

Souillac II
A Conference on Art, Industry & Innovation
Final Report

Welcoming Remarks

What is the place of art in a world where technology plays the predominant role we all know so well? How to reconcile these two universes so paradoxically opposed but undeniably linked in an era where technology offers new tools for artistic creation and multiples the possibilities for its diffusion.

To ask these essential questions as we enter the next millennium and, following the logic of the Souillac Charter proposed last year, to suggest what might be possible future collaboration between the two sectors, such is the merit of the second seminar, "Art, Industry and Innovation".

As seen in the following document, the working groups met July 6th to the 17th motivated by a willingness not to have just "another seminar" but to propose concrete actions.

The Regional Council is happy to have participated in such an original event and one which sums up well the spirit of our region, half way between tradition and modernity.

Martin Malvy,
President of the Midi-Pyrénées Regional Council

The Souillac II meeting was supported by the European Commission, ISPO (DG XIII / DG III), the Arts Council of England, Bell Atlantic, the Government of Quebec's Ministry of Culture and Communications, the Canadian Embassy in Paris, the Daniel Langlois Foundation for Art, Science, and Technology, the city of Souillac and the Midi-Pyrénées Region. We wish here to express our sincere appreciation for that support.

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Building on the Charter*

The second meeting in Souillac held in the summer of 1998 from July 6th to 17th produced a number of specific projects or project ideas following up on elements of the Souillac Charter for Art and Industry written the year before. The Charter can be seen in French and in English at the addresses listed below.

While all the projects are interrelated they are presented here as a series of detached documents corresponding to the categories established in the preliminary report and listed below. Some of the projects found form during our meeting, others have been developed further since. Still others have to be further refined. All of them demand an enormous amount of work. In some cases preliminary funding to begin that work has already been identified. For others, the search has just begun.

1 Innovation Exchange Workshops

2 High Band-Width Network for Artistic Experimentation

3 The Navihedron

4 Artists Rights in the New Communication Space - Survey

5 Interactivity and Pedagogical Tools :

- **Build clear educational projects**
- **Organise an International Technology Observatory, a network across art / education / research / industry**
- **Organise a network of pedagogical innovation**
- **Teach teachers**
- **Develop pedagogical resources**
- **Normalise on-line translation**
- **Modify educational working methods**

6 An International Virtual Faculty on Art and Science

7 "Instrument Makers", An art exhibit

You are all, of course, invited to comment or expand on the conclusions, send additional information pertinent to the goals expressed, volunteer for any of the work proposed, help find funding to reach the various stages indicated or pass on any ideas that will further our joint efforts. We wish to thank everyone sincerely for their participation and energy in making Souillac II a success.

*

<http://mitpress.mit.edu/e-journals/Leonardo/isast/articles/souillac/lagrana.html>

<http://mitpress.mit.edu/e-journals/Leonardo/isast/articles/souillac/foresta.html>

<http://mitpress.mit.edu/e-journals/Leonardo/isast/articles/souillac/souillac.html>

<http://www.cicv.fr/CITTOY/SOULLAC/charte/char.html>

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Innovation Exchange Workshops: 1998 - 1999

This regular series of workshops brings together artists and artists' micro-enterprises with larger corporations in telecommunications, information technologies and content, to stimulate contractual and project-based co-operation. The proposal, based on the London prototype organised in May and the meeting during the second week of Souillac II, is to encourage short-term product development to long-term research, channelling the innovation flow from artists and micro-enterprises more effectively toward large corporations and to market.

In Souillac, representatives from the UK, France and the Netherlands agreed to pursue, co-ordinate and support an international programme of such meetings for 1998 - 1999, committing funds to three such meetings, one in each country, and to a common pool to assure international participation. Representatives from Spain, Germany and Canada expect to join during 1999. The conference participants highly recommended such meetings at local, national and international levels based on the following principals:

ART IS RESEARCH

Artistic experimentation is a form of research pushing the limits of any communications technology and it is important for industry to be informed of the work going on in that sphere.

ARTISTS AND ARTISTS' MICRO-ENTERPRISES

Small groups of innovative artists and engineers, communications and IT graduates, have formed and continue to form quasi- or fully-commercial associations to advance their objectives. They are essentially 'creative engineers', refuelling their creativity through artistic experimentation.

AREAS OF ACTIVITY

These small and micro-enterprises are concerned with visual / auditory perception, system architecture, interface development, algorithm development, new forms of content and use of platforms and network to support collaborative work.

AIMS OF THE WORKSHOPS

1. To provide a forum for project-based, focused discussion between artists, artists' SMEs and larger corporations in: infrastructure, equipment, software, content creation / publishing, network services and applications.
2. To provide access to new markets and to develop local-specific content, applications and platforms.
3. To generate understanding of management skills amongst creative practitioners: SMEs in digital media, interface design, application / service developers, small content creators / publishers, companies who develop products / uses for networked communications.

• Collaboration with Intermediary Partners

Souillac II confirmed the need for continuing collaboration with intermediary partners both in terms of organisation and support, and in terms of identifying relevant industry participants.

Arts Council of England
Ministries of Culture and of Education, France
Ministry of Culture, the Netherlands
International Telecommunication Union
European Commission
European Confederation of Young Entrepreneurs
CESAM, Centre d'Expertise et de Services en Applications Multimédias, Canada

SUGGESTED WORKSHOP PROGRAMME

General Topics:

Venture Capital and Culture
Artists as 'creative engineers'

Project-based:

Interactive content
Niche Applications
Software architecture
Network architecture
Human-computer interface

REPORT ON SOUILLAC II, WEEK 2

Artists presented projects and discussed them with industry participants. Industry participants noted that artists are preoccupied with similar problems as the engineers in industrial laboratories. They were seen as 'creative engineers' with equal technical skillsets as the engineer in the industry laboratory. Furthermore it was argued that artists do not necessarily start from a creative point but often from a technology-based enquiry.

Research into the oral, visual, aural and textual expression is an investigation between the scientific (linear) and the artistic (non-linear). Artists and scientists do however share the same fundamental preoccupations, although they may articulate them differently.

The results of artistic experimentation with, development of, and use of communications technologies is transferable to industry whether as short term products, network solutions or software architecture. Results may be almost immediately applicable to market, identifying trends, or otherwise have value as long-term research with a 1 - 3 year horizon.

Areas of co-operation

It was agreed that co-operation on research and development should take place in specific areas such as:

- network management
- stimulating use of band-width
- niche (interactive) applications and services to fill increasing capacity
- evolution of band-width and asymmetrical use
- switching through light
- interface and platform design
- complementary technology such as speech recognition
- software architecture, programme language

Recommendations from industry

- Industry strongly recommended greater and more diverse forms of collaboration between artists as creative engineers and research and development laboratories.
- Forums for exchange and networking were seen as imperative in order to stimulate this relationship, which was seen as essential in researching the above technical categories.
- Artists and researchers should present work at (inter)national trade fairs such as Supercom '99 and Telecom '99.

An overall conclusion was that there is an urgent need for a permanent high-bandwidth network for artistic research and several of the participants agreed to work in that direction. (see Final Report on High Band-Width Network)

INDUSTRY PARTICIPANTS

The following companies either participated in the first meeting between artists and industry in London, during Souillac II, or have expressed an interest in future participation.

Souillac II

Telefonica
Bell Atlantic
CESAM
Lucent
Eutelsat

London

BT
Mitel
Cisco
BBC
Nortel

Future participants

France Telecom
CNET
Pearson
Cable & Wireless
Nokia
IBM
Philips

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Souillac II - Final Report - 2

High Band-Width Network for Artistic Experimentation

All of the artists and institutions present during the two weeks of Souillac II expressed the need for higher band-width possibilities and for a permanent pipeline for artistic, educational and cultural experimentation. Many of the institutions and individual artists are already confronting the problem of limited band-width in their work and the need to find solutions permitting larger scale experimentation in interactive work. It was obvious in our discussions that the people present working in these related fields already have existing programmes and projects capable of testing the possibilities systems such as ATM could provide. The demand is project driven.

Since many such networks are being discussed, and built, it was decided to propose the kind of experimentation developed by the participants as the best possible way to test the potential of high band-width connections. Projects in the areas of art and education are by definition content based and the most demanding from the cultural, social and technical points of view. They are, therefore, ideal candidates for experimentation on the future use of such networks.

A specific recommendation was directed to the European Commission, DG-XIII, DG-III and ISPO regarding the EC's plan to connect universities throughout Europe with ATM. Since the kind of work presented, particularly artistic production, already exists at a considerable level, since that work is already confronted by the problems of limited band-width and since it is from several points of view the most challenging, it is natural that such a programme of connecting centres start with what is already happening. These existing programmes and projects are sometimes associated with university departments, art schools or other administrative systems, but many exist independently which should also be included. It would be faster and more efficient to start where there is an existing demand rather than generally connecting institutions in hope of results.

Art schools, universities, research centres, individual artists, industrial groups all agreed to pursue the idea further, tracing a line from the US west coast, through the east coast, Canada, across the Atlantic to France, Germany, the UK, the Netherlands and Spain as the first steps in building the art and education pipeline. The list below is far from exhaustive and represents only those who were directly or indirectly interested in the Souillac initiative. A further effort to identify interested people and institutions would easily double the number on both sides of the Atlantic.

The next step is to identify individuals who would be willing to act as country or regional co-ordinators working to put in place their part of the pipeline and inform everyone of what is already happening. Second, a call should be made to other institutions, centres, schools and groups interested in participating. Third, a list of interested industrial partners should be drawn up such as that started here. Fourth, a technical inventory is necessary to determine what connections already exist, how to have access to them, what projects are in the offing, and how they could be co-ordinated. Finally, an inventory of art, educational and cultural projects should be compiled to demonstrate more clearly the need for this technical support.

During the meeting between artists and representatives of industry the second week of Souillac II the artists presented several projects either completed or in production, demonstrating the kind of work being done and the different directions being pursued (see Souillac Final Report - 1,

Innovation Exchange Workshops). The group also discussed several criteria for identifying the kind of artistic, educational and cultural projects to be proposed and eventually showcased. Ideally, work should involve one or more of the following:

1. technical development and innovation
2. interesting partnerships
3. development of new "languages" in the widest sense
4. be considered a prototype
5. be seen in public spaces, i.e. museums, etc.
6. be highly legible - visible
7. be user conscious

It is possible that a project inventory and the list of interested institutions could be organised by using the Navihedron model developed during the Souillac meeting (see Final Report - 3). That information could be fed in to the various meetings being prepared between artists and industry proposed in part 1 of the Souillac II final report. The following have confirmed their interest in the high band-width network either during Souillac II or since:

Interested Institutions & Individuals:

San Diego Supercomputer Center, Univ. of California at San Diego, San Diego, Cal., USA
Contact: Rand Steiger, Professor

University of Southern California, Los Angeles, Cal., USA
Contact: Vibeke Sorensen, Professor

Columbia University, Institute for Learning Technologies, New York, NY, USA
Contact: Robert McClintock, Director

Young McDonald's Farm, Dover Plains, NY, USA
Contact: Daniel P. McVeigh, Director

School of Visual Arts, New York, NY, USA
Contact: John Simon, Professor

Daniel Langlois Foundation, Montreal, Canada
Contact: Jean Gagnon, Program Director

Music Technology Area, Music Faculty, McGill University, Montreal, Canada
Contact: Zack Settel, Chair

Laboratoire de Museographie, Ecole de Design Industriel, University of Montreal, Montreal, Canada
Contact: Luc Courchesne, Professor

Société des Arts Technologiques, Montreal, Canada
Contact: Monique Savoie, Director

McLuhan Centre, University of Ontario, Toronto, Canada
Contact: Derrick de Kerckhove, Director

Laboratoire de Langage Electronique, Paris, France
Contact: Don Foresta, President

Cité des Sciences et de l'Industrie, La Villette, Paris, France
Contact: Emma Abadi, Head of Artistic Programmes

Ecole Nationale d'Arts, Cergy, France
Contact: Marc Partouche, Director

Ecole Européenne Supérieure des Arts et Technologie de l'Image, Angoulême, France
Contact: Sally Jane Norman, Director

Ecole Nationale des Beaux Arts, Nancy, France
Contact: Samuel Bianchini, Professor

Ecole Régionale des Beaux Arts, Nantes, France
Contact: Georges-Albert Kisfaludi, Professor

Ecole des Arts Décoratifs, Strasbourg, France
Contact: Eleonore Rueff, Professor

Centre National de Création Musical, Montluçon, France
Contact: Luc Martinez, Project Director

Sophia Antipolis Foundation, Sophia Antipolis, France
Contact: Anne Chambrillon, Assistant to the Director

Centre Interational de Création vidéo, Montbéliard, France
Contact: Pierre Bongiovanni, Director

Society for Old and New Media, Amsterdam, Netherlands
Contact: Marleen Stikker, Director

V2 Organisation, Rotterdam, Netherlands
Contact: Alex Adriaansens, Director

V2 Lab, Rotterdam, Netherlands
Contact: Anne Nigten, Director

Museo Internacional de Electrografia (MIDE), Cuenca, Spain
Contact: Jose Ramon Alcala, Director

Art House, Dublin, Ireland
Contact: Aoibheann Gibbons, Executive Director

Wimbledon School of Art, Wimbledon, UK
Contact: Tessa Elliott, Senior Research Fellow

Science Museum, London, UK
Contact: Hannah Redler, New Media Art Commissions

GAP-2001, London, UK
Contact: Norman Lewis, Director

Institute of Visual Media, ZKM, Karlsruhe, Germany
Contact: Jeffrey Shaw, Director

CyberCinema, European Audiovisual Center, Babelsberg, Germany
Contact: Wieland Schulz-Keil, Director

Academy for Art and Media, Cologne, Germany
Contact: Bernd Kracke, Professor

Media Arts Research Studies, Institute for Media Communication
German National Research Center for Information Technology, Sankt Augustin, Germany
Contact: Monika Fleishmann, Artistic Director

The Bonn Development Workshop for Computermedia, Animax (BEC), Bonn - Bad Godesberg, Germany
Contact: Bodo Lensch, Director

International Center for Art and New Technologies, Prague, Czech Rep.
Contact: Pavel Smetana, Director

C3 Center for Culture & Communication, Budapest, Hungary
Contact: Miklos Peternak, Director

Interested Industrial Groups:

Bell Atlantic, New York, USA
Contact: Steve Kohn, Director, Educational Initiatives/Strategic Alliances

CESAM, Centre d'Expertise et de Services en Application Multimédias, Montreal, Canada
Contact: Louise Perras, Director

CréaNET, CNET, Paris, France
Contact: Pierre Musso, Director

EUTELSAT, European Telecommunication Satellite Organisation, Paris, France
Contact: Michael Gordon, Business Planning Manager

TELEFONICA, Foundation for Art & Technology
Contact: Roberto Velázquez, Director

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The Navihedron (NAVIGATION by polyHEDRON)

The Navihedron, developed by Roy Stringer and AMAZE (Liverpool, UK), is a non-hierarchical information architecture tool allowing intuitive navigation of the network space. It presents the visitor with the fastest route to the most interesting information. Further navigation around a site is helped by arranging the selected node to link it thematically to five points - the most relevant five next to the one chosen (www.amaze.co.uk). A model for the interactive art and education network was developed during Souillac II allowing the network participant or visitor to subjectively approach the information titles presented here below for a better understanding of what one Souillac participant called the 'digital culture landscape'.

When completed this tool will allow participants of the 'Souillac Network' to post information on relevant art projects, educational programmes, research, events, pertinent information in many categories, on-line collaboration, and partnerships. It will be an open platform for expansion to interested future participants.

The model has been modified since Souillac to expand its possibilities, adding categories and enlarging others to better serve the needs described by all the working groups during both weeks of Souillac II.

The overall goals remain:

- to promote artistic experimentation and collaboration in all forms of interactive art,
- to expand co-operation between art and industry,
- in the field of education, to examine the network as a pedagogical subject,
- also in the field of education, to develop its potential as an educational tool.

Any further suggestions on how the Navihedron might be improved are appreciated. It can be seen at <http://www.amaze.co.uk/souillac/>

The necessary effort needed now is two-fold:

1. to design and complete the graphic interface of the Navihedron,
2. gather and install the necessary information for each of the categories.

That work can be on-going, but should be divided among those partners interested in one or another aspect. Any institution already working on any element or interested in taking on an aspect of the work needed is invited to let us know.

Estimated Budget, 1 year:

Finish Construction of Navihedron	10 000 ECU
Graphic interface	25 000 ECU
Developing content	50 000 ECU
Total	85 000 ECU

The categories as they now exist are:

**The Souillac Charter
for
Art & Industry**
Aims, Objectives &
Related Documents

Interactive Art Network:
Members; Institutions, Schools, Laboratories, Artists....

Education:
Curricula, Courses,
Programmes, Scholarships

Research:
Themes & Projects

History of Interactive Art

Bibliography

Project Workspace:
(entry through project password)

Newsletter:
Funding, Events, Conferences,
Workshops & Meetings

Discussion Groups

Public policies:
Authors' Rights, Laws,
Regulations and Conventions

Contacts with Industry:
Projects & Possibilities

**Technical Information &
Development**

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Artists' Rights in the New Communication Space

During Souillac II a discussion was held on the question of artists' rights and a presentation made by Danielle Cliche, senior researcher at ERICArt in Bonn and Stefaan Verhulst, director of the Programme in Comparative Media Law and Policy, Centre for Socio-Legal Studies, University of Oxford. The discussion included a conference call with professor Monroe Price (PCMLP - Oxford) and Mark Stephens (Stephens Innocent-London).

The following is a summary of that presentation and a proposal for approaching the question systematically and from the point of view of the artists.

Background:

Increasingly artists – visual artists, performance artists and others – are using new digital multi-media technologies to create and disseminate their work. Organisations in Europe and the United States, including cultural entities, have committed themselves to fostering an international community of artists via the Internet, providing for a digital era of creativity and innovation. How the new technology will affect the content and distribution of artists' work is still unknown, but what is clear is the following: because digital media such as CD-ROM and the Internet have made copying and adapting artists' work easier and less expensive than ever before, the relationship between the economics of creation, production, and distribution maybe radically altered. Not only artists, but authors and publishers, the music industry – all those involved in the creation and distribution of information- are concerned with this issue. Since artists are often the most fragile aspects of the creative cycle and the most vulnerable to economic abuse, special attention must be paid to the way they fare in the world of multi-media and modern technology.

Technology firms, Internet rights groups, lawyers, and government officials have raised the discussion of how to reformulate traditional copyright law to protect the rights of large scale players in the digital era. An increasing place must be found, as well, to locate the rights of artists. In addition, artists, like all creators, are consumers as well as producers of images. The new technology provides access to an extraordinary new collection of possibilities, and the danger exists that rules that guarantee exclusivity serve to inhibit creativity.

Governments have attempted to address copyright issues in a digital age domestically, such as the Working Group on Intellectual Property Rights in the US or the EU proposal attempting to harmonise aspects of rules on copyright and related rights in the Information Society. Such initiatives have addressed, for example, right holders in industry concerned about data base protection, and are built on traditional concepts of copyright law. It is now time to also address the manner in which media artists deal with the existing or new copyright regulations or issues. It would be especially important for national, regional or international bodies working on digital media and copyright law (including Commissioner Monti's new proposal) to integrate the needs of all rights holders, including artists, in their policies, if these are to survive in the future.

Against this background, the following ideas for an empirical study were proposed and endorsed by the participants of Souillac II.

Artists' Rights Issues Raised by Digital Technologies:

A legal system for protecting artists' rights in the digital era must address the following issues:

- What specific problems do multimedia and the Internet pose for artists' rights?
- Who should own the copyright for a multi-authored hypertext document?
- Should there be protections for new works created from derivative use of copyrighted material?
- What legal framework will protect artists' rights, encourage creativity, and also protect the public domain?
- What type of international copyright scheme can address both economic and moral bases of copyright law?

Proposed Methods for Protecting Artists' Rights:

Some of the following means to protect artists' rights in the digital era have been proposed, however no research has explored the relative merits or feasibility of these systems:

- Technical devices such as embedded "identifiers" within digital artworks and legislation prohibiting removal of such identifiers.
- Public relations campaigns to create a culture of respect for artists' work, and increase awareness of the need to prevent copying.
- Alternative royalty mechanisms such as taxing Internet use for all users, rather than licensing fees for only those detected users of copyrighted images.
- Improved international registration systems to facilitate copyright clearance and strengthen artists' rights collecting societies.

Proposed Methodology and Research Design:

- Provide an artist-centered survey that examines the national regimes and proposals for change across Europe and compares them to approaches being taken elsewhere, including the United States.
- Survey ways in which the critical international institutions, including the World Intellectual Property Organisation, are structured to take artists' rights into account.
- Provide a summary of codes of practices that have been suggested for artists, and a synthesis of such surveys, in terms of protective and assimilative practices of artists.
- Suggest means of encouraging a digital environment hospitable to artists' rights and needs.
- Create a Website for interaction and distribution of the information gained from executing the proposal.

Budget:

Researchers	50 000 ECU
Travel	30 000 ECU
Web Site/Diffusion/Communication	15 000 ECU
Study	30 000 ECU
General expenses	<u>10 000 ECU</u>
Total:	125 000 ECU

Partners:

Ericarts, Bonn, Germany
Programme in Comparative Media Law and Policy, Oxford University, Oxford, UK

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Education: Interactivity & Pedagogical Tools

The discussion of interactivity and pedagogical tools began with descriptions and comparisons of the situation and initiatives in different countries; projects actually existing, in the making or non-existent and therefore needed. The discussion underlined both the strong interest and the many limitations in today's context for interactivity as a pedagogical tool as well as the means to develop it. As a first step, the working group defined the objectives of this approach to education and then followed with the recommendations and proposals for projects listed below. Summarising the results of the discussion as we have, does over-generalise or overlook some of the important particularities of the projects presented.

The group was made up of designers and operators of multimedia educational projects, representatives or consultants for governmental institutions working to develop the new multimedia technologies for education (Ministries of Education, Culture...) and industrial representatives who have supported innovative projects. It also included long-distant participants on line, Robert McClintock, Director, Institute for Learning Technologies, Columbia University, New York (USA) and Teemu Leinonen, Co-ordinator, Future Learning Environment, University of Art and Design, Media Lab, Helsinki (Finland). Those interested in more information on the various projects discussed are invited to examine the Web sites at the addresses below. That list is not closed and it is hoped that it could be the beginning of a compilation of interesting sites accessible in the future through the Navihedron (see part 5). Any additions you might wish to add should be sent to the co-ordinator listed at the end of this report.

Objectives :

To develop :

- educational processes re-appropriating interactive technology by reversing the approach which starts with the tool - the exterior - by starting with content - the interior;
- processes of modelling 'virtual knowledge' to fit individual cultural or professional needs by taking into account differing cultural and professional contexts;
- collaborative pedagogical programmes favouring participation, learning and experimentation modelled on the artistic process;
- interactive cognitive processes permitting those who learn to participate in the development of the knowledge acquired.

Means :

There were two kinds of proposals made during the discussions: recommendations coming from the shared experiences of the group, and proposals for projects coming from stated needs. The projects proposed in this final report are a call to those interested to jointly pursue the development of those actions deemed necessary by the group. In some cases that means support for and participation in programmes already existing in certain countries. For

others, it will be necessary to form working groups to put into action those recommendations.

• **Build educational projects clearly proposing :**

- pedagogical forms specific to each intellectual discipline in its proper context, examples: Ocean of Know, where through telecommunications and robotics, junior high-school students studying the sea can see and act at a distance with sea creatures their actual environment; or, long-distant medical training such as tele-surgery taking place in real operating rooms;
- a return-path of information to industry, permitting it to participate in interdisciplinary exchanges, in support committees and to use curricula and information for its own educative needs;
- a method of effective evaluation throughout the development of the project.

• **Organise an International Interactive Technological Observatory in the context of art/education/research/industry :**

- as a response to the needs of specific pedagogical concepts for each discipline rather than forcing those concepts into existing technological or market solutions;
- adapting its 'virtual' nature - the network model - as the most appropriate structure for accelerating technological progress;
- to develop a view based on transdisciplinarity of the potential of the technologies in art, education and culture.

• **Organise a network of pedagogical innovation to better adapt form to content :**

- to introduce an innovation-based dynamic - where necessary through the use of outside experts until proper skill levels are reached - in the relationship between designers/architects and content creators;
- to make available production specialists serving as intermediaries between content creators and end-users;
- to make the benefits from local initiatives available to all;
- to adapt its 'virtual' nature - the network model - as the most appropriate structure for accelerating technological progress;
- to assure the presence of catalytic elements, e.g. institutions, with political, financial or others means to influence pedagogical development in an innovative way.

• **Teach teachers by :**

- bringing teachers and students to operate within the same learning dynamic and in the same environments permitting both to better understand contemporary society and the others' explicit and implicit sources of information;
- training teachers to use technology and, above all, to understand its potential through unorthodox applications or approaches, especially concerning interactive technologies and the new symbolic languages that accompany them.

• **Develop pedagogical resources :**

- that encourage learning processes closer to actual experience (e.g. how video-conferencing processes add to understanding network interactivity). In other terms, to make comprehensible the difference between providing or creating information and making it felt through interactive experimentation, example: the long-distance interactive experience of Young MacDonald's Farm where the

student choose, through captors, cameras, microphones and robots built by the students themselves, to replace the manual practices of agriculture and aquaculture with networked operations during the time they are not physically present on the farm. This example demonstrates the importance of the complementarity between the real-time communication tool and on-site experience, as well as dealing with data in virtual space, navigating the Internet, and shows the importance of the students' mastering the tools themselves and not relying on engineers.

- to understand the nature of the content of digital media so that the information and the person-to-person interactivity are not replaced by the tool and its man-machine interface. It is, therefore, important to encourage students to master the tools and understand the influence of form on content, in particular, to understand that "images" teach very little in themselves when divorced from the process of human interactivity.

- **Normalise on-line translation :**

- developing it from existing experiences and technologies;
- developing symbolic multimedia representations specific to each discipline, ideally, representations generally accepted and intuitively understood in each discipline.

- **Modify educational working methods :**

- through total immersion into the interactive tools in the classroom and other learning programmes (see Teach teachers);
- through expanding the time spent on interactive projects rather than textbook based exercises;
- through evaluating students by what they can do, rather than what they know, to evolve toward pedagogical systems adapted to revealing the creative potential of each person and to develop the faculty of adapting and appropriating the technology.

WEB sites referred to :

<http://www.amaze.co.uk/souillac/> (Navihedron)
<http://www.mlab.uiah.fi/fle> (Future Learning Environment -project, University of Helsinki)
<http://www.mlab.uiah.fi/~teemul/kopis/slide1.html> (idem, but specific info for Souillac II)
<http://www.educnet.education.fr> (French Ministry of Culture)
<http://www.fis.utoronto.ca/mcluhan> (McLuhan Program in Culture & Technology)
<http://www.music.mcgill.ca/~mcentury/souillac-links.html> (proposed by Michael Century)
<http://www.univ-paris1.fr/UFR04/benayoun> (example of a university site built by an artist)
<http://www.t0.or.at> (Public Netbase t0 Media~Space)
<http://www.zkm.de> (from this homepage, ZKM, Institute for Visual Media)
<http://www.newmediacenters.org> (New Media Centers, technological observatory, USA)
<http://www.oceanofk.org/YMFSite/html> (Young MacDonald's Farm)
<http://www.oceanofk.org/> (Ocean of Know)
<http://www.ilt.columbia.edu/> (Institute for Learning Technologies, Columbia University, USA)
<http://services.worldnet.net/ote/> (Observatoire des technologies pour l'éducation en Europe)

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An International Virtual Faculty on Art and Science

Recipe for a Virtual Faculty of Art and Science

Take the 24 most articulate, open-minded and brave scientists from all disciplines and all continents and the same for 24 artists of the same level and create a Virtual Faculty of outstanding intellectuals that dare see their work in a wider context, dare speak out clearly and yet have an outstanding status amongst their peers.

Invite them to join a Virtual Faculty where each will give one lecture every year on themes connecting their own work with a wider science/art perspective. The lectures are given via teleconferencing and are available to interested institutions and individuals all over the planet.

For instance, one day a week, say every Thursday, for the 24 weeks of the academic year, a tag team probing the same subject from two different angles will be available to the audience:

Example:

10 - 11: Scientist lecture (on-line)

11 - 12: On-line chat (text only) with scientist, open to everyone.

14 - 15: Artist lecture (on-line)

15 - 16: On-line chat (text only) with artist, open to everyone.

One benefit of this activity will be the educational and research-relevant material delivered to all interested institutions, be they in the realm of art or science or any other curiosity-driven human activity. Another benefit will be the resurrection of the intellectual, previously so apparent in the European tradition: the independent, free thinker with a wide audience of interested individuals; a highly skilled and hard-working person with a deep insight into his or her own field with a deep feeling for other intellectual walks of life.

At a manageable cost, a truly international circle of curiosity-driven minds can be established to the benefit of the many.

A Background to Virtual Faculty of Art and Science

There is general agreement that we have been living through and continue to live through a period of profound change manifest everywhere in western civilisation, socially, politically, culturally, intellectually, philosophically and psychologically. This transformation has been most apparent in the arts and the sciences of our century and it is there we must look to discover the meaning of that change and its consequences for our society. These tandem sources of knowledge have, consciously and unconsciously, been giving us clues throughout most of century as to where we are headed.

Given the great dispersion of knowledge today, the lack of links between the various kinds of information available through different approaches to understanding, a point of focus is essential to

bring unity to such a program. Such a point can be the idea of a new organisational space for western society, a space that has been the subject and object of much artistic and scientific invention since the end of the 19th century. Every society has at its core an image, an image of itself, of how it operates, of how it relates to other things around, an image which contains a schema describing the way that society functions.

It is obvious that during the course of the 20th century that schema, for western and probably world civilisation, has changed in profound and fundamental ways from the mechanical schema of the clockwork universe to something not yet fully defined. That schema is the organisational space referred to above. It is, as well, a visual space, a communication space, an imaginary space, an intuitional space, the way in which we see things operating.

By exploring art and science, separately and as an ensemble, it is perhaps possible to begin to understand that space and how it works and thereby find directions for the future evolution of our society. This is the principal objective of the faculty. Since few people are looking at this change in how reality is defined, the number of teachers and guides that can help through this exploration is limited. Many of the people are themselves unaware of the part their work plays in the overall transformation confronting us. No one is certain about the direction in which this is leading which means that by attempting to teach it, we are participating actively in the discovery of what we are looking for.

By making the most efficient use of the communications tools now available, we can bring together people from different disciplines to add their part to the overall construction of the new space and to work with students and teachers from several different academic disciplines to actually build it together.

Target:

Art schools or faculties, engineering schools, science faculties, research centres in both the arts and sciences, and many others.

Tools:

On-line video-conferencing, minimally one ISDN connection bridging interested sites with the transmitting institute, for direct presentation and discussion, Internet for chat sessions, preparation and follow-up.

Affiliated Institutions:

Mindship Copenhagen, Denmark
Mindship Intl., University of Maine, Orono, ME, USA
Leonardo, ISAST
Laboratoire de Langage Electronique, Paris, France

Project Budget:

Funding would be in two steps, the first, an initial grant to permit the preparation of a detail project and the first year's program. The second step would be to fund and execute that first year with both public and private support.

First step: (estimated budget, 85 000 ECU for one year preparation):

- Prepare the objectives
- Identify the topics
- Identify the faculty
- Identify the participating schools
- Identify support institutions
- Work out a technical audit
- Identify public, private and industrial partners
- Identify funding
- Prepare a detailed budget for year one

The critical problems here are:

1. Choosing the 48 people
2. Persuading them to participate
3. Deciding on working languages and solutions to on-line translation
4. Finding moderators for public debates
5. Counselling Faculty members about to lecture.
6. Creating a manual on delivering lectures
7. Creating a manual for institutions on how to use the VF in their activities
8. Locating physical homes for the VF
9. Finding fully compatible and transparent communication systems

Second step: (estimated annual budget, 350 000 ECU):

Operational costs for year one:

- Pedagogical Organisation
- Communications
- Equipment
- Administration
- Faculty salaries
- Administrative salaries

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"Instrument Makers", An Art Exhibit

For Building a New Space of the Imagination

One of the most enthusiastically discussed ideas during the two weeks of the Souillac meeting was the organisation of an art exhibit demonstrating the little known artists' role in the evolution of the tools of the new technologies and the impact it has had on the innovation of those technologies and on society itself.

Preliminary Project

"Instrument Makers" was proposed as an important international art exhibition, both historical and contemporary, with one of the objectives being to trace the topography of artistic activity engaged in using, developing, reappropriating and reinventing the technologies of a given period. It would attempt to show the impact of artistic practice and exploration throughout the century on the development and innovation of technique and technology and illustrate the on-going dialogue between art, science and technology. It would be a fundamental re-examination of art history, as well as the history of science, during the last one hundred years with, as background, the reinvention of the space of the imagination of western society. It would highlight the parallels existing between art and the development of different mathematical and scientific models which have radically transformed the way we conceive space and time.

The project is based on the idea of instruments, either of artists or engineers, or both, which have had the singular effect of transforming or opening up the artistic process between one discipline and another and of promoting transdisciplinarity between art and science, creativity and technique. The exhibition will put the accent on work more transitory than fixed, defined by the process of its generation - both artistic and technical, rather than as something solid and immutable. It will underline the passage from a universe of fixed categories to a universe of moving references.

Instrument Makers: Relating Art & Technology

The exhibition should show how artists - by assimilating and mastering, then rerouting technologies - have contributed and continue to contribute to technical progress and the evolution of the tools and expand their potential. This aspect should be of particular concern to industry but is often unknown to it. One of the fundamental objectives of the exhibition is to present this artistic demarche, becoming more and more evident today but whose roots run throughout the 20th century.

In its historical dimension the exhibition should take into account the aspirations of cinema and the electromechanical recording of sound and voice. Furthermore, electricity - the domestication of the electron - seems to be at the heart of a paradigm change in constructing art history for the last one hundred years. The application of electrical, electronic and digital technologies to artistic ends has grown with the advancement of the 20th century, and the passage from analogue to digital points to one of the key ideas of McLuhan. He saw that passage, starting from the predominance of vision in the perception and conception of the universe - first in the invention of the phonetic alphabet, then the movable type of

the Gutenberg press, up to electricity and the media growing from it - as a new synthesis in relationships, favouring a mix of disciplines and the meshing of technologies by the artist.

Instrument Makers: Relating Art to Art

The exhibition should show how, with the arrival of digital technologies in the service of all forms of creativity, artists have overcome the barriers existing between different forms of artistic expression and fuse them in the process of making a work. The appearance of the notion of space-time in our civilisation has provoked and accelerated the synthesis between the arts, plastic arts and performing arts. The new technologies have encouraged that synthesis in a more direct manner, freeing art from older forms.

Just as there exists in music an obvious relation between the instrument and the sound produced, a new relation has developed at the end of this century in the visual field in the production and creation of images. Just as new tools allow composers and musicians to model sound objects the way clay was modelled in making sculpture, in visual creation they permit the artist to conceive an image as something not fixed but as part of a process which converges toward the development of new visual languages.

Instrument Makers: Relating Art & Science

The exhibition will attempt to show how certain artistic experimentation posed the same questions as parallel developments in 20th century science.

During the period covered by the exhibition, artists and scientists in parallel have participated in the invention of a new space of the imagination whose characteristics are very different from the mechanical space inherited from the first Renaissance: a space still not fully defined, but clearly interactive, which proposes relations of a different order, at once conceptual as well as practical, between individuals and between people and their environment, both natural and artificial. The view of the artist as researcher, similar to the scientist - a researcher into the sense of things, expands the role of the artist - art as research.

Instrument Makers: Relating Art/Science/Technology - Society

The exhibition will attempt to show that certain values implicit in the work of artists, with parallels in science, for example interactivity and transdisciplinarity, can generate new organisational structures, both social and intellectual.

Through the work of artists in our era, as with a majority of scientific propositions, we are confronted by new metaphors, new relationships. The concept of the interactive network and the new space of communication is becoming the metaphor for our civilisation and its geometry the geometry of our imagination. These changes correspond to an epistemological shift in the concept of space and time, and among the repercussions is the emerging technological infrastructure of telecommunications which pushes us more and more into a universe where time and space have become mutable entities. These technologies have today, and will undoubtedly have even more so in the future, a profound impact on the functioning of our society, and because they are technologies of communication, they are the means by which we manifest our culture. The electronic media have intervened in the structure of the human senses and the function of art and artists is to give witness to the resulting disruption.

Given that, and in particular the extreme newness of the information society - the world of new media and telecommunications - artistic and in general human awareness must rise to the occasion and start drawing the first road maps of that new territory. Marshall McLuhan wrote already in 1964 that the role of the "artist is indispensable to the orientation, analysis and comprehension of the form and structure created by the technology of electricity."*

The exhibition will call on those artists who have both modified our vision of the world as well reconstructed the tools of artistic expression: as reference, the chain of inventors from Marcel Duchamp to Nam June Paik, with Man Ray and Moholy-Nagy, Takis, Woody and Steina Vasulka, Norman White, etc.; in the field of music, innovators such as Scriabine, Varèse, Cage, Moog; and in the reinvention of the space of dance, Wigman, Graham, Nicolais, Cunningham... Other art forms have also worked in the same perspective and newer generations of artists, through their mastering of science and technology, are accelerating this process of transformation and innovation.

The exhibition, planned for 2002, will be above all an exhibit of artistic work and performance and will include an important section of historical and contemporary documentation.

The preparation will take one year completing the following stages:

- Production of the exhibition concept with an historical text and bibliography
- Selecting the teams, (scientific and artistic committees), deliberations and mandates
- Selection of participating museums
- Selection of historical work (preparing requests for loans)
- Selection of contemporary artists (commissions of work)
- Selection of artistic events (productions)
- Develop the budget, financial structuring, negotiation with funders and potential partners

The Daniel Langlois Foundation for Art, Science and Technology and the Sophia Antipolis Foundation have expressed their willingness to support the preparation of the exhibition by financing the preliminary stages necessary for its organisation. Jean Gagnon of the Daniel Langlois Foundation and Don Foresta are responsible for the first preliminary phase.

Leonardo/The International Society for the Arts, Sciences and Technology has expressed its interest in contributing to the exhibition, in organising workshops, meetings and conferences exploring the central themes, also in providing publication venues through Leonardo magazine, the Leonardo Book Series at MIT Press and their web sites in Europe and MIT Press. The Association is presently developing a documentation project on those artists pioneering in technological innovation.

The Smithsonian Institute in Washington and the Visual Institute of the ZKM in Karlsruhe have also expressed an interest in the exhibition.

The exhibition will be aimed at industry as well as the general public. A suggestion was made that it could be inaugurated during the ITU Telecom Interactive in Geneva and then travel throughout the world to reach larger audiences.

* Marshall McLuhan, "Understanding Media", 1964, "Pour comprendre les médias", 1968, pages 84-85.

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