." EAT's crowning achievement was a project it developed with Pepsico—a gigantic pavilion full of interactive art works for the 1970 world exhibition in Osaka.[38]

EAT was an important precursor to institutionally based studio-labs of the same phase. In 1967, Bauhaus-trained artist Gyorgy Kepes founded the Center for Advanced Visual Studies (CAVS) at the Massachusetts Institute of Technology (MIT) in Boston. By situating the lab within a major technical university, Kepes aimed to shepherd what he considered to be vital synergies:

> *So far, we have failed to live up to the twentieth-century challenge. Science has opened immense new vistas to us, but we have failed to utilize our new technology fully or to share it wisely.*
>
> Gyorgy Kepes[39]

CAVS researchers pioneered the use of lasers, plasma sculptures, and holography as tools of expression in public and environmental art. CAVS has a few visiting fellows today and the scope

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[38] For a full account of the Expo 70 project by EAT, see *Pavilion* (Klüver, Martin, Rose ed. 1972)

[39] *Structures in Art and Science* (Kepes a 1956: 1)

of the program has been drastically reduced. The Institut de Recherche et Coordination Acoustique/Musique (IRCAM), a large computer music research and production institute, was established in 1977 in Paris by avant-garde composer Pierre Boulez. As a state-funded division of the Centre Georges Pompidou contemporary arts center, IRCAM pioneered research into computer music. It continues to thrive today, having just celebrated its 25th anniversary.[40]

Both ZKM (Center for Art and Media) in Karlsruhe, Germany and Ars Electronica exemplify the evolution of studio-labs into the 1980s and 1990s. With current chairman Peter Weibel[41] as counterpart to Ars visionary Leopoldseder, both were instrumental in pioneering the idea of a cultural institution as a 'center of innovation' that presents an ambitious scope of activities. In addition to staging exhibitions and events (combining a public education mandate with the most future-oriented new media art experimentation, each institution has developed significant production and research programs (although the mission and scope of activities are much more structured at the FutureLab compared to ZKM's more recently established research programs).[42] Both began as festivals (the Multimediale festival was staged in Karlsruhe from

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[40] The legacy of EAT continues to generate significant interest today. The ICC new media arts center in Tokyo mounted an EAT exhibition from April-June 2003. The Daniel Langlois Foundation in Canada houses a collection of over 500 documents about EAT activities from 1965 to 1981. The comprehensive EAT archives are kept at the Getty Research Institute in Los Angeles.

[41] Before coming to ZKM, Weibel directed the New Media Institute in Frankfurt and, prior to that, he worked at Ars Electronica. He was instrumental in orchestrating the philosophic and artistic realignment of the Ars Electronica Festival in 1986-87, which led to the establishment of the Prix Ars Electronica Festival in 1987.

[42] The AEC and ZKM have the best-equipped museums in the world able to deal with issues particular to new media art, including: exhibition management (providing appropriate infrastructure and technical support), preservation (creating effective methods for archiving) and collection management (finding a market for digital art). Institutional support of new media art has been a popular topic of conversation in the last several years among cultural policy makers, museum and festival directors and curators, and artists/artist networks. For further related reading: *New Media Arts/New Funding Models* (Jennings 1999); "Museums of the Future: The Impact of Technology on Museum Practices" in Daedalus (Anderson 1999); *From Celluloid to Cyberspace: The Media Arts and the Changing Arts World* (McCarthy/Ondaatje 2002).

A handful of pioneering exhibitions were staged at major US museums in the 1960s and 1970s featuring artwork created with new technologies (curated by Jack Burnham, Jasia Reinhardt, and Gyorgy Kepes to

1989 through 1997). Compared to the AEC, ZKM has a wider range of specialized divisions and institutes, making it the largest media arts institution in the world.[43]

The MIT Media Lab, established in 1985, best represents a third phase of studio-lab development. Nicholas Negroponte, the founder, is known for shaping an unprecedented model for unrestricted corporate-sponsored research. Former principal researcher Alan Kay's dictum "the best way to predict the future is to invent it" has characterized the Lab's research approach, as immortalized in an early promotional piece cum ethnography by Stewart Brand (1987). The Media Lab has been able to convince corporations with deep pockets that it holds the keys to the next new thing and can also carefully manage the licensing of intellectual property to sponsors. The Media Lab is widely regarded as the gold standard in interdisciplinary research given the resources and circumstances it has been able to leverage, including its position within a world-renowned technical university. However, today the Lab is going through a period of flux, some say crisis.[44] Given the current depressed state of the economy, it has been unable to pull in the

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name a few). Today, many American museums are slowly but surely trying to propose solutions to retrofitting the infrastructure of the "white box" (e.g. Whitney Museum, NYC), while others are committing major resources to building new additions that support new media art (e.g. Walker Art Center, Minneapolis although the fate of the Walker project seems to be up in the air since it closed down its media arts department as of early May 2003). A few museums dedicated exclusively to new media art are finally emerging, yet not yet very visible (e.g. Beecher Center, Ohio) or still in the slow process of building a new museum (e.g. Eyebeam Atelier, NYC)

An interesting subject for another study involves the reasons Europe has taken the lead in pioneering the wired museum despite the fact that technology development has been driven largely by US companies. In the anthology *New Media Reader* (2003) media scholar Lev Manovich points to a simple reason that Europeans have been able to observe the technology revolution in the US, allowing more time for reflection on the best ways to assimilate new media.

[43] The original divisions of ZKM include (1) the Museum for Contemporary Art, (2) the Media Museum, (3) the Institute for Visual Media, (4) Institute for Music and Acoustics. Three relatively new departments include (5) the Institute for Basic Research, (6) the Institute for Net Development, and (7) the Institute for Media and Economics

[44] Longtime Media Lab supporter *Wired* magazine recently published an article "The Lab that Fell to Earth" (May 11, 2003) that makes the drastic prediction that it is "on brink of breakup or, even worse, irrelevance" because it was unable to sustain sponsor interest in a vague research mission. Around the same time, the *Boston Globe*'s article "Reinventing the Media Lab" (April 7, 2003) provided a different

same level of industry support and its recently established European and Asian ventures are struggling.[45] In reviewing its history to date, it is important to emphasize that the Media Lab has legitimized the value of its creative research model to a whole generation of corporate decision makers.

In addition to university-based labs and interdisciplinary cultural institutions, industry-based studio-labs like Xerox PARC (Palo Alto Research Center) and Interval, founded in 1970 and 1992 respectively, are noteworthy both for their pioneering efforts to create a framework for artist-in-residence programs within a corporate setting and also for lessons learned about intellectual property (IP) management. The two Silicon Valley labs book end an era of unprecedented technology development from the PC to the dot.com revolutions. Xerox PARC is known for the most famous IP debacle of the Information Age—the would-be Apple and

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interpretation of the state of affairs. Media Lab academic chair William Mitchell is quoted as saying, "(Our mission) has to do, always, with emerging technologies, and the way that they relate to people's daily lives.... "If we ever settle on a truly static definition of media arts, then we'll really be dead." The current situation is par for the course given the unpredictable nature of technological change. The Media Lab's investment in technology research is fundamentally risk-taking and exactly what has made the undertaking so vital for the last two decades.

[45] In a recent interview, MIT Media Lab principle researcher Glorianna Davenport explained that all Media Lab efforts abroad in a relationship with MIT are currently independent entities with contractual single or multi year relationships with MIT. Media Lab Europe (MLE) was established in 2000 while Media Lab Asia (MLA) in Mumbai, India in 2001. Both offshoots have received a sizeable proportion of seed funding from the public sector. The research mandate differs between the two.

With the MLE, there were two pieces to the original contract: first, the establishment of the legal entity (this happened very quickly); second, a 10 year research contract with Media Lab in the US. The decision by the Irish Government to step up to the plate and establish MLE was based on a fiscal model that included a steady growth in private sector funding. The idea for MLE was to adopt many aspects of the Media Lab model in the US. Davenport commented, "We thought we could recreate a similar culture, but we discovered that this was exceptionally difficult, especially because the Dublin lab is not situated on a large university campus. Rather it is located in an old building at the center of the Guinness Brewery, with access to a major street but still a 15-20 minute walk from a university campus."

With MLA was formed as a collaboration between the IIT's (technical universities/schools). From the beginning it was designed as a distributed laboratory, largely focused on the development of distributed technologies that could positively affect rural (poorer) communities. According to Davenport, MLA was funded by the government, initially with the idea that the industrial sector would step up to the plate. However, in the unstable economic climate, less industrial activity resulted than initially anticipated. This was aggravated by a change in the Indian government which just recently decided to assume full responsibility for the MLA, causing MIT to exit the situation.

Microsoft founders "stealing" innovations from PARC, namely the idea behind the PC graphic user interface.[46] Xerox PARC was able to foster an environment for resident artists to engage in open-ended exploration of ideas, initially without providing a clear plan on possible marketplace opportunities. Learning from PARC, Interval tried to be smarter about IP. Yet despite huge investment by ex-Microsoft billionaire Paul Allen, the lab folded. Some say it happened because the founder was focused on bringing inventions to marketplace while at the same time demanded too high a price for licensing the patents of Interval inventions, which ultimately stymied many spin-off deals.[47]

Considering these few outstanding examples, several points should be emphasized about interdisciplinary research. First of all, if carefully shepherded, the ambitious vision to imagine the future is exactly what inspires interesting dialogue, which in turn can result in important research and developments. The basic premise of interdisciplinary research has always been that both artists and researchers are innovative and entrepreneurial. With technology as their common language, together they can pool resources to push its potential. As a rule, artists bring their resourcefulness and creativity to the table while researchers bring their skills in solving problems in an efficient, systematic manner. The ultimate goal is to generate a range of outcomes, from social/cultural value to commercial value (See **Figure 3**).

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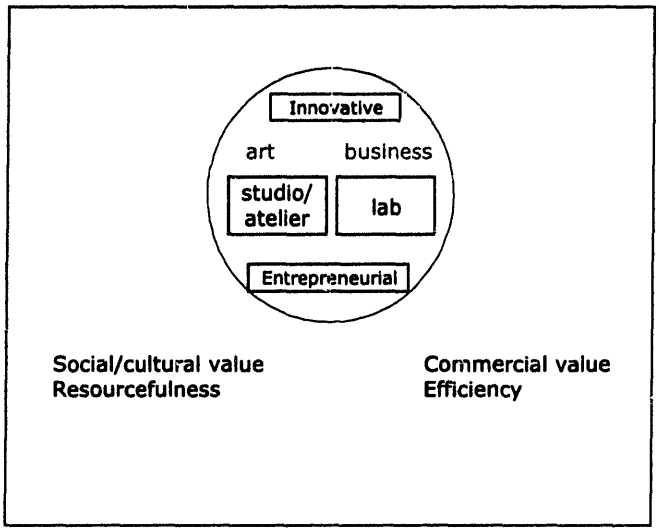
[46] *Art & Innovation* (Harris ed. 1999) by PARC veterans give that story their own twist.

[47] From an interview with former Interval employee and media artist-researcher Michael Naimark (January 2003): " Interval was a small vital community of creative people who were exploring weird esoteric ideas in arts and sciences. We felt responsibility to bring ideas through to either patent or publication, which was always an executive committee decision. Closure was intended either way. So, a social contract was part of the plan, to cooperate fully if and when these ideas were to be commercially developed. Most business people would say that the potential value of your baton increases the more you take it to the marketplace. I observed that the more entrepreneurial Interval became, the less interesting it became from a research and esoteric perspective."

Figure 3: The R&D Process



Interdisciplinary research models are best evaluated vis-à-vis the particular institutional framework that supports hybrid collaboration. In each of the aforementioned studio-labs, collaborators have had a differing degree of success in harnessing human, technical and financial resources available within their institutional setting and defining a strategy for creating social and/or commercial value as they see fit. The university environment is set up to be a place for open experimentation wherein the creation of social and commercial value can be equally legitimate pursuits. The MIT Media Lab, for instance, had a business plan to attract lucrative external support for its research program. It also gained more significant internal support from the Institute than its predecessor, CAVS. Nevertheless, the Media Lab has been in as state of flux since its research model has depended primarily on the market. While concentrating on commercial goals has been feasible (i.e. producing inventions that can eventually generate market value for corporate sponsors), the Lab has also been developing more fully an arts focus. Plans for a new facility, the Center for the Arts and Invention, were announced by MIT in Fall 2002.[48]

[48] See Matt Mirapaul's article "Concrete Dreams: Actual Museums to Hold Virtual Art" New York Times, October 26, 2002.

Fiscal problems have put these plans on hold. However, at the same time, others feel increasing a focus on hard science is the way the Media Lab should reshape its activities since that might more likely reinvigorate corporate sponsorship.

The situation is completely different for nonprofit cultural institutions whose basic mission is, generally speaking, to create social/cultural value. The AEC, IRCAM and ZKM have benefited from significant public funding to sustain their activities. Yet in the preface to a catalogue published in conjunction with the 1997 opening of ZKM, co-founder Hans Peter Schwartz highlighted the importance of the center's fundamental connections to industry:

> *New media technologies, which are in the process of becoming the dominating economic and political force as we head into the 21st century, are suddenly revealing the important role which art and artists could play in designing the new content and reception forms without which their media merchandise would be of no market value.*
>
> Hans Peter Schwartz

In the spirit of EAT, both the AEC and ZKM have generally been open to corporate partnership since technology development is driven by the private sector.[49] In a sense both are in the business of actually creating pressures for themselves. They are consciously testing the boundaries of what it means to be a cultural institution at the dawn of the 21st century, challenging the notion of set artistic agendas and clear boundaries between the private and nonprofit sectors.

Models of artists-researcher collaborations have reached a point of maturity in an economic environment driven increasingly by so-called *creative industries.*[50] Economist Richard

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[49] Michael Naimark points out that in the case of ZKM, the institution has explicitly shied away from the Media Lab approach to corporate sponsorship: "the ZKM is rather based on what the Media Lab didn't become," i.e. a hybrid version of the Media Lab and CAVS (which was a once planned merger): <http://www.naimark.net/writing/trips/zkmopenstrip.html>

[50] The concept of creative industries was developed in the mid 1980s, pioneered by the UK government, following an assessment of the significant social and economic impact generated by a growing labor force devoted to creative work. Creative industries can be defined as 'activities which have their origin in

Florida explained that creativity has become an important economic measure in part because "new technologies, new industries, new wealth and all other good economic things flow from it.... The creative process is social, not just individual, and thus forms of organization are necessary" (2002: 4). It follows that institutional support of creative collaboration is becoming increasingly important. The creative industry sector is the fastest growing industrial sector by far all over Europe, as well as the one that seems to provide the key for local and regional growth by attracting people to areas of creative energy (Tweedy 2002: 14).

Despite the evolution of the creative economy, skeptics still suggest that the media center mania of recent decades seems more like a fad than anything. Some are wary of the potential exploitation of artists, co-opted for commercial endeavors.[51] However, policy makers in the last several years in the US and Europe have attempted to address this and other potential problems in interdisciplinary research environments. Although there are no turnkey solutions given the diversity of institutional settings, these initiatives call for the establishment of some best practices. By the time this paper was completed, media artist-researcher Michael Naimark published an important study commissioned by Leonardo together with the Rockefeller Foundation[52] about the feasibility of a hybrid art center and research lab structure to be financially sustainable based on a comprehensive mapping of institutions around the world, including Ars Electronica and the FutureLab). Around the same time, the Computer Science and

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individual creativity, skill and talent and which have the potential for wealth and job creation through the generation and exploitation of intellectual property' (Hartley/Cunningham 2002). The creative class includes people in science and engineering, architecture and design, education, arts, music and entertainment, whose economic function is to create new ideas, new technology and/or new creative content. <http://www.culture.gov.uk/creative/>

[51] Century references this concern by critic Roetzer in "New Media Culture" in Europe (1999).

[52]Naimark's ArsLab report is available at <http://www.artslab.net>. Leonardo/ISAST (affiliated with MIT Press) promotes the work of artists involved in contemporary science and technology and seeks to stimulate innovative work between artists, scientists and engineers: <http://www.leonardo.info> The Creativity & Culture program of the Rockefeller Foundation, a US-based global organization, "fosters exploration of the emerging relationship between art and new digital media." In addition to support for the ArtsLab report, over the last few years, it has commissioned 3 other major studies under this program, including Michael Century's "Pathways to Innovation": < http://www.rockfound.org>

Telecommunications Board (CSTB) of the US National Academy of Science[53] also published "Beyond Productivity: Information Technology, Innovation and Creativity," a comprehensive study suggesting ways to create and sustain the most conducive environments for IT-arts exchange.

Policy initiatives to support interdisciplinary research have also been driven at the European Union (EU) level.[54] At a meeting in Prague in 1996, the Council of Europe[55] helped media arts institutions kick-start an initial brainstorming session based on the theme 'New Technologies: Cultural Co-operation and Communication.' According to Andreas Broeckmann, artistic director of Berlin-based new media arts festival 'transmediale,' he and other institutional representatives forming this European Cultural Backbone (ECB) were able to finally break significant ground on some of the ideas formulated at the Prague conference the following year at a meeting organized by the Dutch Virtual Platform. Dubbed 'P2P' (From Practice to Policy), participants discussed the need for co-operation between different sectors of society managing media change.

When Austria held the EU Presidency, it organized a working group on 'Cultures of Electronic Networks' at the 'Cultural Competence Conference' in Linz in October 1998. A document presented an outline of the group's objectives: "Cultural activity in digital media is driving innovation at all levels, with a constant movement of skills, ideas, individuals and

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[53] CSTB began examining opportunities at the intersection of computing in the humanities and the arts in the mid-1990s. The committee piloting the study cited here is chaired by the acting academic head of the MIT Media Lab, William Mitchell. CSTB board members include representatives from academia and industry. < http://www7.nationalacademies.org/cstb/>

[54] Austrian cultural policy is discussed in a bit more detail in Chapter 3. Also, see Appendix III for a summary of useful links, which includes key cultural policy making bodies.

[55] The Council of Europe is the oldest of the institutions set up after WWII to work for greater unity between the peoples of Europe. In addition to the Council of Europe, the other multi-lateral policy-making bodies within the EU are: European, Commission, UNESCO, the World Bank, and the European Committee for Arts and Business Partnerships (CEREC). (Handbook on European Cultural Affairs 2000)

infrastructures across different sectors. Innovative market activity can only be upheld insofar as the 'non-profit' creative research it depends on is fostered on a permanent, continuous basis, and sufficient fluidity is encouraged between the commercial and 'non-profit' sectors."[56]

One outcome of these initiatives was the publication in 1999 of "Digital Culture in Europe," an inventory of good-practice models for centers of innovation in the arts and technologies. Beyond that, Broeckmann said that RADICAL (Research Agendas Developed in Creative Arts Labs) was one of the "most practical results of the P2P/ECB networking process."[57] Established in 2000 within the context of the EU 5th Framework 'Information Society Technologies Programme,'[58] the RADICAL mandate was to explore the practical side of tools creation and establish a set of good practice guidelines for work in interdisciplinary research labs.

As a site for exploring the interface between art and technology, the FutureLab was a natural outgrowth of the original mission of Ars Electronica founders. Although there are several labs in the US, Europe, and Asia dealing with the same issues either in an artistic context or an industrial context, Hörtner explained, "We do not really compete with these labs—rather we all co-exist in a network." In terms of other organizations in Europe, like ZKM, C3 (Center for Culture and Communication in Budapest), and V2 (Institute for the Unstable Media in Rotterdam) only one part of each of those institutions is really comparable to the activities of the

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[56]This report, 'Cultural Competence Conference' in Linz, was posted on the website of the European Cultural Backbone (EBN). The EBN was established in 1998 by the Austrian Federal Chancellery (Department for the Arts), also during the Presidency of the Austrian Presidency of the EU. Its mission is to develop a joint approach between European media culture institutions regarding issues of cultural participation in electronic networks and the preservation of the public domain in the Information Society. <http://www.e-c-b.net/ecb/about/articles/992926017>

[57] Comments from an email interview with Broeckmann (May 2003)

[58] Each framework setting the priorities for the EU's research, technological development activities. The 5th Framework lasted from 1998-2002. The initial meeting of RADICAL was held in Paris at the Inter-Society for Electronic Arts (ISEA) conference in December 2000: <http://www.cl.cam.ac.uk/CODE/events/radical.html>

FutureLab.[59] "So in other words, there is no institution in our peer network that compares specifically (as a mirror image) to the complete set of particular areas of expertise of the FutureLab." This is largely due to the particular institutional framework that supports the FutureLab's activities.

Some recent comments from FutureLab staff members summarize the general attitude toward their current working situation:

> *There is a nice flow between the Museum and the FutureLab. It has been that way since the beginning and there is no real attempt to make the two places independent from one another.*

> *This exchange is very important for both the Museum and the FutureLab since our projects help promote the innovative image of the institution.*

At the same, the team has some concerns about the research model and the funding structure, which will be discussed in the next two chapters.

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[59] The AEC, ZKM, C3 and V2 are all members of *EncART* (European Network for Cyberart), a collaboration platform established in 1997 to foster development and presentations of high bandwidth networked media art projects, technical knowledge exchange and interdisciplinary research and development in the field of the arts: <http://www.encart.net/>

Chapter 2

On a Hybrid Research Model

"Organized chaos"—this is the way one employee summarized the FutureLab's working process. The key to the lab's growth and success has been the way staff members deliberately molded a deliberately flexible research model (See **Figure 4**). It is a hybrid model in several senses and the features can be mapped out as follows: First, the *work environment* merges an artistic focus (which comes from being part of a cultural institution) with a scientific focus (through affiliation with a traditional applied research center). This attracted a talented staff seeking just such a dual focus. Second, staff has attempted to sustain a largely non-hierarchical *organizational structure* while at the same time introducing management changes in order to better deal with an increasing workload. Third, their *basic research approach* is characterized by a mix of an artist's spirit of open-ended exploration of ideas with business world professionalism and pragmatism to produce projects that are both cutting-edge and robust. Finally, staff focuses on *technology development* through a process that combines a mastery of available technologies in its three core research areas (virtual environments, interactive installations, digital surfaces) with a strong focus on developing new tools, custom applications and platforms, a.k.a. "in-house technology developments."

By closely reviewing interviews with staff, it becomes clear that they are motivated to clock long hours in order to maintain this research model given the opportunities it affords them. As a result of intensive work cycles, the FutureLab has produced an extensive portfolio of projects and in-house developments, including the 'Arsbox,' a PC-based version of the CAVE virtual reality theater. However, staff is aware that the increasing workload—especially on a new suite of Arsbox commissions—is launching the FutureLab into an important next phase of its

Figure 4: FutureLab Hybrid Research Model

Work Environment	
Balance between ...	*and ...*
artistic focus, as part of a cultural institution, the Ars Electronica Center (Museum and Festival) *Result: Functions as permanent venue for exhibition of lab projects; Access to state-of-the-art equipment, as well as to the network of participants in Ars Electronica Festival, AEC sponsors, and more generally, international new media art community.*	scientific focus, as part of an applied research lab, reinforced by affiliation with the Software Engineering Group/Department of Business Informatics (Kepler University) *Result: The FutureLab acts as an extension of the university lab and vice versa, each one reinforcing the other's activities.*
Organizational Structure	
Balance between .	*. and ..*
non-hierarchical structure overall with the feel of a start-up company, operating through constantly changing temporary hierarchies (i.e. "Fishnet" model) *Goal: To allow for changing project teams; To foster a team spirit and sense of equality*	small internal management team (mini-hierarchy) to support the director, including "key researchers" who oversee the activities of the three main research areas *Goal: To ensure productivity and efficiency ("a better work flow")*
Basic Research Approach	
Balance between ...	***... and ...***
artist's spirit of open-ended exploration of ideas *Goal: To promote creativity and encourage constant learning/skill-building.*	business world pragmatism & professionalism *Goal. To solve tough research problems, propose reliable solutions, and produce high-quality content/products at market pace.*
Technology Development	
Balance between ...	***... and ...***
a strong focus on developing new tools/applications/platforms, a.k.a. "in-house technology developments" *Goal: To encourage constant learning; To push available tools into new directions in order to develop more robust, customizable and affordable products and solutions, e.g. "Low-cost VR" systems.*	a mastery of commercially-available technology tools/applications/platforms *Goal: To imagine the aesthetic applications of existing technology tools.*

history and also threatens to upset the delicate balance of its research model. Although some managerial restructuring recently occurred in order to deal with the situation, staff members perceive the need for further organizational changes. A look at the basic features of the research model reveals the most critical organizational issues that need to be addressed.

- How do the features of the FutureLab's research model sustain the its activities?
- What is the significance of the Arsbox? What are the benefits and consequences of the FutureLab's research model, as exemplified by the Arsbox?
- What concerns do FutureLab staff and AEC management have as the lab faces an increasingly heavier project load?

2.1 Work Environment

Young and ambitious people joined the FutureLab team for various reasons related to the work environment. For some, the draw was specifically the lab's position within Ars Electronica, a dynamic cultural institution: "I was always fascinated by the way the AEC paired its technology focus with a larger cultural mission." Another person remarked:

> *A few of us first worked as Infotrainers (i.e. tour guides) at the AEC Museum because it was one of the most exciting jobs around. Then we found out exactly what was going on at the FutureLab and found out we could be involved with two really interesting places.*
>
> Yvonne Hauser

For others, finding the FutureLab was an act of fate given their career interests. Considering the relatively small size of the Austrian new media arts scene, Ars Electronica was a natural choice: "When I was doing my thesis work, the only place in Austria to access the CAVE was at the AEC. So I started working here to know more about it." A few were interested in completely changing their career path: "I was doing very theoretical and mathematical research at a large non-academic lab and wanted to do something totally different." "I was working in industry

beforehand and it was always the same routine, which became a problem. By coming to the FutureLab, I faced a huge learning curve."

The FutureLab emphasizes that it is very serious about maintaining a scientific focus as a complement to an artistic focus. It is able to do this through a partnership with the Kepler University Software Engineering Group in Linz. Therefore, the FutureLab was also an interesting alternative for those people tempted by a career as a researcher. In Austria, "You can only work in a university lab if you're doing a PhD. And even then you're limited to working 20 hours per week as a research assistant with a low monthly salary." "There are no tenured positions in Austrian research labs. A new law was established here that says that a professor can only teach for 5 years, before having to reapply for a position. And even then, there's no guarantee to be able to continue in that position." The FutureLab acts as an extension of the university lab and vice versa, each one reinforcing the others' activities. Researchers in either lab get the best of both worlds through the FutureLab-Kepler partnership.

Overall, the major draw for employees was the energy of the FutureLab environment: "I was working part-time here in the beginning. Then I left town to judge a European multimedia award competition in Salzburg, but I returned to Linz because a lot more exciting stuff was going on here." "I did some project work for an Ars Electronica exhibition at a local gallery that caught the lab director's attention. Then when I saw their work, I knew the guys there must be real gods!"

Once onboard, several factors have sustained the team's enthusiasm for their general work environment. As primary contributors to the annual Festival, employees are in a unique position to interact with the network of Ars Electronica participants and supporters, especially the international new media art community: "I really appreciate the flow of people coming into the lab—the different people from different nations, especially during the Festival. They are kind of

an inspiration for me because it's interesting to try to find out how other people work and think." A steady stream of visitors, from potential collaborators (artists, researchers, clients) and VIPs (corporate executives, public officials) to school groups (namely university students), also comes to the Museum year round, and AEC management makes it a point to showcase the FutureLab whenever possible. Lab staff also builds up a strong rapport with visiting artists and research associates:

> *Thanks to our situation within Ars Electronica, we always have external collaborators who help breathe new life into projects and who we can learn from to gain different perspectives.*
>
> Erwin Reitböck

Golan Levin, a current FutureLab artist-in-residence who has also worked at the MIT Media Lab and Interval Research, summarized the importance of these various connections: "Research labs need external blood, otherwise they get stale." At the FutureLab, people have plenty of opportunity to constantly recharge themselves. It is noteworthy, as Levin and others have confirmed, that the same phenomenon happens in reverse to visiting artists and researchers. The unique surroundings and activities in Linz are stimulating to the point that "time flies too fast and it is hard to leave."

Their *studio-lab* is spread across two main locations, the AEC Museum and the FutureLab facility. Between the two sites, lab staff has the opportunity to move between the two in order to stimulate creativity and productivity. The Museum is always accessible and serves as an extension of an artist's studio, the CAVE virtual reality theater in particular being a space where staff is engaged in constant experimentation with new content. The Museum functions like an artist's open-studio (an event when an artists opens up the studio to display work-in-progress). It also offers a guaranteed permanent venue for the exhibition of staff projects, which is certainly a rare situation for any artist, let alone a software engineer: "One of the great pluses is that with

the annual Festival, we always have the possibility to showcase ourselves in really interesting surroundings."

The lab itself is a comfortable facility with most desks gathered into one large space. It is designed to facilitate conversation but also can be divided in half if the programmers and the designers feel like separating themselves. When I did my field research, I got an impression of the team's sense of pride and ownership for the lab. This is understandable since they tend to spend a lot of time in the office given the project load. The team treats the lab as a second home: "Everyone has responsibility for some part of the lab, from equipment maintenance to security control."

2.2 Organizational Structure

The organizational structure at the FutureLab resembles that of a start-up company. Management is determined to maintain a fairly loose framework in order to foster a sense of equality among employees. At the same time, it aims to provide a minimum amount of structure in order to maximize efficiency and productivity. Ultimately, all management change happens for the greater good. Since everyone is expected to work long hours, every effort is made to promote a team spirit and empower employees to take charge in project direction. The roles of the staff are not rigidly defined and management does not insist on job titles in the daily routine.

Equality is emphasized in the democratic approach to the conceptualization phase of any new project: "Everyone's voice really counts and everyone can, and does, participate. The strategy is that, since we encourage everyone to be involved in the creation of ideas, then everyone is more motivated to work." "We really care about brainstorming sessions. No one kills another's idea because if we can't use it now, then there's always the possibility to revisit it later." One of the major positive results of this approach is that:

Everyone here is treated with the same amount of creativity. So it doesn't matter if it's a software engineer who came up with a design idea.

Christopher Lindinger

Another way the FutureLab's organizational structure encourages a good working dynamic is through its focus on forming diverse project teams. For one, this is meant to ensure that projects resonate with a wide audience. The tech-savviness of a FutureLab employee extends beyond that of the average Museum visitor. "It is especially important to work on exhibition development with people who have different perspectives (e.g. people with more technical knowledge mixed with say those on the team who are designers by training) because we need to try to cater to a broad audience, not only those with a privileged background and familiarity with technology." A second reason for varying team formations is to keep things interesting for everyone. This system is an internal mechanism to avoid becoming stale, in addition to the external stimulation from the constant flow of new collaborators and visitors:

The lab uses a kind of modified pit crew approach to forming project teams: "On any given project, we designate a project leader or leaders. A team forms around that person or persons. Then the team dissipates once a project is completed." This approach has been described more systematically in a paper published by the Institute of the Future (IFF) in Silicon Valley. The Institute outlined the rise of the 'Fishnet Organization'[60] during the dot.com era, exactly when the FutureLab was created. In the fishnet organization, there is a shift in focus from 'economies of scale' to 'economies of structure.'[61] Picture a fishnet lying on a dock. It can be

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[60] "Fishnet Organizations" from a project report produced for the Institute for the Future's Corporate Associates Program, *21st Century Organizations: Reconciling Control and Empowerment* (1995)

[61] Economies of scale refer to operational efficiencies. As production increases, the cost of producing each additional unit decreases.

pulled up at any point and at that peak a temporary hierarchy forms: "The freedom of this structure requires people to seek out others to make things work" (IFF 1995: 30).

Indeed, the smooth functioning of the FutureLab depends on the staff members' independent initiative and ability to make smart decisions in their work. Security in the fishnet is defined by the other organizations that help buoy up the web. In the FutureLab's case, that means first and foremost the AEC and also the university, followed by its various external clients. Some of the challenges of this organizational approach include:

- Managing flexibility (since the rules are loose, there needs to be some attention to maintaining a certain amount of discipline)
- Moving beyond immediacy (fishnet organizations thrive in the short-term but also need to be sure to plot long-term plans and objectives)
- Maintaining continuity (success depends on a commitment to continuous learning and an attention to quality)
- Keeping a handle on the big picture (success depends on understanding and maneuvering the dynamics across the totality of the fishnet)

In order to address these challenges, the FutureLab initiated a staff reorganization in 2001. It decided to implement a semi-structured management system. First of all, the roles of the permanent front-of-house manager and the person dealing with 'content management' were better defined so that both now are more empowered to handle external communications. The latter is the lab's primary spokesperson who assumes much of the responsibility for promoting the lab to the outside world. This includes working with lab staff and visiting associates on project concept elaboration as well as with AEC management on FutureLab promotional materials, VIP visits, etc.

A second significant change came with the appointment of three so-called 'key researchers.' All employees had previously reported directly to lab director Hörtner. In an attempt to finally alleviate him from being on call 24/7 and redistribute some of his responsibilities, the

team was divided up into groups mirroring the lab's three main research areas (virtual environments, interactive installations, digital surfaces), each one headed up by a key researcher. Everyone now reports to one of these three people who have, therefore, acquired a certain amount of power. Yet the ultimate goal of setting up this mini-hierarchy was to "get a better work flow." For the key researchers, the primary benefit is the opportunity to gain more experience in higher-level management and administrative duties. It did not necessarily translate into a promotion, e.g. higher salary, which might have been expected in a corporate or academic environment.

In this newer organizational structure, each employee is officially assigned to one of the three research areas. However, that was mainly intended as a practical way to present the team's capabilities to the outside world. No one focuses exclusively on any research topic. Given the large number of projects underway at any given time and the relatively limited human resources, it is actually important for team members to have familiarity in all three areas.

Opinions differ on the management changes. Some do not sense any drastic difference:

> *We have a self-running organizational process that has been tweaked a bit over time, but generally it's the same approach now that we had from the beginning.*
>
> Dietmar Offenhuber

Yet Hörtner acknowledged that, "not everyone is completely happy with this new system with the key researchers." Several people prefer the old system when there was a loose, unofficial organizational structure. There is a fear that the new system sets a precedent for other management changes in the near future, which could hinder the essential organic workflow:

> *Any attempt to bring in more rigid structures wouldn't work since brilliant ideas come out of untraditional ways and settings.*
>
> Andreas Riedler

Hörtner has stood behind his decision stating, "At least now we can guarantee a certain level of stability." Interestingly, one recent artist-in-residence commented that he feels that management is still too thin, i.e. that Hörtner and now the key researchers are particularly overworked.

Since staff is too absorbed in keeping pace with workload, one of the problems with the current organizational structure is still the lack of project documentation. The FutureLab does not have a formal documentation system. "This is hugely different from the scientific research environment. Here, it's the project itself that serves as a document instead of the publication of our research results—even though every once in a while someone does publish something." "Even if I had the same problem last year on a different project, sometimes it's still hard to deal with the new problem without documentation." Some said they have set up their own documentation system in case of emergency. Lack of such a system poses a serious risk if, for whatever reason, staff members suddenly leave as they would take organizational knowledge with them. While this is the case for any organization, at the FutureLab it is particularly dangerous because of the small size of the team. Each person has become a critical node in the net.

2.3 Basic Research Approach

FutureLab staff members, whether formally trained in art school or not, are encouraged to approach projects with an artist's spirit of open-ended exploration of new ideas. The idea is to foster creativity first and foremost. At the same time, they also know how to achieve tangible, durable results. Their business world pragmatism and professionalism has ensured the lab's success, especially when dealing with external clients who expect tangible results. Each year, staff has a serious deadline to produce installations for the AEC that debut during the Festival. In this way, they have gained valuable experience in building projects that high volumes of visitors can move through and interact with in a public setting: "We know how to build a project that still

works even after 100,000 people have touched it." In this sense, "the visitors to the Museum are like a test field for our projects." "We can really see the results, which is gratifying if we did things right and if not, we can modify things." The goal on almost every project, whether for Ars Electronica or other clients, is to create something that goes beyond the demonstration stage.

The FutureLab's research approach shows some signs of regimentation, e.g. Festival deadlines. Yet, for the most part, everything seems to function based on an honor system and unwritten rules. The team has the freedom to get the job done as they see fit. In other words, deadlines are given and people are expected to meet them according to individual time management. It is often to reach goals within tight deadlines:

> *Here, there is always an opportunity to find many different solutions to a problem. But here, the challenge is to get into a problem typically in a shorter amount of time than is given in standard research environments.*
>
> Robert Abt

Much of the time constraint has to do with the high volume of projects that are typically in the pipeline at any given moment, i.e. the more projects underway, the more juggling each person has to do to meet deadlines for each project.

One interviewee who was initially trained as a visual artist in video and photography made these revealing comments: "Things tend to happen very quickly and spontaneously here as compared to university, where I was taught to work for a while on a concept—which is both positive and negative. I still wonder what the right balance is between incubating ideas for a while before starting production given our typically tight deadlines here at the lab." Employees say they find themselves in a situation of "organized chaos." Recent artist-in-residence Christopher Galbraith agreed that at the FutureLab, "Everything happens by chance and circumstance. There are no set rules which is part of the excitement but also the stress of it."

Some of the challenges from the fishnet model herein come into play, e.g. knowing how to be flexible within constantly changing parameters, and knowing how to manage projects in the immediate term without forgetting the need to plot long-term objectives.

Despite these natural concerns, staff seems to stay on board because they have the opportunity to improve their skills, eventually thriving on this environment of unpredictability. As management guru Peter Drucker has stated, "Innovation is the specific tool of entrepreneurs, the means by which they exploit change as an opportunity for a different business or a different service." The FutureLab research model is motivated by an entrepreneurial approach. One person believes that since staff is given so much autonomy and flexibility, "This creates a place for individualism and creativity." As another researcher expressed:

> *If a project starts simple, then I always set a new goal to push development further.*
>
> Reinhold Bidner

Staff seems genuinely motivated to do their best to keep pace with Moore's Law.[62] Personal projects can also become research tools. Any discoveries made on one's own time can be transferred into FutureLab projects. Staff members can work on their personal projects as long as immediate deadlines on official projects for the AEC or external clients are met. This freedom to propose new concepts, derived from whatever means, is widely appreciated by the staff: "Elsewhere, I've seen a lot of people with great ideas but who never get to the point to actually implement them."

The focus on learning is an important feature of the FutureLab's basic research approach. Management feels that the employees are the lab's most valuable assets. The better skills they

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[62] Moore's Law refers to the observation made in 1965 by Gordon Moore, co-founder of Intel, that the number of transistors per square inch on integrated circuits had doubled every year since the integrated circuit was invented. Moore predicted that this trend would continue for the foreseeable future.

have, the more prosperous the organization will be. "We try to keep increasing the level of competence of current staff." This is one of the most attractive qualities of the lab for employees. "Learning is the one of the best things about this place." Most organizations would say the same thing about the primary importance of human resources. Yet the FutureLab's attitude and approach to training is exceptional for a few reasons.

Firstly, there seems to be a shared sense that improving employee skills is important for the greater good of the group, versus for the elevation of certain individuals: "Many staff members are teachers, so there's lots of in-house knowledge." "The goal of my colleagues is never to be a superstar." If someone says, 'Hey, I've always wanted to know how this works,' then he can ask one of the resident experts who will always take the time to explain." Secondly, the objective is to train modern-day Leonardos. Though each new employee arrived with a particular area of expertise, management felt it was important for staff members to be more than just specialists in one field. "I consider everyone here as experts, i.e. they have the interdisciplinary ability to look into many fields, at the borders between fields and come up with interesting solutions there where there's an overlap." The idea in encouraging this kind of expertise is to increase effectiveness. It also keeps staff size down and helps maintain the start-up feel in the office.

The FutureLab's emphasis on investing in human resources actually becomes a significant factor for cultivating long-term partnerships with external clients. Among the most revealing insights from interviews came through a conversation about client expectations: "By asking anyone from a given project team to do a presentation for a customer, it forces employees to build presentation skills and social skills. We place a lot of value on that." Through interactions during project development, clients come to appreciate the diverse capabilities of FutureLab employees. Apparently, clients have pointed out that the virtuosity and versatility of FutureLab staff is some of the things that boost the lab's competitive edge. Clients appreciate the fact that a

person in the lab can successfully perform effectively both in internal project planning meetings and, if necessary, in external presentations on behalf of the client.

Overall, the FutureLab's research approach differentiates it from traditional research environments. One person remarked, "Our fluid project management process, both our way to form project teams and manage new projects, is definitely unique for a research lab but perhaps not for, let's say, a multimedia design shop." The FutureLab wants to consider itself anything but a design shop that takes project commissions, delivering end products more or less according to the client's guidelines. Rather, it makes every effort to take jobs that will allow staff to participate in every stage of the R&D process, especially to be actively involved in the earliest stages of defining the project objectives and scope. Like design shops, the kind of R&D work done in university labs in Austria also "tends to be fairly conservative... They typically start with something already established as basis for work, e.g. to work on the reiteration of the design of an overall software architecture." FutureLab staff claim that most of their projects are very new as far as conducting cutting-edge research and making inroads into new technology developments.

2.4 Technology Research & Development

Staff constantly experiments with technologies available on the market 1) to push capability and performance in new directions and 2) to imagine the aesthetic applications of existing tools and applications. More importantly, they place a strong focus on inventing new 'in-house technology developments.' Through a "garage approach," i.e. an unstructured experimentation process, they aim to build the most robust, customizable, and affordable solutions, such as low-cost PC-based, interactive, and real-time applications. For example, the games industry sells high-quality editors that allow users to create their own gaming worlds. The FutureLab has followed the lead of the military, co-opting and repurposing game engines developed by the games industry. The team eventually transformed and applied some of the tools

coming out of this research project beyond their original use, i.e. they became products in their own right, including:

- 'Palmist': A software tool that enables users to administer PowerPoint presentations by means of a handheld PC linked up to a wireless LAN (local area network).
- Linux-based software for the supervision and control of most typical hardware and software media devices such as DVD players, projectors, DMX and Midi (music recording/production) devices, LED crawi-text displays, biofeedback sensors, etc.
- VR Goggles: A moderately priced, stereo, see-through head mounted display for AR applications.
- VR Flip Chart: A surface that can be used in conventional fashion with paper, as an electronic blackboard, and to run computer programs ranging from PowerPoint to stereoscopic VR applications.

The FutureLab's in-house technology development is about scalability and efficiency:

> *We take scrap material from one project and use it in another. This prevents us from making the same mistakes twice.*
>
> Andreas Jalsovec

The FutureLab focuses on prototyping existing or new tools in one project in order to influence another project's development. One researcher described several examples related to his experiments with animation and real-time development intended to create more user-friendly VR environments. In 2001, he collaborated with an architect on the FutureLab project "Landesausstellung," a walk-through VR model of an exhibition concept based on a game engine. The goal was to produce different versions of the concept and gauge the impact each version would have on visitors. The model in turn served as the basis for the FutureLab's design of the pavilion for the Austrian Province of Carinthia's Expo 2002. The same researcher worked on a project collaboration for German visual artist Johannes Deutsch to create an interactive painting for the CAVE, 'Gesichstraum' (2002). He was able to take some of the new 3D modeling techniques he was experimenting with on a visualization and apply them to another project for an

industry client that was underway at the same time. The FutureLab's art projects, therefore, in some cases become beta projects for industry commissions.

In-house development is also vital since it allows for flexibility. Referring to one of the projects created by an artist-in-residence last year for the AEC Museum 'Hidden World' exhibition (to use augmented reality to visualize sound), one lab staff member stated, "There were so many risks that we took that couldn't have been taken if we were doing that same project for a company." This risk-taking attitude is facilitated by the AEC's philosophy to fashion the Museum into a place for exploring new terrain. In other words, the Museum becomes an acceptable place to exhibit raw ideas, not only finished products and refined projects. Again, artistic research can eventually feed into more commercial projects. With the Hidden Worlds example, perhaps there is a possibility for the reverse to happen, i.e. for the artistic research to one day feed into a commercial product.[63]

Overall, this development process makes connection to both a cultural institution and corporate partners equally vital:

> *Production has always been an integral part of this concept of the Museum of the Future and so commercial production is not necessarily something that moves us away from our nonprofit status because a lot of this production is artistic research.*
>
> Pascal Maresch

At the same time, the constant flow and evolution of technology developments between artistic and more commercially focused projects makes absolute categorization of projects difficult. In other words, the team seems to agree that focusing on such binarism is irrelevant: "Our so-called commercial projects are only possible since we're also doing so-called art projects and in-house development work." "We did many projects over the last few years that were more commercial

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[63] With the artist developer, we discussed the possibility of the project being used as a device to help people retraining vocal chords after recovery from a serious accident.

in nature, featuring some aspect that was brand new in terms of the technique. For sure, they were not artistic projects but at the same time I would say our primary objective for these projects was mostly for research rather than for a specifically commercial purpose." The point to emphasize is that they attempt to maintain a consistent approach no matter the project.

The basic shared philosophy at the FutureLab is that there is no difference between work done for a company and a concept for an art piece in a huge exhibition: "Both things need to be done and we treat the projects with equal importance and professionalism." In addition to allowing for scalability, efficiency, and flexibility, this process of in-house development also ensures sustainability of lab's research model: "All of this work is important because it's like sowing the seeds, so if we don't resow the ground with our own development work, then it won't be a good harvest."

The FutureLab's preference to blur the line between art and commerce could be expected of an interdisciplinary team of artists and scientists. New media artist David Rokeby stated that, "While engineers strive to maintain the illusion of transparency in the design and refinement of media technologies, artists explore the meaning of the interface itself, using various transformations of the media as their palette."[64] Maybe the lab's R&D approach more accurately echoes a recent trend outlined by scholar R. L. Rutsky who challenges both the modernist notion of technology as an instrument or tool and the conventional idea of a non-instrumental aesthetics: "Today, technology and aesthetics have again begun to come together: even basketball shoes are said to exhibit a 'high-tech style' and the most advanced technology is called 'state of the art"(1999).[65] That said, the fact remains that the FutureLab resides within a cultural institution

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[64] Rokeby as quoted in *Remediation* (Bolter/Grusin, 1999: 42)

[65] The term technology can be traced to the root word 'techne,' which Aristotle meant as all art, skill, or craft. In other words, techne was originally equivalent to "fabricate, build, produce." (Berger 1986: XX) Cultural studies scholar Raymond Williams said that 'technology' was used from the 17th century onwards "to describe a systematic study of the arts or the terminology of a particular art." By the mid-nineteenth

and, as such, it will be impossible to totally forget these binary categories. Ars Electronica will constantly and unavoidably be forced to justify the FutureLab's work for corporate clients, especially as long as it continues to exhibit any commercially oriented projects in the Museum.

Unlike other applied research labs operating in more traditional academic or corporate settings, the FutureLab's position within a nonprofit cultural institution ostensibly gives staff the freedom to operate without the pressures of a for-profit institution. Yet ironically, the FutureLab is creating such pressures for itself. The team constantly pushes itself toward exactly that. They believe they have a competitive edge as an arts lab precisely *because* they have not had to give up on pure science.

Aside from dealing with public opinion and management issues, a more complicated issue the FutureLab will have to deal with as it forges ahead with more commercially oriented work is intellectual property (IP) management. According to the director of the Kepler University lab, "This area is underdeveloped and definitely in need of improvement at the FutureLab. We have some shared patents, but the rights of exploitation are in the hands of our industrial partners simply because we lack the financial resources needed for worldwide patent registration. Our greatest need is a system to regulate IP rights and the transfer of research results to a business." The current high demand for some of the lab's latest and most ambitious in-house developments will necessarily force a solution to IP issues sooner rather than later.

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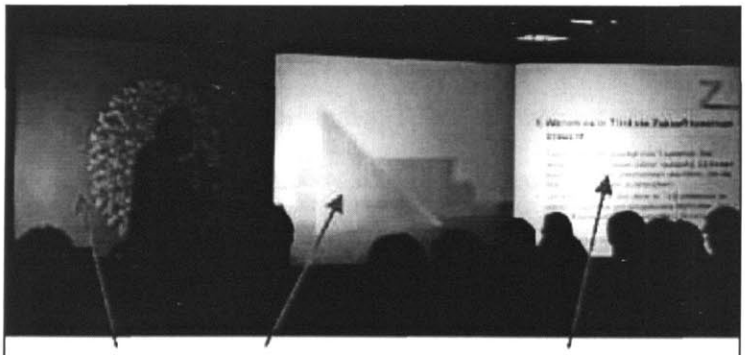
century 'technology' became fully specialized, referring to the 'practical arts' in their own right. The split between art and technology is, therefore, a false dichotomy resulting from the separation and transformation of those terms over time.

2.5 Benefits & Consequences of the Model

When the FutureLab formed in late 1996, the CAVE was the only platform widely available for staging 3D virtual reality in a totally immersive environment. By 2002, the FutureLab unveiled a PC-based version of the CAVE called the 'Arsbox' (See **Figure 5**) at SIGGRAPH, the most important annual conference for the computer graphics industry. Scalability is limited by lack of mobility, high cost, and difficulty in adapting the basic CAVE platform to new technologies.[66] In addition to dealing effectively with these scalability issues, the Arsbox supports a wide range of content, from VR to video and standard content from PC applications, on up to 64 screens. It has attracted a lot attention from organizations in the market for a more affordable, versatile, high-end multi-media presentation platform.

Figure 5: The *'Arsbox'*



Video playback. 3d-Environments (in stereo) and power point slides

(Image from AEC ©2002)

The Arsbox is not a completely new breakthrough.[67] Several other research labs and companies have developed integrated, projection-based VR systems[68] as an alternative to the

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[66] At the time of my field research, I learned that the FutureLab was workingk on adapting its own portfolio of CAVE VR projects to the Arsbox platform.

[67] "With the immense growth of graphic display power in the PC-sector, pushed forward by the PC-based games industry, the development of PC-based VR devices was only a question of time. Now there are several PC-based systems challenging workstation-based Virtual Environment (VE) technology, most of them offering some CAVE-type environment generated by a PC cluster. Most CAVE systems consist of 3

CAVE system. In addition to the product itself, the FutureLab's ability to develop custom content, from storyboarding to an end product, is the real selling factor for many clients who might not otherwise decide to outsource to them. Three standard packages bundle the Arsbox hardware and software solutions for different types of clients, from those that can implement a nearly turnkey plug-and-play solution to those that prefer more comprehensive developer support for content development, installation and maintenance. Approximately 40 of the 80 inquiries generated since the SIGGRAPH presentation were serious leads, about 70 % of which came from universities and other research labs (including corporate labs), 20 % from VR content providers, and the rest from miscellaneous companies.[69] At the time of field research, the FutureLab was pursuing about a dozen 'hot projects'[70] for the Arsbox.

According to Hörtner, the launch of the Arsbox marked a turning point in part because it suddenly became more apparent than ever before to clients that, "We're not just a bunch of crazy guys doing art work." At the same time, the team ultimately covets recognition first and foremost as an artslab. They have received such recognition. Just at the moment when staff was debating in late 2002 how to handle a deluge of Arsbox commissions from companies and other research labs, the City of Linz gave the FutureLab the most prestigious municipal art award. Several employees commented that that award proves their creative work has cultural value deserving of

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to 6 flat display walls, rear and/or direct projection, tracking of user view and interaction, visual depth (achieved by stereo image display), spatial audio": Excerpt from description from the *VEonPC 2001* International Workshop, St Petersburg, Russia.

[68] The PC-CAVE by Zhejiang University in Hangzhou, China (1999); the NAVE system, developed by Georgia Tech University in collaboration with the University of Santiago de Compostella in Spain and funding from Microsoft and the National Science Foundation (2000); the Low-Cost VR system by the University of Buffalo, NY (2001); the HyPI-6 by German company Fraunhofer IAO (2001).

[69] Statistics provided by the sales and technical manager for the Arsbox at Kepler University, Linz.

[70] One 'hot project' is for a Greek company that develops information systems and has some specialization in VR. As a content provider for the Greek Ministry, this company is interested in collaborating with the FutureLab on an Arsbox project for the 2004 Olympics. Inquiries came from other content providers include companies interested in building VR environments for command and conquer systems for battlefield simulation.

recognition. While the award shows that the FutureLab has made a remarkable contribution to the local arts community, it is important to emphasize that it was given to the FutureLab by local government, an entity predisposed to have a favorable opinion of the lab as the AEC's oldest supporter.

The Arsbox is also an interesting example since it represents both the kind of innovation the FutureLab is capable of producing, and the difficult decisions that such creativity and productivity is forcing the team to make. On the one hand, the Arsbox has introduced the team to new clients and interesting research problems. On the other hand, the Arsbox is also causing the staff to rethink the extent to which they should venture into more commercial work given the increasingly heavy workload.

The biggest risk the FutureLab faces is potential for staff burnout. Employees do not consider themselves as "slaves" like researchers in traditional university labs where, by comparison, there is no opportunity to propose research topics and help decide the direction of projects. However, some admitted that there are definite compromises to the FutureLab situation: "Sometimes it's really hard to maintain private life." The most serious consequence of burnout would of course be for employees to leave the organization. At this point, the majority of early staff members who hold the bulk of the organizational knowledge are still onboard. A side effect of staff departure of employees would be the loss of this knowledge.

Employees are undoubtedly the lab's core assets. Management has to ensure that benefits outweigh costs for staff. A few people have left the lab to take other jobs that might offer higher salaries and benefits. Even though the FutureLab is part of a nonprofit organization, it was a bit surprising to learn that most of the staff (including the director) works on a freelance basis, earning fairly low salaries without much in the way of health benefits. However, people tend to stay at the FutureLab not only for the opportunities the unique research environment affords

them, but also to remain with a strong team that has become like a second family and constant source of inspiration. The tradeoff of leaving is clear. In the words of one artist-in-residence, "European companies are generally not as risk taking as in the US." The people he knows who have left the FutureLab to take corporate jobs are "well-paid but I'd imagine extremely bored."

Nevertheless, the options are not very obvious for alleviating some of the pressure on staff. It is perhaps too facile to suggest that the FutureLab lower the bar a bit more often by taking "easier" commissions, i.e. those that can be executed more quickly and through tried and true research methods. Such a move could cause exactly the same effect of boredom for employees as moving into a corporate job. At the pace the lab is going and the potential for burnout, one recent artist-in-residence said went so far as to say that it might even be a good idea for the FutureLab to consider becoming a service bureau, i.e. conduct temporary research activities for cultural institutions, e.g. selling services to other museums like multimedia agencies, as does Art+Com in Berlin. Based on staff comments, this would also likely cause a mass exodus.

One person suggested depending less on external collaborators, "Instead of only increasing the number of external commissions, we should also do more projects that are driven from within the FutureLab." That seems to indicate that the more internally driven projects they do, the less of a threat there will be to upsetting the research model, staff sanity, etc. Another said:

> *I'd like to do more artistic work but I understand that it's easier to get funding for commercial projects.*
>
> Stefan Mittlböck

However, that is only possible if they can depend on a combination of surplus revenues from a minimum amount of external projects and the basic budget allocated to them by AEC (much of it coming from public funding sources). Given the current economy where public funding is steadily decreasing in Europe, it seems that corporate support is more important than

ever for nonprofit institutions like the AEC. At the same time, tough market conditions mean that corporations today are equally cautious about investments. They need to work closely with the FutureLab in order promote the FutureLab's style of interdisciplinary research to prospective corporate clients.

Chapter 3

Toward Meaningful Collaboration

Until the founding of the FutureLab, the only thing that we could do with corporations were sponsorship deals that more or less followed the traditional model. With the launch of the FutureLab, the Ars Electronica Center suddenly had the chance to create a much more differentiated exchange of values, not just the usual image transfer associated with corporate sponsorship of cultural projects.

Gerfried Stocker

The current configuration of the FutureLab would not have been possible without the strong reputation of Ars Electronica and connection to the Ars Electronica Center. However, Gerfried Stocker and the rest of AEC management are now looking at the lab's approach to corporate collaboration in order to help shape the AEC's overall strategy for working with industry. Ars Electronica still welcomes traditional corporate sponsorship (i.e. basic in-kind and financial support). It now aims to develop more long-term and mutually beneficial collaborations with corporate partners based on project work. In the FutureLab's R&D collaborations, the keys to producing projects that both parties are satisfied with lie in establishing effective communication and developing a shared strategy for executing on project plans. This collaborative approach will give the AEC a chance to fully explore the possibilities of sharing resources and ideas with its partners (including working on projects across the various divisions of the AEC—Festival, Prix, Museum, FutureLab) and also help ensure AEC organizational stability.

With the recent downturn in the economy, nonprofit and for profit institutions alike are revising funding and partnership strategies in order to better meet organizational objectives. Cultural policymakers have identified the phenomenon of 'hybridization' whereby cultural

institutions are adopting corporate management practices. Many corporations have realized the need to be, on one level, more practical in all investments by outsourcing to the most capable vendor, as in the case of the collaboration between the FutureLab and Austrian company FACC. Other businesses, especially global companies with more resources, have embraced corporate affairs strategy of 'corporate citizenship' in order to maximize long-term, mutually beneficial outcomes, as in the case of the collaboration between the AEC/FutureLab with the German multinational SAP. The framework for effective collaboration is intact. While AEC management is learning from the FutureLab example, it is also promoting the lab's activities to wider audiences.

- How have changing economic and political conditions in Austria and Europe influenced the AEC's collaboration strategies with corporate partners?
- When and why did corporate affairs strategies begin to focus on the notion of citizenship? What is the strategy behind corporate citizenship versus corporate sponsorship?
- What are the benefits to corporations in developing collaborative projects with the FutureLab and the AEC?

3.1 A Changing Economic Landscape

The City of Linz has provided steady operational support for the Ars Electronica project for two decades. However, the progressive funding policies that allowed for the establishment of the institution have been gradually subsiding. The local economy was significantly affected by recent political change at the state level. In order to relieve funds to invest in the creation of jobs and revive the economy, the new government that took power in Austria in 1999 ordered extensive budget cuts for arts/culture.[71] According to AEC director of marketing and public

[71] Before 1999, there was a coalition government of between the black party (Christian Democrats) and red party (Socialists). In 1999, the blue party (right wing) assumed the other half of the coalition government along with the black party. According to Kurmäyr, neither of these parties is very interested in public funds

relations Ursula Kürmayr, "With these public funding cuts from the top, there was a domino effect starting with the Republic of Austria which gave less money to the region of Upper Austria which in turn gave less money to the City of Linz."

Even though the local government still contributes significant funds to the AEC, the recent national funding cuts were felt that much more by the AEC since the artistic focus of the AEC falls outside of the arts/culture priorities of the Austrian state. Kürmayr explained that, in general, the situation in Austria is very difficult "because only the large cultural institutions in Austria are fully supported by the Republic of Austria,[72] for example, the largest museums in Vienna. So only these places receive fixed allocations, which has meant that the reduction in overall funding has only affected other institutions like the AEC that do not receive these fixed allocations."

The director of the FOKUS, the Austrian Association for Cultural Economics and Policy Studies confirmed the challenges faced by arts organizations today: "The public financing for culture and the arts have been continuously reduced and this is especially difficult for new media arts programs which were generally under-funded from the outset."[73] Despite the limited amount

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for political actions (in other words, funding innovative cultural programming, in the spirit of the progressive Social-Democratic initiatives of the 1960s and 1970s mentioned at the beginning of Chapter 1).

[72] While public funds are mostly allocated to the AEC at the local level, Kurmäyr acknowledged that it is not impossible to get money directly from the Republic of Austria. For example, the AEC recently made a special request directly to the Republic of Austria for 500,000 schillings (approximately 36,000 euros) request made for support of the Festival. However, that amount is fairly modest considering the overall costs needed to run a major arts festival.

At the same time, EU grants for art and culture have declined. Whereas during the 5th Framework (which ended in 2002) the EU considered 6 proposals for European projects dealing with technology and cultural, with background in arts/culture, in the 6th framework (which is just beginning) Kürmayr said the focus is on supporting large companies, especially those in the IT and communications industries, since job creation in those sectors is a top priority. Therefore, cultural organizations like the AEC cannot send in proposals.

[73] Excerpt from an email interview with Monika Mokre, director of FOKUS (April 2003). FOKUS is a small non-profit-initiative. Although it does not have an official position in Austrian cultural policy or

of public support available for new media arts, the AEC has received a lion's share. This has perhaps caused some animosity among others vying for the same funds. As Stocker put it, "It seems to be an unavoidable, ideological thing here in Austria that opposition from other artists and artists lobbying groups who say if that if an organization like the AEC gets so much money for a grant, then why shouldn't they also have an opportunity to get big grants." Despite the relatively significant support it still manages to receive, the general mood is one of instability.

Arts and culture are now luxury goods in Europe.

Ursula Kürmayr

Kürmayr's statement is dramatic. Yet it underscores the concern among cultural program directors and administrator about the effects of current economic unpredictability. Overall, the Austrian government's reduced spending on arts/culture can be directly linked to the sustained economic downturn across Europe over more than a decade.

In Europe, arts and cultural initiatives have traditionally been majority-funded by the public sector. The European Community (EC) was originally founded on economic and commercial principles, yet it developed a cultural dynamism that aimed to give the new Europe a new cultural profile. In the mid 1980s, the EC outlined a framework to promote a common European cultural identity, while at the same time preserve local cultural heritage. (Van de Perre 1988: 103) Yet, an economic crisis was afoot that triggered a steady decrease of public funding for the arts. State budgets tightened with the introduction of the Euro and the push toward privatization of formerly state-run firms. As a recent Economist article reported, "State funding of the arts is shrinking in real terms in many parts of Europe, even in countries such as Austria,

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academia, it is well respected among international and Austrian scholars and practitioners of the arts.. State cultural policy is divided between the Austrian Ministry of Education, Science, and Culture and the State Secretary for the Arts in the Federal Chancellery, the latter of which is responsible for new media.

Germany, and Italy that have long been wedded to it. As a result, arts organizations are having to learn how to raise money more energetically themselves."[74]

3.2 Funding Strategies of Cultural Institutions

Many cultural institutions have reacted to economic shifts in a noticeably effective way. The situation at the AEC reflects an emerging trend in the management strategy of forward thinking cultural institutions. Since the early 1990s, cultural policy makers in both the US and Europe have used the idea of 'hybridization' to describe the process of changing organizational structures of cultural institutions. It is used as an alternative to the often-used term privatization. Whereas the latter suggests commercialization as an end-goal, financial rewards can be one result of hybridization rather than the primary objective.Professor J.M. Schuster[75] imagines cultural organizations as hybrids that bind together "multiple governing authorities, or at least multiple sources of influence and power" (in Boorsma 1999: 62). Therefore, nonprofit management strategies are retained and simply mixed with other common practices. As public funding becomes less reliable, cultural institutions have embraced the corporate model since it encourages efficiency in business operations and provides clues on how to re-design management systems and procedures. By using many sources of financing, if well managed, cultural institutions can "create more opportunities for non-typical cultural projects to be implemented" (Ilczuk 2001: 20).

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[74] "Hands in their pockets - Private money for the arts," *The Economist* (2001)

[75] Schuster (professor of Urban Studies at MIT) has written several provocative essays about the hybridization of cultural institutions, specifically museums which builds on the work of other scholars like Stephen Urice and Steven Weil. Schuster is primarily concerned with studying the management practices of museums (e.g. how museums deal with tax laws) in order to improve the ability of cultural policy makers to predict institutional behavior.

Essentially the hybrid approach allows them to create administrative and financial boundaries in order to be more independent and self-governing.[76]

It is useful to consider this concept of hybridization in order to emphasize the relevance of current AEC management practices. In hybrid cultural institutions, "Output quality is inexorably raised by the reorientation of cultural activity towards the private sector" (Throsby in Boorsma 1999: 53). Ars Electronica has always aimed to offer the most compelling and professional quality projects and programs through all of its activities. Organizational restructuring based on a hybrid approach has allowed for a sustained, if not improved, quality level. This means that in addition to cultivating industry partnerships, Ars Electronica's focus on explicit for-profit activities is a widely recognized as both a legitimate and smart strategy for managing a cultural institution. Furthermore, a recently published study verifies that hybrid management practices are even more vital for organizations supporting new media art. The current "new era for the arts" is characterized by more complex organizational structures in which traditional distinctions between commercial and nonprofit organizations will blur (McCarthy/ Ondaatje 2002: 16). Cultural institutions like the AEC are increasingly forced to focus on earned revenues as they can no longer depend as much on public subsidies.

The AEC set up a second organization in 2000 for the sole purpose of generating revenues that could supplement reduced public funds. The 'Digital Economy' (DE) is a for-profit entity within the AEC. Essentially a web design shop, the DE has a small number of clients, e.g. the City of Linz that was eager to have a website when the web was still fairly new. Other DE

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[76] IRCAM (as mentioned in Chapter 1) is another good illustration of a hybrid cultural institution. It began as a public entity, specifically as the music department of the Centre Georges Pompidou (CGP) contemporary art center. In 1977, it gained an unusual legal status as a semi-autonomous private association with its own statutes while retaining some important links with the CGP. Today, as a private association, it can employ foreigners, has managerial and financial flexibility, and is able to receive private patronage. IRCAM receives Ministry of Culture funds via the CGP, but also has representatives from several key public bodies of its external executive board (Born 1995: 105).

clients are Ars Electronica corporate sponsors like Quelle, [77] a German mass retailer of consumer products, which is also the most important web client. While some might believe that the purely commercial nature of the work of the DE compromises the AEC's primary cultural mission, Kürmayr confirmed that all DE contracts are very carefully negotiated. By law, any DE revenues are restricted for reallocation to other AEC activities to cover operating expenses.

The AEC's funding structure actually allows the institution to maintain a core focus on its cultural mission. As Stocker explained, "Our for-profit activity is simply a tool to be able to create other options for sponsors so that they become interested in getting involved in our central activities.... When we do a job for a company, a majority of the funding gets eaten up in administrative costs. So you imagine that the margins that can be generated from this are never very big. But if you're talking about an institution like ours that's still significantly funded by the government, then you have to make sure not to use money in order to be a better web design company." This comment indicates that the AEC is also very conscious of the way government keeps close tabs on the financial management practices of cultural institutions receiving public funds. It is safe to say that the AEC has been engaged in such self-assessment and self-regulation practices since it was founded precisely given the experimental nature of its activities. In other words, as a new kind of innovative institution, it has developed a habit of carefully plotting everything from event programming to its finances to ensure sustainability.

Today, 40% of AEC revenues come from direct public funding, while the rest is covered by internal activities, i.e. a combination of corporate sponsorships and collaborations, revenues generated from the activities of the DE and space rentals to various organizations for special

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[77] Quelle became an AEC sponsor in 1996, giving both financial and in-kind support (TV sets). The Quelle website is a massive project since it involves not one, but three websites for the company's European locations.

events at the AEC Museum.[78] Overall, the move toward for-profit activities in this funding structure is interesting both as specific to the AEC and as a general example. The fact that the AEC derives the remaining 60% of funds from non-public sources is significant especially in the European context. The question remains to what extent that non-public pool of funds can and will increase with the evolution of economic conditions. In the case of the AEC, local government will likely aim to remain a significant funder, I would argue namely in order to remain connected to Ars Electronica's growing network of corporate partners. More generally speaking, from a corporate sponsor's perspective, a well-managed cultural institution is naturally the most desirable kind of partner. Such a demonstration of fiscal responsibility indicates the company that its sponsorship contribution would be used in the most efficient and effective way. Put another way, it demonstrates the cultural organization's creativity in all its undertakings, even financial management. Once essential confidence is gained, one possible effect could be for the company to decide to increase its level of support over time. The increase would also likely be by a significant level, so as to offset the original deficit of the cultural organization.

The FutureLab's financial situation is structured such that it essentially operates on a break-even level, where fixed costs equal variable costs. It can maintain this strategy since all of its fixed operational costs are covered by the AEC, which also manages the budget for the other major divisions of the organization (Museum, Festival, Prix). Whereas the AEC reallocates DE revenues to cover operating costs across the organization, any revenues generated by the FutureLab are strictly reattributed to future research projects, i.e. to cover variable costs. Kürmayr

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[78] Renting space for special events is standard museum practice. Yet whereas most museums restrict rentals to corporate sponsors, trustees or other major affiliates, in the AEC's case, any organization—including school groups, businesses, cultural groups, government offices, etc—or private individual can rent the classroom, theater, and café/lounge space in the Museum. This aligns with the mission of the AEC Museum to provide a meeting place for the public. In addition to generating additional revenues, the thought is that the more opportunities the general public has to come into the space, the more that will generate interest in the exhibitions on view and create an awareness of Ars Electronica activities in general.

said, "The FutureLab never had and never will have any sponsors." It seems that in her mind, the FutureLab functions much like the DE in the sense that it produces projects for external clients. Therefore, she groups the lab on the for-profit side. However, technically the FutureLab is a nonprofit entity. Stocker explained that this is "more a situation with taxes." Nevertheless

Hybridization is, in fact, an appropriate way to describe more general trends in management restructuring across all sectors of society. Like the phenomenon of hybrid cultural institutions, the Fourth Sector or 'For-Benefit'[79] encompasses a wide variety of models of cross-sector partnership, from cause-related marketing to venture philanthropy. The objective is to bring resources to social issues in an entrepreneurial manner, i.e. maximize efficiency and cost-effectiveness by pooling resources. Corporations are the major catalysts to the formation of these new models of partnership.

3.3 Corporate Affairs Strategies: From Sponsorship to Citizenship

Corporate affairs strategy is a broad concept that refers to a company's guidelines for interacting with core constituents. The idea is to cultivate and maintain good community relations since they ultimately encourage profitable business activities. Sponsorships are one popular component of corporate affairs strategy. Corporate sponsorship programs were established during the post-war period of economic revitalization and dramatically developed within an environment of the free market economy in subsequent decades. Corporate sponsorship involves the in-kind and financial resources a company gives to another organization (generally a nonprofit or public organizations) in order to gain access to the latter's core constituencies. Access is typically gained through direct networking opportunities, e.g. mingling with a museum's board of trustees and

[79] For more information on the Fourth Sector, visit <http://www.fourthsector.net/>

members at special events, or through general promotions, e.g. displaying the sponsor's corporate logo in the cultural institution or its promotional materials.

The late 1970s and 1980s witnessed unprecedented corporate growth worldwide, creating a climate for the rapid evolution of corporate sponsorship strategies. This fast growth in sponsorships happened in particular since they afforded what was perceived as a tangible return on investment. Sponsorship can be considered as the obverse of corporate advertising. Today, corporations are increasingly choosing sponsorship over advertising as a marketing strategy. Research has shown that there is a certain level of corporate disillusion with media advertising and, by extension, the perceived relative effectiveness of sponsorship as a method of marketing communications (Meenaghan 2001).

The American model has been widely copied by other countries.[80] The UK was the first European country to embrace the American style of promoting arts sponsorship as big business. In fact, the evolution occurred nearly simultaneously on both sides of the Atlantic, spearheaded by the US and UK governments.[81] Although European levels of corporate sponsorship are steadily rising, there is a long way to go to catch up to the US. A recent report on international trends in sponsorship stated that European companies increased allocations by year-end 2002 by 3%, to $7.1 billion USD from $6.9 billion (6.3 from 6.1 billion euros), out of a worldwide total of $24.4 billion USD (21.7 billion euros) (IEG 2002). By comparison an American Association of Fundraising Counsel report published in late 2001 stated that corporate charitable contributions

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[80] In a recent interview (March 2003), J. M. Schuster commented that many countries skipped straight from the corporate patronage to corporate sponsorship. Patronage involves philanthropic giving, i.e. charitable donations theoretically with 'no strings attached'). This had to do with government encouraging business investment in the arts in order to offset reduced public funds. Schuster cited the UK government under Margaret Thatcher in the 1980s as a case in point.

[81] See Chin-Tao Wu's new book *Privatizing Culture* (2002) for a good comparative historical overview of the political and economic factors that influenced the two Western countries that pioneered arts sponsorship as big business: the US (under Ronald Reagan) and, in Europe, the UK (under Margaret Thatcher).

(i.e. philanthropic donations with no-strings attached, often cited in opposition to corporate sponsorships) *alone* equaled $9.05 billion USD (8.05 billion euros), representing 1.3% of corporate pre-tax profits, one of the highest shares of profits in recent years.[82]

Governments at the state and EU level have been encouraging business investment in the arts. In 1986, the European Council of Ministers for Cultural Affairs declared, "European cultural heritage and cultural activities in general should benefit from a combination of public and private support... Business sponsorship can enhance the cultural heritage and increase the production and dissemination of artistic activity. It should provide supplementary funding for cultural activities, not be a substitute" (Vanhaeverbeke in Martorella 1996: 83). Various associations that promote art-business partnerships[83] have formed across Europe. CEREC (European Committee for Business, Arts and Culture) serves as an advocacy organization for a network of national associations. Cultural heritage has always been a point of particular pride in Austria. A significant portion of the gross national product is derived from arts/culture and tourist industries. Arts sponsorships by Austrian companies multiplied in the 1990s. The Austrian Business Committee for the Arts (CEREC member) along with the ORF established the Maecenas Award.[84].

However, several reasons account for the relatively slow evolution of private funding models for the arts in Europe. The biggest roadblock is the limited offering of financial incentives. The generally poor economic situation, of course, has made this difficult for public officials to propose on a large scale. Kürmayr remarked that, "As far as incentives for

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[82] These AAFC figures do not include corporate sponsorships, volunteer time, donations of facilities or services—all of which do not quality as gifts under the US tax code.

[83] The models for these associations were the Business Committee for the Arts in the US and the Association for Art and Business in the UK.

[84] The Maecenas Award was named in honor of a famous Greek patron of the arts. Both the number of participating companies and individual projects submitted in the Maecenas competition had tripled since the first award was given, as reported in a 1996 article (Kossner in Martorella 1996: 104).

corporations that give to the arts in Austria, the only thing that has changed recently is the introduction of a law that says if big companies are funding museums, for example, then it's possible for them to get tax breaks. But those companies who choose the tax break are limited to just that, tax reduction, i.e. they cannot benefit from any other perks like marketing, public relations, etc."[85] According to Veronika Ratzenböck, a policymaker with the Austrian-based cultural policy organization 'kulturdocumentation,' "In this country, the estimated private sponsoring potential today amounts to about 2.5 percent of the public expenditure on the arts." Yet Ratzenböck confirmed that arts sponsorships have become an integral financial factor mostly for the flagship institutions and major traditional festivals in the arts sector (excluding Ars Electronica). Apparently, a more liberal policy for the tax deductibility of spending on art as a special expense has been announced, but not yet implemented.[86]

Many have feared the unpredictability of leaving public responsibilities for culture in the hands of marketplace demands. With an unstable economy, there is no guarantee for the private sector to be able to sustain support in the long term, leaving the door open to a loss of both public and private funding sources. Government support of the arts has been held in higher regard than private sector contributions, which the public easily judged as 'tainted,' 'self-interested,' or sometimes outright 'political' (Burlingame 1997: 92). Despite the very real economic roadblocks, many companies, particularly large multinationals, are adopting newer corporate affairs strategies intended to reform public attitudes about private sector sponsorship activities, as well as yield richer longer-term business benefits.

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[85] In comparison, the absence of state intervention combined with a helpful tax regime are the factors that have made the arts in America so 'self-reliant' (Cherbo 2000).

[86] Based on an email conversation with Ratzenböck (April 2003). See the Council of Europe's compendium on European cultural policies: < http://www.culturalpolicies.net>

Along with increased profits, multinational companies gradually began embracing a movement toward 'corporate social responsibility' (CSR). Economist Milton Friedman is credited with defining the original concept in the early 1960s: "The only social responsibility of business is to increase its profits."[87] As an excerpted quote, Friedman appears cynical. CSR in fact refers to corporate affairs strategy that defines the way companies manage business processes, from stakeholder relations to production management, to produce an "overall positive impact on society."

Over the last decade, many corporations have been reorganizing corporate affairs strategies under the general rubric of 'corporate citizenship.' Universities and government entities are also establishing think thanks and policy initiatives promoting the benefits of citizenship strategies. Corporate citizenship extends the concept of business responsibility by better defining the scope of key constituencies affected by business practices: "While companies are accountable formally to their owners (employees, customers, investors, business partners and governments), their basic business activities mean they are also, in less well-defined ways, accountable to the wider society and community for their actions" (Birch 1998). In other words, rather than simply making contributions to society (e.g. sponsoring a cultural program by providing financial resources), citizenship involves actively working with a community to improve society (e.g. creating a project that generates mutually beneficial outcomes).

According to one scholar, "Corporate citizenship is not a new concept, but one whose time has come" (Altman 2000). The global reach of many companies is having a fundamental impact on the daily activities of the average citizen. However, smaller companies might not have the resources at their disposal to widely apply the basic principles of corporate citizenship.

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[87] Friedman's ideas on corporate social responsibility were first formulated in his 1962 book *Capitalism and Freedom*.

although they might agree with those principles. In the end, corporations are only legally obliged to meet stakeholder interests. Many partner companies are motivated to outsource to the FutureLab first and foremost in order to conduct important research that contributes to product/service development and, in turn, meet business objectives and satisfy stakeholder interests. Corporate citizenship goals in the case of these partners are secondary but have the potential to become more significant over time.

3.4 The Collaborative Process: FACC & the FutureLab

Fischer Advanced Composite Components (FACC) was established in 1989 initially through investment from Fischer, the Austrian winter sporting goods manufacturer. FACC's core business is focused on the design and fabrication of fiber reinforced lightweight systems for the aviation industry, 80% composite materials for structural aircraft components and 20% airplane interiors. Today, it is the largest company in the aerospace industry in Austria and a leading player internationally, serving blue chip clients like aircraft manufacturers Airbus and Boeing as well as commercial airline companies. Company headquarters are located about an hour away from Linz. [88]

FACC came in touch with the FutureLab via the ORF (Austrian public broadcasting company), the exclusive media partner of the Ars Electronica Center. In 2001, the ORF invited FACC to participate in "Pictures of Austria," a monthly TV program that features different Austrian companies and innovations. The ORF decided to film that particular episode at the Ars Electronica Center Museum. FACC executives were given a tour of the AEC, which included a visit to the CAVE. In my interview with FACC CEO Walter Stephan, he recalled that that meeting jointly organized by the ORF and AEC turned out to be a timely marketing tactic since

[88] There are only 4 sizeable companies in Austria in aerospace industry. FACC is a 100% Austrian-owned public company with privately-held shares: <http://www.facc.co.at>

his company was seeking exactly the kind of 3D visualization expertise the FutureLab had to offer.

FACC was looking to win a new account from one of its major clients[89] and became convinced that the best way to do so was to "dazzle them with a presentation using the latest VR technology." By comparison, Stephan explained that physical models, which they had relied on until the recent past, take too long to develop and are extremely expensive to refine and transport to different presentation sites. FACC lacks sufficient in-house resources to produce a convincing enough computer-based 3D model that could edge out competition, the significant expense of time-intensive development cycles notwithstanding. Stephan sent out an RFP (request for proposal). The other possible vendors that responded to the proposal were mostly commercial companies. All were very capable, but ultimately not flexible on price. The FutureLab presented the best offer in terms of development capability, flexibility, and "overall price performance."

While FACC considered commissioning a project for the CAVE space at the AEC, they preferred the Arsbox platform. The idea was to bring the most impressive demo possible directly to the client's headquarters as that exhibited the greatest potential for the presentation to be seen by more VIPs and, therefore, have a deeper impact on the largest possible audience. Stephan decided it was worth the wait. He said the FutureLab could have offered a better price package given the current state of the Arsbox technology, which had not yet reached full mobility.[90] However, "we realized the constraints involved and the good efforts the FutureLab has been making to move toward full mobility, which is a fundamental reason for counting on this

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[89] Since FACC's client had not made a final decision as of the time of my field research interview with Stephan, he could not reveal that client's identity. The Futurelab was also under an NDA (nondisclosure agreement).

[90] Full mobility means collapsing the technology down into one laptop (i.e. making it possible to run the projections across several screens from one laptop) and, therefore making it easier to transport.

collaboration." Stephan said that investment in R&D is "the only way to make gains in the current bear market and deliver the best products to stimulate market growth. If that means spending a little extra now, then it's worth it." Even if the airline industry has a limited target market (as compared, for example, to the automotive industry) Stephan explained, "It's still very worthwhile to invest in high-quality product development."

FACC technicians worked closely with FutureLab staff to develop different mock-ups. Stephan noticed through the initial prototyping phases that the FutureLab knew how to meet deadlines and, therefore, his business expectations. In his opinion, one of the FutureLab's major selling points is that it is "not driven by financial results like most vendors." He was impressed by the fact that the lab's primary focus is rather "on setting and reaching a specific goal." That is exactly the impression FutureLab researchers hope to portray to external clients. More than the fact that FutureLab's position within a nonprofit institution affords the team the opportunity to focus on production over profits, they realize that their competitive edge is ensured by an ability to communicate well with clients:

> *One of our core strengths is being able to really listen to a customer and understand their goals, and then identify a strategy to reach those goals.*
>
> Christopher Lindinger

Moreover, as the result of clear communication, the FutureLab understands that helping a client reach business goals means maintaining a certain standard: "We always try to create something that's showable and useable. We definitely aim to get beyond projects that work only for a demo." By showable, they mean projects that are of professional quality. FACC's Stephan emphasized that the key to business success is exactly that:

Any company can claim to be able to do something but won't be successful if it has nothing to show for it...

Walter Stephan, CEO, FACC

Since FACC had a vested interest in ensuring that the Arsbox presentation would help them win business, it planned to work closely with the FutureLab to drive further development of the platform over the next several months. Stephan reported that the first mock-up shown to the client was "very well accepted," but at the time of my interview he was still awaiting the final client response. "There will be a strong impact from this kind of presentation for months, from a half a year to even a year from now. But naturally the impression will go away over time. So we might definitely want to use this tool more frequently." Therefore, Stephan confirmed the high probability for long-term collaboration with the FutureLab. "It's best to permanently outsource to the FutureLab as long as the client demand is still there in the future... As with any vendor, it's very important to stay in touch with the original developing party since they will always be in tune with the latest state-of-the-art."

Apparently, Stephan was not aware of the FutureLab until that fateful meeting at the AEC-ORF event. In retrospect, he said, "It did help to learn that Ars Electronica had such a good reputation." One FutureLab team member summarized the way a collaboration can evolve over time: "Maybe our artistic focus is not a major initial attraction for our partners, but it's a big advantage if the artistic vision can be balanced with end results." Indeed, Stephan said that once FACC confirms everything with its client, he would even consider having the FutureLab bring an artist-in-residence to work on the existing customer design of the Arsbox project.

Stephan agreed that the opportunity to make connections through the larger AEC network of partners is one of the perks of collaboration with the FutureLab: "Even if other companies have nothing to do with our business, it's always good to be exposed to other industries since there are

a lot of good ideas out there." As companies constantly seek ways to cultivate business opportunities, the FutureLab is well poised to present those opportunities. Stephan's openness to extending the collaboration in different directions has been "part of FACC strategy to reach our revenue target, i.e. working with innovative partner companies and vendors like the FutureLab. The simple reason is that it's much easier to grow via partnerships." While FACC recognizes the possibility to take advantage of networking opportunities with other Ars Electronica partners, Stephan does not seem to be fully aware of the kinds of connections that can be made via Ars Electronica.

For the FACC, the FutureLab is first and foremost a desirable business partner. FACC shareholders are representatives from some of largest Austrian companies, including the head of Landesbank, a leading bank in Linz. According to Stephan, "Our shareholders were making a push to do more electronic stuff, so they fully endorsed our collaboration with Ars Electronica and the FutureLab... In Linz, the universities seem to focus quite heavily on electronic business. I think there's an important effort on the part of the public sector to make Linz a more important center for arts and business." Naturally government officials and industry leaders want to keep things regional, but on the other hand, "If we can't realize a clear benefit, then we cooperate in R&D elsewhere... We always pursue relations where we can get the best fit for our company." Stephan confessed that, generally speaking, he views Linz primarily as a business town. "It's not a destination for me. For example, I would probably choose to travel to Vienna or Munich, rather than Linz, to visit a museum."

Stephan stated the potential for the FutureLab to create a more significant business with the Arsbox. "I've been saying to the people there that if they're doing this so well, then maybe they should look for other customers... It seems to me that the FutureLab is not really strong in selling its capabilities to the outside world, nor is Ars Electronica for that matter." Stephan does

not perceive the potential conflict of interest if the FutureLab were to focus heavily on commercial contracts, the extreme measure being the creation of a spin off company. AEC management and FutureLab staff have already ruled out the spin-off option. For the time being, the FutureLab has plenty of work in the pipeline. Stephan also perhaps does not fully realize the extent to which the AEC venue has been an excellent marketing vehicle for the FutureLab to start reaching out to a wider public. In fact, more formal marketing strategies up to this point would have been unfeasible in the sense that the small lab has only been equipped to handle a certain amount of work. Kepler University and the AEC thus far have provided primary promotional support for FutureLab activities.

3.5 Evolving Collaboration Strategies: SAP & Beyond

Ars Electronica never had a formal strategy for attracting corporate partners. The ORF and the City of Linz provided connections to the first important corporate partners. The as reputation of Ars Electronica grew, many businesses sought out affiliation given the uniqueness of the institution. Between these two phenomena, a detailed strategy has been unnecessary:

> *We're in a very lucky situation because we have the topic that many companies are still interested in, especially companies from the new economy.*
>
> Ursula Kürmayr

Ars Electronica is poised to finally devise a strategy. It is the right time not only because reduced public funding has created an incentive but also because AEC activities have become more complex—from the expanding annual Festival program to increasing project portfolio at the FutureLab and special events at the Museum throughout the year. Administratively, it would be much easier for AEC management to deal with longer-term partnerships. The strategy will, of course, continue to involve emphasizing Ars Electronica's technology focus. Even though the

AEC and the FutureLab have had a relatively easy time with corporate sponsorship controversies relative to other companies,[91] they will still need to work with companies on managing the promotion campaigns to effectively communicate the mutual strategy underlying partnership.

Until now, Ars Electronica has negotiated most deals with the marketing division of sponsoring companies for support of the Festival, Prix and Museum programs. Stocker commented on the general difficulty of maintaining relationships. "The most important thing has always been to find the right person in the marketing or advertising department at the company and if they believed in our vision, then we could make a deal. But this is generally a temporary thing because the lifespan of any marketing or advertising manager is quite short. Either they get promoted out of the position or get fired if they are not effective." The same could be said from the corporate perspective, as public relations and corporate development departments of cultural institutions also have high turnover. The AEC is an exception to this rule. The marketing director of the local ORF studio ceded Ars Electronica marketing responsibilities to his successor soon after the Museum was built. Kürmayr has overseen the evolution of the public

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[91] Based on my working experience on p.r. for cultural programming at Philip Morris (PM), the situation is much more complex with multinationals like PM, one of the earliest companies to promote arts sponsorship as big business. PM is a favorite example of a controversial corporate sponsor given its line of business. PM recently renamed itself Altria in a strategic corporate affairs move toward disassociating itself with the negative image of the tobacco industry. One media artist, Paul Kaiser, refused to directly associate himself with the recent exhibition *BitStreams* (Whitney Museum, New York, 2000) since he was so opposed to PM becoming the lead sponsor at the last minute. In a nudge to Duchamps, Kaiser reacted by signing his work in the show 'P. Mutt,' i.e. rather than use his own name. While I can understand the artist's personal feelings in this case, PM funding of the arts in my view is "legitimate" compared to other recent corporate sponsorship cases that were much more problematic given blatant commercialism (e.g. Giorgio Armani exhibition at the Guggenheim, New York, also in 2000). In other words, PM generally speaking has a very clear corporate affairs strategy that includes well-defined sponsorship objectives for supporting the arts in order to give back to the community. On one hand, it was a bit surprising that PM chose to fund that particular exhibition given *BitStreams*' focus on technology, which is outside of its core giving areas, but it perhaps indicates the company's continually progressive approach to arts funding.

Closer study is needed of trends in the convergence between museum and corporate interests. For example corporate-funded exhibitions (e.g. Armani and others shown at the Guggenheim international franchise) could be compared to corporate-funded museums (e.g. ICC, Tokyo), noting the issues and nuances relative to the type of exhibition and type of corporation (e.g. technology vs. garment industry). See Mark Rectanus' *Culture Incorporated* (2002) for more on museums & corporate sponsorships.

relations/fundraising function during some of the institution's most difficult fiscal years, as well as busiest period in terms of the programmatic expansion of the Festival, intensification of the DE activities and ventures into new and more complex corporate partnerships across at AEC divisions. Just as the staff in the FutureLab is stretched thin, so too are Kürmayr and the rest of AEC management. This is not, however, a unique situation for a nonprofit institution.

Ars Electronica still welcomes traditional sponsorships. Basic financial contributions help cover operational costs. More importantly high profile sponsors, like Telekom Austria, continue to lend important in-kind support, access to core constituents, and overall credibility through association. However, for Kürmayr, sponsorships are never balanced. "If we need a sponsor to realize some projects, we can't possibly equalize the money a company gives with any promotion. And if we could do that, then of course we would not need their money... So without being able to put a price tag on the value of networking at one of our events, for example, the AEC benefits much more from this money that the sponsor does." As a supplement to sponsorships, AEC management is eager to cultivate opportunities for two-way exchange. The idea is to transfer some know-how back to corporate partners and discover interesting new synergies through mutual exchange.

In order to streamline program administration and maximize outcomes for all parties, Ars Electronica is interested in working with the corporate affairs departments of partners since it is the job of these departments to take the longer-term view in any business relations. As Kürmayr explained, "Our focus over the next few years will be on cultivating meaningful corporate partnerships. We want to collaborate with companies on special projects, for example, create project packages whereby the sponsor would fund the Ars Electronica Festival, provide equipment, and also work collaboratively on building a special project, such as some of the those underway at the FutureLab.... Of course, as always, it will be important that our images fit

together and, if it gets to that point, that the overall advertising and marketing campaign if the company fits."

Another objective is to create a formal artist-in-residence program which would be best sustained by partners with significant financial resources. The main issue until now has been how to find the level of funding necessary to create technology-based projects. Stocker explained, "I was so close to making something happen in 1999, but then the government changed and all the hopes evaporated." The AEC recently received a small grant from Siemens to fund the artist who created the centerpiece project for the 'Hidden Worlds' that debuted at the 2002 Festival. The AEC also recently became a member of the European residency program Pepinière, a kind of clearing house that places artists at member institutions. Pepinière pays the honorarium and AEC pays housing and project fees. Otherwise, AEC residencies happen on a more or less ad hoc basis.

In the beginning, the AEC was working with a mix of multinational, European and national companies. Since the building of the Museum, the focus has shifted to more European and national, especially regional companies, e.g. those who commissioned CAVE projects from the FutureLab. While AEC management wants to further cultivate those relationships, it also wants to turn attention back toward multinationals since they have more significant resources (human, financial, in-kind) in order to build long-term collaborations.

The AEC found an ideal partner in German-based multinational SAP, the world's leading provider of enterprise software solutions. In 2002, Ars Electronica confirmed its largest single financial contribution in the organization's history from SAP. The company was extremely interested in establishing a long-term partnership. The first step of the collaboration included the organization of a major public art interactive installation by media art Raphael-Lozano Hemmer's 'Body Movies.' The project was stage in September 2002 at SAPPHIRE, SAP's most important annual business convention, and a few days later during the Ars Electronica Festival. The project

inaugurated a collaboration dubbed 'AR&D—The New Art Node.' Through this Artistic Research & Development program, the partners intend to organize an ongoing series of exhibitions of new media art developed using SAP software. The AEC's promotional brochure describes AR&D as an artist-in-residence program designed with "basic research in the arts and younger artists in mind, a strong theoretical basis, ongoing reflection, and accompanying publications." With the same contribution, SAP became commissioner and sponsor of the entire 'Hidden Worlds' exhibition unveiled at the AEC Museum at the 2002 Festival.

Overall, SAP anticipated getting significant return on investment since it would be able to access the wide resources and opportunities available at Ars Electronica. SAP executives believe that they found a good match. An SAP press release announcing the general partnership prominently highlights "The three pillars of SAP's corporate citizenship activities: creativity, diversity, and commitment." SAP was impressed with Ars Electronica's track record for creating quality programs, specifically its long-term commitment to its mission to educate the public about the future of technology. SAP CEO Henning Kagermann is quoted as saying:

> *More than just an agreement between a company and a cultural institution, we see this partnership as a prototype for a new form of artistic, technological, and social cooperation.*
>
> Henning Kagermann, CEO, SAP

Likewise, SAP presents Ars Electronica with a refreshing new opportunity since, as Kürmayr said, "SAP is interested in content," and not only in self-promotion, e.g. logo placement, as through basic sponsorship.

In addition to these activities driven by SAP corporate affairs, an SAP corporate research department began negotiations with the FutureLab to devise a plan for a separate project collaboration, possibly for the Arsbox, centering on unconventional usage of SAP software

Hörtner said it might involve working with SAP usability engineers to create networked projects and entirely new concepts for interactions with the company's database design. As is always the case, the FutureLab was aiming to identify a very specific new research problem to initiate such a collaboration, the goal being to stimulate mutually beneficial results.

> *Our objective on any project is always to do research that will hopefully yield interesting results, both for us and for the client.*
>
> Dietmar Offenhuber

Working with SAP represents a significant opportunity for the FutureLab. However, Hörtner emphasized that SAP was just one of the myriad prospective projects in the pipeline for the Arsbox. In this way, the FutureLab is approaching the situation in a practical, business-like fashion, considering first whether or not the project would yield the best return on investment.

With a long list of research projects already under its belt, the FutureLab has proven it has a working model for effective collaboration with industry which AEC management is looking to leverage. Addressing complex technical issues and devising interesting new solutions necessitates an intensive research process. Good communication within a research team is vital. Through its research lab has developed a good system of project management and communication that AEC could adopt in its dealing with longer-term partnerships with companies like SAP.

As of spring 2003, AEC management was preparing to launch the first ever public relations campaign to promote the activities of the FutureLab to wider audiences, leading up to the next Festival. The campaign is also being launched on-site as the FutureLab prepares a special installation for the AEC Museum giving an overview of its portfolio of projects. They already have a momentum going with 'Pixelspaces' and 'OpenLab.' Part of the plan is to make the FutureLab into one of the most important R&D centers in Europe within its areas of expertise. This reaches beyond the realm of the FutureLab's peer network of new media art institutions. In

other words, the FutureLab aims to compete with any comparable European applied research centers including those in university and corporate settings.

Lab staff is eager to work with AEC management to make their work more visible to the public. Opinions vary on the exact way the FutureLab should be positioned in the promotional campaign. Many focus on the importance of conveying the lab as a specialized research center that knows how to handle intensive R&D activities. There is also a sense that, in order to continue delivering quality services, the lab should be selective in negotiating new contracts:

> *We need to better define and promote our image as a think tank for cutting-edge development work*

> *Whatever we do, we need to make sure any efforts to bring in new clients are subtle—in other words, the FutureLab is an innovative think tank with an ability to choose its own customers.*

Others agree on cultivating long-term collaborations with multinationals:

> *We need to develop more corporate ties, especially international collaborations. This is important especially since in Austria, there are no real industries in VR.*

The FutureLab is already becoming increasingly visible to the corporate community as a research center able to develop cutting-edge projects and custom technology solutions. As such, it is well positioned to help corporations meet their strategic business goals. As part of the AEC, it is also poised to help research partners meet possible corporate affairs objectives that might stem from research projects. Especially in the face of challenges brought about by changing economic conditions, corporations seek new ways to stimulate creativity within their own organization As it changes its funding strategy and expands its organizational mission, the AEC operates more and more like a corporation within the framework of a nonprofit institution. The FutureLab and the AEC face the challenge of remaining accountable to each corporate partner, i.e. dedicating sufficient resources to new collaborative projects in order to satisfy partner expectations.

Conclusion

The Ars Electronica FutureLab has evolved into a thriving and increasingly more distinct division of the Ars Electronica Center. The lab was fortunate to hit the ground running with a talented team of experts and the backing of an internationally renowned cultural institution. AEC management and the public sector supporters understood the importance of nurturing the activities of an in-house R&D facility in order to animate the AEC Museum of the Future, the permanent public face of the organization. Ironically, its position within a nonprofit organization has facilitated the team's work with private sector partners on more commercially oriented projects. Without the pressure of having to turn a profit, the lab has been able to focus primarily on sustaining dynamic collaborations. Research affiliates at the local university serve as the intermediary to interesting new corporate clients. Within this strong institutional framework, the FutureLab team has developed a unique research model which allows them to experiment with technology development that feeds into project work for both the Museum and external partners.

Maintaining such diverse activities is not an easy task. The Arsbox virtual reality system represents both the fruits and consequences of the FutureLab's hard work in pushing the limits of technology development. A very real potential for burnout exists as project loads increase in number and complexity while human resources remain constant. Employees decide to stay mostly given the exciting and unparalleled opportunities available to them at the FutureLab as part of the AEC. They are also attracted to the unstructured work environment. The lab operates by and large through unwritten rules. However, management has felt it important to create some new organizational structures of late in order to ensure more efficient project management and, in turn, alleviate some of the pressure on staff.

In many ways, these organizational challenges are not unique to the FutureLab. A fundamental tension exists in the work environment of any interdisciplinary research organization—tension that is mostly stimulating but can be stressful. At the level of the individual, employees in interdisciplinary labs are constantly engaged in addressing problems from multiple perspectives. At the group level, project management teams (consisting of lab staff and external collaborators) are continually evolving. Therefore, in addition to adapting to each new research problem, team members are required to adapt to each new project team. At the level of the lab, the entire staff needs to be aware of the totality of projects underway at any given time and execute each project within deadlines so as to maintain the fluidity of the overall workload. While an issue in any work environment, this situation is more complex in an interdisciplinary research site as the nature and pace of projects tends to differ more greatly from client to client.

AEC management can help the FutureLab with organizational challenges by nurturing and leveraging the FutureLab's working model for collaboration with corporate partners. R&D projects require that good lines of communication be maintained in order to meet project outcomes and maximize return on investment. AEC management is increasingly conscious of these same goals as public sector support for arts/culture gradually decreases. The organization is looking to fortify its overall funding structure, moving beyond corporate sponsorships and rather creating richer, mutually beneficial exchanges of human, technical and financial resources through projects with private sector partners. The focus will be on multinational companies (especially high-tech companies) since they are more likely not only to have these resources available but more importantly, to be interested in co-developing projects based on corporate research and corporate affairs strategies.

This kind of collaboration strategy stands to help each partner better fulfill its basic mission. For the AEC, it would allow the organization to mediate public interaction with the

latest technologies potentially at a faster pace, thus reinforcing the position of Ars Electronica as an institution on the cutting-edge of digital culture. Another result of this could be that the general public will have a more favorable attitude toward the corporate partners who are co-developers on new projects versus those who just place their logo on Festival programs. For the FutureLab, staff would be able to do technology development work with state-of-the-art tools and platforms through the support of corporate partners. Although the pace of development work would not necessarily change (and might even intensify), companies would likely dedicate significant human resources to such projects to help balance the load. Likewise, working with any given partner over a longer term would also make moving from project to project much easier. This has already been proven in the case of the FutureLab's series of projects in augmented reality application development with Siemens. Corporations, on the other hand, would be able to take advantage of the FutureLab's research expertise to test out possible commercial applications of new technologies that the corporate R&D lab might not have developed on its own. The Siemens example also proves this point and the FutureLab's proposed software development project with SAP has the potential to do the same.

AEC management could take various steps to ensure the effectiveness and sustainability of its overall collaboration strategy. The sustainability of the FutureLab itself is of course key to this strategy. One of the most important steps will therefore be to carefully consider the suggestions of lab staff for devising a workable strategy so that they remain onboard and participate in shaping the next phase of Ars Electronica history. In addition to clear internal communications, the AEC will also have to work closely with corporate partners on devising a common media strategy. This will boost visibility for each partner's innovative activities and could possibly even attract other corporate partners to the AEC. At the same time, the media campaign could curtail any possible public misconceptions about the intentions of partnership. AEC and SAP seem to have gotten off to a good start with an effective media plan for their new

partnership. The institution will have to address IP issues which will inevitably result from more commercial projects. Perhaps the FutureLab could work with its university research affiliate to negotiate patent filings in a way that would satisfy both AEC and corporate partner interests. When these issues can be resolved, the FutureLab's unique research model can also perhaps serve as a framework for other interdisciplinary research programs within cultural institutions to experiment with corporate collaborations.

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Appendix I: FutureLab Artistic VR Projects

NOTE 1: This is only a sample of projects. See the AEC website for a complete listing. <http://www.aec.at/en/archives/pp_center_inst_chronolog.asp>

NOTE 2: The FutureLab provided development support for all artists-in-residences listed.

1996

- **Greek Temple** (*by the FutureLab, in cooperation with the Foundation of the Hellenic World*)
  The architecture of Antiquity brought to life in a Greek council building (Bouleuterion of Miletus) restored in a manner faithful to the original.

1997

- **World Skin** (*by Maurice Benayoun with Jean-Baptiste Barrière*)
  A "photographic safari into the land of war" where visitors armed with a camera and playing the role of a war correspondent can wander through a world scarred by death–one populated by human casualties and destroyed buildings.

1998

- **Mitologies** (*by Hisham Bizri*)
  A potentially endless labyrinth that is dense with allusions, a hallucinatory landscape that leads ultimately to a mosque which, to the musical accompaniment of Wagner, opens up into the caverns from Dante's "Inferno".

1999

- **CAVE** (*by Peter Kogler and Franz Pomassl*)
  An installation that plays on the human need for orientation, calling into question the means available to determine one's position in space.

2000

- **Face à Face** (*by Louis Fleri and Catherine Ikam*)
  Enables users to get into those faces and the virtual characters behind them—VR clones based on real people, equipped with a full repertoire of human expressions.

2002

- **"Gesichtsraum"** (by Johannes Deutsch with Christopher Galbraith)
  Face space is a metaphor for the interaction with a human being and for the process of entering the universe of his/her feelings.

Appendix II: FutureLab Industry VR Projects

NOTE: This listing captures the majority of major industry examples. See the AEC website for a complete listing. <http://www.aec.at/en/archives/pp_center_inst_chronolog.asp>

- **MCE (Voest)-Turbine (1996)**
  A virtual model of a Kaplan turbine that simulates the behavior of the water flowing through the turbine making it possible to conduct elaborate simulations of currents in real time.

- **Siemens-Mobile Workshop (1997)**
  Organized for the celebration of Siemens' 150th anniversary, a networked "VR conference" of one of the world's first networked CAVE environments, making it possible to establish audio and VR contact via an ATM link between the Siemens Inter Communication Center in Berlin and the Ars Electronica Center.

- **Fronius-Industrial Welding (1997)**
  An application illustrating the usage of a high-speed video technique for research in the field of industrial welding, exhibited by the company on different fares for promotion purposes.

- **Wittman-Robots (1998)**
  A digital double of a robot unit for the robot manufacturer Wittman. Their innovative programming device has been visualized in shape of a virtual menu control in the CAVE.

- **VAI-Virtual Heavy Plate Mill (1999)**
  Another project for Voest Alpine Industrianalgenbau, presenting the operations of a heavy plate mill from any possible vantage point and in the context of its realistic surroundings.

- **SINUS Park (1999)**
  An architectural visualization of the Theodor Körner Park residential development, in collaboration with Linz developer Sinus Builders and Linz architectural firm Team M.

- **VAI-Training Simulator (2000)**
  Developed for the steel manufacturer Voest Alpine Industrieanlagenbau, a 3D rendering used for training on continuous casting plants as well for marketing/promotion purposes.

- **Siemens-Hybrex Simulator (2000)**
  As the 3D-extension of the HYBREX-Simulator by Siemens for heavy plate mills, an application that simulates the operational procedures of an actual plant facility and features a realistic setting that was presented under the name I-Wall at the market launch of the simulator at the Metals and Metallurgy 2000 trade fair in Beijing.

- **Via Donau-Inland Waterway Craft (2001)**
  A CAVE application visualizing an inland waterway craft. The application was part of a marketing campaign for a company named Via Donau.

- **I.L.V.O.-Logistics Center (2002)**
  A visualization of a large logistics center for I.L.V.O. (a joint venture of the Austrian Federal Railway and Gruppo Lucefin), presented as part of a virtual groundbreaking ceremony.

Appendix III: Useful Links

Cultural Policy

- CIRCLE (Cultural Information and Research Centres Liaison in Europe)
  http://www.circle-network.org/activity.htm
- Compendium of Cultural Policies in Europe (a site maintained by the Council of Europe)
  http://www.culturalpolicies.net
- FOKUS (Austrian Association for Cultural Economics and Policy Studies)
  http://www.t0.or.at/~fokus/welcome.htm
- MEDIACULT (International Institute for Audio-Visual Communication and Cultural Development)
  http://www.mdw.ac.at/mediacult
- Österreichische Kulturdokumentation (Non-university institute in Austria for applied cultural research and cultural documentation)
  http://www.kulturdokumentation.org/eversion/index.html

Digital Culture Networks

- ENCART (European Network for Cyber Arts)
  http://www.encart.net/
- EBN (European Cultural Backbone)
  http://ecb.t0.or.at
- Index to other organizations
  http://www.v2.nl/~andreas/links/networks.html

Private-Nonprofit Partnerships

- Association for Art and Business
  http://www.aandb.org.uk/
- Austrian Business Committee for the Arts (member of CEREC)
  http://www.iwk.at/en/iwk/default.html
- CEREC (European Committee for Business, Arts and Culture)
  http:// www.cerec.org
- IEG (US-based association providing sponsorship consulting services for corporate sponsors and recipient organizations alike)
  http://www.sponsorship.com