The Networked Society

Cash Sponsors as of 10/15/93

*CISCO $10K

Fannie Cox Foundation $50K

*Morgridge Family Foundation $10K

Novell, Inc. $100K

Secretary of Transportation, Commonwealth of Massachusetts $100K (?)

Paul Severino $25K

Sun Microsystems, Inc. $50K

*S.W.I.F.T. $100K

Wellfleet Communications, Inc. $25K

* new since 10/15/93 $470K

NEH $50K

The Networked Society: Areas and Activities

AREA	ACTIVITIES
Introduction/ "Log in"	Presentation that introduces visitors to networks. At end of show they pick their "Network Guides"
The Telephone Network	Beyond Dial Tone: The telephone system is a computer network Bandwidth Voice Mail
The Networked Home	Two-way TV Smart doll house Networked flight simulator game
The Networked Office	Doctor Video Conference Notes: collaborative work
Finance	24-Hour speculator ATM machine
Retail/ Manufact-uring	Retailing: credit verification, inventory control, mass marketing Manufacturing plant in action
Utility	Central Artery
Privacy	Network Visit review Credit Card Reader
Learning/ Resource/ Demon-stration Area	Internet: Interesting Info UseNet groups Live chat World Wide Web Email (prez, celebrity) Video conferencing/ Networked VR Museum on-line

The Networked Society

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The Networked Society: Areas and Activities

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Gardner

This fax contains the 2-page proposal I'm sending out to Brad Barker at Stratus.

I also enclose the budget I prepared last November. The Museum requires $34,000 for the "bare bones" version, and $70,000 for the "desirable" version.

Let me know how you think we should approach the fund-raising. We should probably "make the ask" if we get a positive reaction to the ideas in the proposal.

Oliver
3/10/89

The Computer Museum

300 Congress Street
Boston, MA 02210
(617) 426-2800

PROPOSAL FOR A NEW EXHIBIT AT THE COMPUTER MUSEUM:

AUTOMATIC BANKING IN THE NETWORKED SOCIETY

The Networked Society

The Computer Museum plans to develop a major exhibit entitled "The Networked Society" in which large-scale, strategic uses of computers in selected industrial and service applications will be presented. Although almost everyone relies on these applications every day, very few understand the technology that lies behind them. A major goal of "The Networked Society" is to provide an engaging and participatory introduction to the information society, its technology, and its future potential. This will be accomplished by offering visitors an opportunity to peek behind the scenes as they try out a fully integrated set of services.

The exhibit will be a microcosm of a networked society, with a computer network connecting a diversity of interactive stations. At the start of the exhibit, visitors will enter information about themselves and be issued a card. The card will be used to activate exhibit modules on banking, telephone calling, retailing, and airline reservations. Information on the cards will include visitors' names, simulated credit, and a summary of their transactions in the exhibit. The application areas currently under consideration include:

- banking
- communications networks
- international finance
- stock market
- airline reservations
- manufacturing
- utility management
- retailing

The exhibit will include hands-on interactive stations, video, and original artifacts. Quick, rewarding "nuggets" will engage visitors, even those without prior interest in computing. Typically, these will consist of hands-on transactions for visitors, such as with an ATM, a supermarket checkout, or an airline reservation system. More detailed explanations will be presented for more demanding visitors. In addition, printed explanation sheets will be available in the gallery. Further materials will help school teachers and students to prepare for a visit to The Computer Museum, and to follow up with activities in the classroom after their visit.

The exhibit development will be directed by The Computer Museum's Curator, Dr. Oliver Strimpel in conjunction the Museum's Director of Education, Adeline Naiman. An advisory group of experts in networked computer usage, classroom teaching, and exhibit design will be convened.

The Computer Museum

300 Congress Street
Boston, MA 02210

(617) 426-2800

Automatic Banking: The ATM Module

The Computer Museum proposes to develop an exhibit module on the use of computers in automatic banking, featuring the Automatic Teller Machine, based on a fault-tolerant computing system. The Museum anticipates building this exhibit with support from Stratus Computer, Shared Financial Systems, and Diebold.

1. Visitors use a real, functioning ATM in the exhibit

Museum visitors will make use of a real ATM, using the card issued to them at the start of the exhibit. Each visitor will be given a bank account with a certain amount of "money" upon entering the exhibit. The ATM will enable visitors to withdraw "Computer Museum" cash and also check their account balances. The account balances will be affected by transactions at other exhibits within The Networked Society, including the supermarket checkout, telephone, and airline reservation modules. A real-time commentary will be provided by a second computer interfaced to the ATM. This will describe the steps carried out by the ATM's software to obtain the client's balances and validations and to activate the cash-dispensing mechanism.

2. What's on the Card?

Visitors will be invited to place their own "Computer Museum" card into a machine and see an explanation of the information and encoding scheme on the magnetic strip on the back of their card. In addition, visitors will also be able to insert other credit or cash cards they may have and obtain an description of the information stored on each one.

3. Banking by Computer

A short video program (5 minutes) will show how wide-area online banking relies on networks of computers that can exchange information rapidly. The operations of a particular bank (as yet undetermined) will be featured.

4. Fault-tolerant Computing

Online banking places great demands on the reliability of computer systems. The exhibit will include a working fault-tolerant computer that supports the operation of the ATM. The computer will have a transparent cover, with each module and its duplicate clearly labeled. A monitor will continuously display the transactions being processed, allowing visitors to track the activities of others throughout the exhibit. In addition, a short video program will explain how fault-tolerant computing works and will present glimpses of other applications that rely on fault-tolerant computers.

END

ATM Section Budget

	A	B	C	D	E
1	BARE BONES				
2			IN KIND	IN KIND	COMMENTS
3		CASH	STRATUS	OTHER	
4	concept development & research	$8,000	10 man days	5 man days	provide expertise on topic
5	design	$6,000	$8,000		Museum makes consistent; Stratus does detail
6	fabrication	$6,000	$10,000		portions fabricated at Stratus
7	graphics, audio, & video production	$5,000	$10,000		use Stratus facilites to produce media
8	ATM system hardware & software	$0	computer	ATM, software	all equipment & software to be donated
9	hardware & software for interactive element	$6,000	$0	$4,000	programmed by intern; PC donated
10	educational materials	$2,000	$6,000		in-kind covers graphic design & printing
11	public relations & promotion	$1,000	3 man days		in-kind media releases
12					
13	TOTAL	$34,000	$34,000	$4,000	
14					
15	GRAND TOTAL (CASH + IN-KIND)	$72,000			exhibit will occupy approximately 300 sq ft
16					
17	DESIRABLE		IN-KIND	IN-KIND	
18		CASH	STRATUS	OTHER	
19	concept development & research	$10,000	15 man days	10 man days	greater diversity of information researched
20	design	$8,000	$10,000		more aspects featured in exhibit
21	fabrication	$20,000	$10,000		more context, fuller exhibit "set"
22	graphics, audio, & video production	$10,000	$25,000		good quality media, professional programming
23	ATM system hardware & software	$0	computer	ATM, software	all equipment & software to be donated
24	hardware & software for interactive element	$6,000	$0	$6,000	programmed by intern; better PC graphics
25	educational materials	$6,000	$6,000		better design, color, printing in educ. materials
26	public relations & opening party	$10,000	5 man days		media releases, press party, photos, etc.
27					
28	TOTAL	$70,000	$51,000	$6,000	
29					
30	GRAND TOTAL	$127,000			exhibit will occupy approximately 500 sq ft

ATM Section Budget

	A	B	C	D	E
1	BARE BONES				
2			IN KIND	IN KIND	COMMENTS
3		CASH	STRATUS	OTHER	
4	concept development & research 8	$8,000	10 man days	5 man days	provide expertise on topic
5	design 14	$6,000	$8,000		Museum makes consistent; Stratus does detail
6	fabrication 16	$6,000	$10,000		portions fabricated at Stratus
7	graphics, audio, & video production 15	$5,000	$10,000		use Stratus facilites to produce media
8	ATM system hardware & software	$0	computer	ATM, software	all equipment & software to be donated
9	hardware & software for interactive element	$6,000	$0	$4,000	programmed by intern; PC donated
10	educational materials	$2,000	$6,000		in-kind covers graphic design & printing
11	public relations & promotion	$1,000	3 man days		in-kind media releases
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13	TOTAL	$34,000	$34,000	$4,000	
14					
15	GRAND TOTAL (CASH + IN-KIND)	$72,000			exhibit will occupy approximately 300 sq ft
16					
17	DESIRABLE		IN-KIND	IN-KIND	
18		CASH	STRATUS	OTHER	
19	concept development & research 10K	$10,000	15 man days	10 man days	greater diversity of information researched
20	design 15K	$8,000	$10,000		more aspects featured in exhibit
21	fabrication 30K	$20,000	$10,000		more context, fuller exhibit "set"
22	graphics, audio, & video production 25K	$10,000	$25,000		good quality media, professional programming
23	ATM system hardware & software ~~80K~~	$0	computer	ATM, software	all equipment & software to be donated
24	hardware & software for interactive element	$6,000	$0	$6,000	programmed by intern; better PC graphics
25	educational materials	$6,000	$6,000		better design, color, printing in educ. materials
26	public relations & opening party	$10,000	5 man days		media releases, press party, photos, etc.
27					
28	TOTAL	$70,000	$51,000	$6,000	
29		$ 30,000 overhead			
30	GRAND TOTAL	$127,000			exhibit will occupy approximately 500 sq ft

Smithsonia $400/sq. ft.
Smart Machines $133/sq. ft.

Brad Bunker
Dick Tennelli

11/1/88

The
Computer
Museum

300 Congress Street
Boston, MA 02210
(617) 426-2800

Memo to: Joe Cashen
Irwin Sitkin
Bob Lucky
Oliver Strimpel
Gardner Hendrie

From: Gwen Bell 10/25/88

Visit to Amdahl, Oct. 20 re The Networked Society

The proposal to do a $50,000 - 200,000 "module" of the Networked Society Exhibit has been wending its way through Amdahl Computer.

Our chief advocate is Lloyd Dickman who is the CPU architect of Amdahl systems. Lloyd spent a half day at the Museum this summer coming to understand the concept and how the Museum develops exhibits. On this visit, I met with Ed Brown who manages corporate contributions under Tony Pozel. We discussed, at length, the developing the telephone application. They described the Amdahl system at AT&T that was the center of the 800 number service. The system uses UTS (Amdahl's UNIX) and has almost no IBM software, which they considered a plus. (As a second alternative they discussed something at Reuters.)

Since Oliver had been speaking with Bob Lucky and AT&T we need to explore how this idea would fly, in terms of a partnership exhibit of Amdahl/AT&T showing the 800 number telephone application.

I was then taken to meet Joe Zempke, the President and COO, who was very cordial. Apparently, the VP of Manufacturing (name I forget) recently visited the Museum and was impressed. Furthermore, Amdahl wants to raise the corporate profile as providing transaction processing machines and sees the Museum exhibit as a good positive way to accomplish this. Thus, they are not looking at our idea as only a "corporate contribution" but in the "corporate self-interest."

The timetable now is that I will get back to them the first week of December. In the meantime, we want

(1) to clarify where our proposal stands with AT&T;

(2) to continue to have help from Irwin Sitkin in encouraging Jack Lewis to support this idea.

PROPOSAL FOR A NEW EXHIBIT AT THE COMPUTER MUSEUM:

AIRLINE RESERVATIONS IN THE NETWORKED SOCIETY

The Computer Museum plans to develop a major exhibit entitled "The Networked Society" in which the large scale use of computers in a handful of key industries will be presented. The Museum proposes to develop one exhibit module on the use of computers in the travel industry, using the American Airlines SABRE system as the example.

Exhibit Content

- The exhibit will feature an impressive, large wall display of an aircraft; visitors will be able to reserve seats at a terminal and see their names appear at a seat location of their choice. This item will act as an attractive 'bait' to draw visitors to this area.

- Several hands-on interactive stations will run EAASY SABRE. Visitors will be able experience the immediate access to many of SABRE's features with an extremely friendly, easy to use interface.

- A large, lighted wall map will feature SABRE's extraordinary telecommunications capabilities. This item will be associated with the EAASY SABRE terminals. Every time a visitor presses the 'ENTER' key to select an option, data is sent to and from the computer center in Tulsa, Oklahoma. This will be simulated on the wall map with lights that flash to show how the signals travel. The display can be fairly accurate, and supporting text and graphics will explain fiber optic and satellite communications, as well as local networking. Samples of cables and fibers will be displayed.

- To convey the enormous scale of the SABRE operation, a display will show the number of messages being processed each second in real time. The load will vary during the course of the day, and from season to season. Ideally this would be accurate information, updated every few seconds by the computer center in Tulsa. Of additional interest would be the geographical spread of the message load, coinciding with office hours in the various time zones accross the world.

- An interactive demonstration of SABREVISION will provide an entertaining introduction to the scope of products that can be purchased through SABRE. The use of CD ROM to present video,

graphic and text information demonstrates a new front-end for a travel reservation system. The system is very easy to use as it is designed to be work unattended in public spaces such as shopping malls.

- The history of SABRE would be shown by presenting snapshots of the system at regular intervals from 1962 to the present. This section might be presented as a slide show. Interesting statistics would be highlighted; for example, SABRE's response time has remained at 3 seconds ever since 1962 despite a huge increase in volume. Another set of comparisons might show the amount of floor space that would have been needed to supply the computer power required by SABRE today using technology from selected dates from 1962 onwards.

- The exhibit will present a simplified picture of how the SABRE system works. The simplest way to present this would be through clear graphics, showing how the program locates information and updates its records in response to an input. Ideally, this would be presented in an animated interactive simulation, in which visitors would run through a sample reservation, and see 'behind the scenes' into the core of SABRE.

Timing and Budget

The Networked Society exhibit is expected to open during 1990, but the exhibit will start being developed as soon as funds are received, with intensive work beginning in mid-1989.

Each module of the exhibit will cost $125,000 to develop, broken down as follows:

ITEM	CASH COST ($K)	IN KIND ($K)
development & desgin	45	20
exhibit construction	25	
graphics, slides, video	20	20
exhibit hardware	15	50
shipping, contingency	10	
educational materials	10	10
TOTAL	125	100

The "in kind" column refers to the value of goods and services that will be donated to the project. The Museum has been very successful in securing donations of equipment for interactive displays as well as programming and other development effort from a wide group of enthusiastic volunteers.

OS
8/15/88

The
Computer
Museum

300 Congress Street
Boston, MA 02210

(617) 426-2800

June 24, 1988

Mr. Max D. Hopper
Senior Vice President
Information Systems
American Airlines
P.O. Box 619616, MD 4215
Dallas/Fort Worth Airport
Texas 75261-9616

Dear Max,

Thank you for arranging an excellent "field trip" to the SABRE system. Gardner Hendrie, the new Chairman of the Board, was able to join Oliver Strimpel and I, for the Dallas segment of the trip. We were all extremely impressed by the SABRE system, its size, extensiveness, and the fact that response time has stayed constant at less than 3 seconds since the outset.

Oliver is now preparing some ideas for an exhibit that he will share with you in a month's time. There are some things that will be easy to make happen, for example, since we have a donated Compuserve Line, having Eaasy Sabre available for Museum visitors should be a "lay up." Other things are going to be much more difficult, but important, in showing the public the size, extent and reliability of SABRE.

I suggested to Joe Selman that the public relations group might find a variety of anniversary dates of SABRE in late 1989 and early 1990. Tying an opening to an anniversary celebrated by the Museum always helps to bring national press.

Texas hospitality was superb. From the time Joe met us at the airport every detail was attended to extremely well. Oliver and I enjoyed the food at the Atchafalaya Cafe -- it's wonderful to taste the food of the region.

And thank you for the very special arrangements to see the center of SABRE in Tulsa; we appreciated that very much. Our understanding is much greater, and our awe of SABRE has increased a thousand fold. Please pass along the thanks to everyone who made this happen.

Sincerely,

Gwen Bell
Founding President

GB/sr

Trip Report

Oliver Strimpel
5/26/88

AT&T Bell Labs
5/23/88

I visited Bell Labs at Murray Hill, NJ with a two-fold agenda. The first and most pressing item was to see Bob Lucky, our Board member from AT&T and director of a large division within Bell Labs comprising about 500 scientists. The purpose of the meeting was to bring him up to speed on the last two Exhibits Committee meetings, get his comments and input, and then to get him involved and excited about The Networked Society exhibit. In this exhibit, we would like to base a section on how AT&T use computers to operate the world's largest network.

Bob was enthusiastic, and thought we should include something on their network operations center in Bedminster, NJ. There they have an impressive situation room where one can get an overview of the state of the phone network nationwide. He immediately pledged AT&T's support in terms of information and equipment. I said that financial support of the order of $150,000 would also be needed. He said he would initiate the process with the AT&T foundation.

In the second part of the visit, one of his researchers, Alan Huang, showed me round a part of the lab. I saw robotics, computer graphics, microscale machines (tiny tiny cogs), and many optical computing labs. They are making a lot of progress in optical computing, in which beams of laser light carry information and activate components that switch.

Of historical interest, I saw one of the old picture phones. This was an idea that failed, but should be collected. No-one really admitted to owning it, but I gave my card to the person in whose office it was. To get it, we should proably go after it agressively with Lucky.

IBM Gallery at 590 Madison Ave, NY:
Computers and Art
5/24/88

This is a large, 8,500 square feet exhibit that consists mainly of static, wall-hung art pieces. But there were several working interactive ones. Most impressive were two sound-sensitive pieces that responded to music, claps or whistles. One of these was a water fountain; the other, which consisted of about 9 vibrating poles, would be a wonderful piece for the lobby here. Richard Voss had mounted an interactive (high-powered System 2) pc that had a lot of spectacular fractal and other images on it, but they were buried behind a quite unfriendly and opaque menu. If we could get that and change the interface it would be a great improvement on the julia set exhibit we now have.

There were interactive paint systems, and a frame-grabber combined with a paint system, so that you could paint and screw around with a picture of your own face. When finished, you could get a color hard copy. I have mine in my office for anyone to see. Each one of these had a full time "explainer" on duty next to it to hold people's hands. They also had a Harold Cohen system (ported to the IBM RT) identical to ours. It too had its dedicated explainer.

The show was put together over 5 years by Cynthia Goodman, formerly at the Everson Museum of Art, and now Director of the IBM Gallery. The core of the show without the interactives (except for one or two including the one I liked for our lobby) is travelling, and could be had for $30,000. This covers crating, transport and insurance. We'd have to perform all the installation.

We should seriously consider taking this show - it is not currently planned to visit Boston. We would not have room for it all, but a deal might be struck to take part, and display it in the Norris gallery and Honeywell animal areas. Do we know any likely patrons for this project? Another alternative is to commission the person (Wen-Ying Tsai) who did the sound sculptures to do one for our lobby, and pursue other items individually. A big show would, however, be more promotable.

New York Hall of Science
5/24/88

Founded in 1986, this institution follows the Exploratorium tradition. The director, Alan Friedman, was at the Lawrence Hall of Science for many years. Located in a run-down Queens neighborhood, the Hall of Science occupies a building built for some Expo held in the 60's. They have produced about 20 individual exhibits on feedback and on the atom, including an impressive computer-driven laser projected model of a hydrogen atom. When you press a button, you 'inject energy' into the atom, and it changes shape, in accordance with quantum theory. This even got written up in the New York Times when it opened. About 80 of their 100 exhibits are on loan from IBM who in turn purchased them from the Exploratorium for an exhibition last year in the IBM gallery (in Madison Ave). Called "Seing the Light" these exhibits explain many aspects of optics in a playful hands-on way.

They plan a major new exhibit that might be entitled "What is a Germ?" and also something they call Exhibit Link which is going to be a hypercard-based explanation of their optics exhibit. This will also help link together far-flung exhibits that deal with related concepts. Exhibit Link is funded by NYNEX. They are now trying to get Apple to come in, but are cautious because they are surrounded by IBM.

They have about 100 staff, about 50 FTE's. They currently get about 250,000 visitors a year, about half being school group visits. They are about 40% funded by the city, the rest from revenue and donations. I expect they will grow quite rapidly in the years to come.

John Driscoll, one of their developers who is in charge of Exhibit Link, will visit us this summer, probably around the time of MacWorld.

END

IDEAS FOR AN EXHIBIT BASED ON AMERICAN AIRLINES' SABRE SYSTEM

The Computer Museum would like to present the application of computers in airline reservations systems as a major module within an exhibit entitled "The Networked Society". The following are some preliminary ideas as to what the exhibit might contain.

1. Interactive hands-on exhibit based on EAASY SABRE. This program is designed for use by novices working from their home. It offers schedule, fare, and dependability information as well as international weather updates.

2. Communications pathway. Every time an 'enter' key is pressed on any terminal connected to SABRE, data is sent to the computer center in Tulsa, Oklahoma. It would be interesting to present a simulation of the path of the data during a SABRE session. Ideally, this would be synchronized to an actual EAASY SABRE session, with lights showing the pathway flashing on a map indicating the data flow in real time. Static material would explain the data communication methods used, including fiber optic and satellite. Samples of the fibers and cables used should be displayed together with facts about their capacity.

3. The enormous scale of the SABRE operation should be conveyed in a vivid and immediate style. Ideally, a large display should indicate in real time the number of messages being processed every second by the system. The load will vary during the course of the day, with peak loads coinciding with the open hours of travel agents.

4. Interactive hands-on demonstration of SABREVISION. This CD ROM-based product offers short video scenes that allow potential travellers to select information about various locations. The use of the CD ROM to present video, graphic and text information is innovative, and demonstrates another front-end for a travel reservation system.

5. The history of SABRE should be shown by presenting snapshots of the system at various times. One way to present this material would be with a slide show. Interesting statistics can be shown; for example, the response time of SABRE has remained at 3 seconds since 1962, despite an enormous increase in volume.

Another sequence could show the amount of floor space that would have been needed to supply the computer power consumed by SABRE today using technology from the 1st installation in 1962, and at other selected dates.

OS
6/27/88

The Computer Museum
300 Congress Street
Boston, MA 02210
(617) 426-2800

May 26, 1994

To: Lynda Bodman: 723-4457
Richard Case: 914-766-2861
Steve Coit: 860-0524
Cliff Gerring: 261-3381
Gardner Hendrie: 367-0478
David Nelson: 508-651-0911
Kathy Rourke: 267-1862
Larry Weber: 661-0024

cc. Oliver Strimpel
Gwen Bell
David Greschler
Betsy Riggs
Gail Jennes

With the launch of the first exhibit that will thoroughly explore computer networks slightly more than five months off, The Computer Museum would like to finalize the name of the exhibit. We need a name now -- or very soon -- so that we can begin advertising, promotion, collateral, and graphic design. At this time, we ask for your input, by noon on Wednesday, June 1, on the recommendation at the conclusion of this paper.

To determine an effective name, we have conducted some informal research and taken a number of subsequent steps:

Action	Result
Informal poll of staff and advisors for name suggestions.	The Networked Society generated first. Subsequent suggestions identified "Planet" and "Earth" as alternatives to "Society".
Informal poll of staff for an appropriate sub-title or "tag line". We anticipate that the tag line will be used by the media in first references to the exhibit and by TCM in literature. We hope the tag line gives the public an added frame of reference for the exhibit.	Options generated all included "Information Highway" (IH)[1], as this term is currently hot in the media and readily identified by the general public. Options developed: "Connecting to the IH", "Traveling the IH", "Mapping the IH", and "Navigating the IH".
Formal poll of staff on the name and tag line.	All staff (in Boston) received a questionnaire asking for their preference for a name and for a tag line. By 18 to 1 to 0, the staff preferred "Planet" over "Society" and "Earth". Staff preferred "Traveling the IH" to other options, but not by a great margin.

[1] "Information Highway" currently is used most widely in the media, evidenced by several articles in *The New York Times* and *The Wall Street Journal* in the last 10 days. "Information Superhighway" was considered, but seems to less popular with the media at this time.

Guests polled on the name and tag line. After identifying their preference for a name and tag line, guests read a description of the exhibit and were asked if the name fit the description.
273 guests responded to the poll.

- Guests chose "Planet" and "Society" in equal numbers (35.71%) and preferred either option to "Earth" (28.57%).
- Guests preferred "Traveling the IH" by a margin of almost 2:1 over any other option for the tag line.
- Guests confirmed that all name options fit the written description of the exhibit.

Based on the results of our polls[2] with both guests and staff, we would like to accept the staff's strong preference for "The Networked Planet" and combine it with the guests' strong preference for "Traveling the Information Highway" resulting in:

The Networked Planet: Traveling the Information Highway

We would very much appreciate any suggestions you can provide us on the name. If I may answer any questions about our process, other names we considered, or anything else, please contact at any time.

Sincerely yours,

John A. Marchiony
Director of Marketing

phone: 617-426-2800 x396
INTERNET: marchiony@tcm.org

[2] The polls we conducted were not perfectly controlled and represent a sample only of guests who visited TCM. Note: guests were polled before visiting the exhibit floors.

SOCIETY FOR WORLDWIDE INTERBANK FINANCIAL TELECOMMUNICATION

11 February 1994
KCK/com/94

THE COMPUTER MUSEUM
To the attention of Mr Gardner C. HENDRIE
300 Congress Street
Boston, MA 02210

U.S.A.

Dear Mr Hendrie,

Thank you very much for your invitation to the Advisory Committee for the Museum's new exhibit, The Networked Society.

I read with great interest the proposal sent to the National Science Foundation and the information on the Museum. With its mission of promoting the understanding of computers world-wide, the Museum certainly fulfils an acute global need. You can count on my active support and participation in the affairs of the Museum. Given the distance and the pressure of a new job, I was not able to attend your meeting last November. I hope to participate and be useful in the Committee's future deliberations and would appreciate being kept apprised.

I am delighted that S.W.I.F.T. would be participating as a sponsor of the Exhibit on "The Network Society". David Greschler, in a memo dated November 19, 1993, had suggested that S.W.I.F.T. participate in the Financial Systems segment of the Exhibit. Global trade and financial markets require movement of huge amounts of funds every second of the year to settle millions of business commitments and trading transactions. For most of the industrialised countries, funds equivalent to the

S.W.I.F.T. s.c.
Avenue Adèle 1 - B-1310 La Hulpe - Belgium
Telephone: +32 2 655 31 11 - Telefax: +32 2 655 32 26 - SWHQ BE BB - Telex: 26532 swbru b
VAT: BE 413.330.856 - RC Nivelles: 51367

entire wealth of each nation need to move about every eight hours from one position to another. Global computer networks of utmost integrity, reliability and availability are needed to enable these movements of funds. S.W.I.F.T. being the world-wide interbank Financial Network, plays a central role in the global payment system.

S.W.I.F.T.'s Education Department has some multimedia courseware that is used in educating S.W.I.F.T.'s clients. We would be glad to share this material or assist in any way possible to make the Exhibit's Financial Systems Station highly informative.

We can also count on Laura B. Morse, in her new association with S.W.I.F.T., to facilitate the fullest possible participation of S.W.I.F.T. in the opening of The Networked Society Exhibit and SIBOS '94 this October.

I look forward to further phone discussions with you and David Greschler.

Yours Sincerely,

Kailash C. Khanna
Head of Global Information Technology

cc: Leonard H. Schrank
Francis Remacle
Laura B. Morse
David Greschler

The
Computer
Museum

300 Congress Street
Boston, MA 02210

(617) 426-2800

November 29, 1993

David Mahoney
Chair & CEO
Banyan Systems, Inc.
120 Flanders Road
Westboro, MA 01581

Dear Dave,

Thank you for meeting with David Greschler and me last week to discuss "The Networked Society," and the possibility of Banyan Systems becoming a major sponsor of this exhibit.

The first exhibit of its kind devoted entirely to computer network technology, "The Networked Society" is an opportunity to promote increased public understanding and use of computer networks. Its implementation is urgent, as this technology rapidly impacts an increasing number of people in a growing number of ways. Because of its significant presence and contributions to this area, we would like Banyan Systems to become a key sponsor of the exhibit at the $50,000+ level. I believe a partnership between Banyan and the Museum would be invaluable to the exhibit's development.

The Museum would work with Banyan to develop promotional strategies that best meet your needs. Because Banyan supports large-scale computer networks, its products would be strategically placed in exhibit areas which highlight and apply this technology. Banyan would be more prominently listed on signage in these areas, and its products would be clearly identified for visitors. In addition, Banyan would be listed in all promotional and accompanying educational materials.

In our meeting last week you mentioned your interest in personally contributing to the exhibit. In addition to your financial support, we would welcome your ideas and input as a member of the exhibit's Advisory Committee. On behalf of Gardner Hendrie, Chairman of the Advisory Committee, I extend an invitation to you to serve on the Committee. The group meets every 6 to 8 weeks to review the exhibit's development and make recommendations for changes and additions. Local members include, Gardner Hendrie, Ed Belove, Paul Severino, Howard Salwen, and Jim McKenney. Our next meeting will be held in January. We will be scheduling the meeting soon and will call to find out what dates are good for you.

Again, thank you for meeting with David and me. It is great to learn of your personal interest in this exciting project. If you have any questions about the exhibit and Banyan's participation in it, please call or e-mail me. I look forward to a favorable response to our request.

Sincerely,

Oliver Strimpel
Executive Director

AREA	SETTING	ACTIVITIES	RANK	ILLUSTRATED SIGNAGE	VIDEO PRESENTATION
Part I: Introductory Presentation	Theater	Short presentation introducing visitors to the major themes of the exhibit			
Part II: Logging In: The Networked Guides	Open Space	People will be given a bar-coded card and asked to pick their Network Guide - a video talking head who will appear at each interactive station throughout the exhibit.			
Part III: The Networked City	(Varies according to Areas)	Different settings (application areas) showing different network applications, how they work, and their impact		(Varies according to Areas)	(Varies according to Areas)
The Telephone System: It's a computer network!	Tele-phone Network Control Room	*Beyond Dial Tone: Enhanced Services* How a phone call goes through the telephone network.		•Different levels of phone lines and services.	•History/ evolution of the phone network . •The "Information Superhighway" concept.
The Networked Office	Office Space	*Collaborative Medicine* Multi-visitor activity where visitors use shared screens to complete a medical activity. *Email Follies* Multi-visitor activity where visitors work together on emails	____	• Image showing how an email message from one person reaches multiple people. This will show different network types and structures .	• How people use email and the impact it has on the way they communicate. • Does your employer have the right to read your office email?
The Networked Home cost/min x y z	Home Space cost by const picture (video) your got	*Two-Way TV?* Different applications of interactive television *Bandwidth: Picture* Visitors try different bandwidth *A "smart" doll house* Visitors control a smart house	home shopping interactive movie ____	• Image showing how a person using a PC uses a modem to make the connection to remote computers. Details how a modem works.	• Telecommuting: Visitors will listen as people talk about the ups and downs of working at home thanks to the networked computer: less travel time, less transportation pollution, more time for parenting, less peer interactions and collegial community

Retail	Retail Store	*One action, many reactions: Shopping in the Networked Society* Visitors make a purchase and see how many networks are impacted		• An integrated system: how retail is connected to manufacturing.	None
Manufacturing	Manufact-uring site	*Control a Manufacturing Plant* Visitors see the object they purchased in the retail section manufactured		•An overview of how manufacturing plants are controlled by networks: robot control, temperature control, etc.	•Computer Integrated Manufacturing (CIM)
Finance	Stock market	*24-Hour Global Speculator* Visitors buy and sell at different financial markets to see how networks are used *Collect Your Money: The Automatic Teller Machine* Visitors use an ATM to see how they work		• Banking networks (Cirrus, NYCE, etc.): how they work between banks and locations.	• The S.W.I.F.T. financial network. How it works, the amount of money flowing through it every second, how many banks are linked to it, security concerns, the importance of standardization, and how it was done before networks.
Impact Area: A World Run By Computers? Dependency, Vulnerability, Security, Crime, Mission and Safety Critical Applications, Fault-Tolerance	Location of network hub for Network Guides	*Where I live: The Network Guide's Home* How the Network Guide system works *Risky Business?* Visitors face issues about computer ethics		• Mission- and Safety-Critical Applications: How nuclear plant control centers use safety-critical networks and the use of fault-tolerance. This is contrasted to mission-critical applications: Office networks that break down, so no one has access to a critical customer database or the word processing software.	• Computer Network Horror Stories: a collection of actual news reports about system failures. Included would be the phone system going down, the Internet Worm, mistaken identities due to network failures, astronomical mistakes on bills (a $150,000 charge for electricity).
The Airlines	Air traffic control center	*Air Traffic Controller* Visitors view the FAA feed of airplane locations *Call Home* Visitors discover wireless networks through a call on a phone in an airplane		•The Advanced Automation System (ASS) air traffic control program: An illustration of how the next generation (slated for 1996) of the national air traffic control system will operate.	• The SABER System: What it is, how it came about, how it has changed (and how people can now gain access to it), and what is planned for the future (beyond the flight, digital video of different hotels, etc.).

Utility Control: The Central Artery	Auto traffic control center	*Traffic Control Operations* Visitors use a distributed network to solve traffic problems		• An overview of distributed networks: how they work, other examples of their use (oil refineries, manufacturing plants).	• The Central Artery: how it will be controlled by a computer network • The latest network technology used for traffic control: automatic toll collection, digital monitoring, Global Position Sensing.
Education	A net-worked classroom	*The Alice Testbed Project* Visitors access different educational networks		• None	The Internet: A history, how the academic world uses the system and novel information to be had.
Impact Area: Privacy	Transi-tional space between two core areas.	*Networked City Summary* Visitors get a summary of all their actions in the Networked City *Card Reader* visitors can have their credit cards read by a machine		• The Privacy Trail: How a few personal items can reveal a great deal about you	• Privacy under siege: how personal information is collected and used by mass marketers and others. • The Social Security number: a unique identifier and information unifier.
Part IV: World-Wide Connections	Open Space with four main sections	Visitors use this area to try real networks, including on-line services, bulletin boards, the Internet, and remotely connected networked video conferencing and virtual reality activities.			
Section 1: On-Line Services and Bulletin Boards	12 - 15 computers identified by on-line topics.	*On-Line Services by Topic* Visitors gain access to different on-line information *"Raw" On-Line Services* Visitors try standard on-line service front-ends *Bulletin Board* Visitors access local bulletin boards		• A description of how an on-line system is used and works. Visitors follow how a request for information is sent and received through interaction with a PC and modem in a home and the central computer managing the on-line service.	*The Global Community:* How is our definition of community changing with the advent of computer-based communications? Video of people who have met and married over computer networks and people talk about how they interact differently using networks.

Section 2: The Internet	10 computers identified by different Internet services	*The Internet by Services* Visitors try different computer stations highlighting the different services on the Internet: *Gopher, World-Wide Web, UseNet, WAIS, MUDs, Telnet & FTP, Email*		• The Internet: An image that shows its massive structure (see cover of Networked Nation book) and a description of what goes on (File Transfer, Telnet, E-mail, UseNet) and how this is done.	*Information Overload* How do we deal with the massive amounts of information being delivered to us? Also: The increased velocity of technology -- having to do more in the same amount of time
Section 3: Networked Activities Linked to Remote Locations	Demon-stration area	*Remote Video Conferencing/ Networked Virtual Reality* Demonstration where visitors interact with remote locations using video conferencing and virtual reality			
Section 4: Resource Center	Visitor Assistant area where visitors can find out about getting on line -- also is location of server that people can access remotely for Museum info	**VA Station:** Location where visitors can find out more about getting on-line, including the Museum's system. **Server:** System that contains Museum information that can be accessed via a bulletin board, commercial on-line services, and Internet services.	———		

The Networked Society
Advisory Committee Meeting
November 1, 1993

Gardner Hendrie, Ed Belove, Jim McKenney, and Howard Salwen attended the committee meeting along with staff from The Computer Museum, David Greschler, Betsy Riggs, Oliver Strimpel, Gwen Bell, Carol Welsh, and Kristan Cardoza.

Exhibit Development
David began the meeting with a brief overview of the exhibit, giving details about the exhibit's goals, structure and activities.

Following this presentation, members discussed whether projecting Network Guides on large screens in each exhibit area would be effective, since guides talk about individual visitors' experiences. A member suggested that several smaller screens in each exhibit area might be better. David explained that Museum visitors most frequently come in groups of three, so that groups are really not very large. Larger screens will actually be a bonus because visitors like to see what other people are doing, and they will be able to see how different Network Guides interact differently with each exhibit area. In addition, larger screens will serve to attract visitors to each area.

The committee then discussed specific exhibit activities.

Air Traffic. They first discussed the air traffic control area. Advisory Committee members questioned whether watching air traffic and flow control screens is really a compelling activity. They talked about including reservation systems but decided that they are not very exciting. The committee concluded that an activity is not necessary if visitors can watch networks operate in real-time. Advisors felt that the Museum should be able to get a direct connection for the Boston area so that visitors can watch aircraft traffic in real-time. Advisors suggested that the Museum look at Raytheon since it is the principal contractor for air traffic control systems.

Internet Traffic. A committee member suggested that the exhibit include a monitor that shows computer traffic on the Nearnet. Visitors could watch their own interactions take place across the Nearnet.

Finance. The committee then discussed the finance application area. To make this area interesting, they suggested visitors swipe their own real ATM cards and that the machine give them basic information about their account (i.e.. the date and location of their last financial transaction). This personal interaction will send a strong message about privacy. The group suggested staff carefully consider whether this is activity appropriate and whether it will fascinate or frighten and anger visitors. One member suggested that the ATM machine spit out Museum money that visitors could use in the Museum store. The Museum needs to

investigate how much it will cost to produce credit card look alikes. Advisory committee members felt it is important to have smart cards look like real credit cards, that is they should be plastic instead of paper. The Museum will look into having Mastercard/VISA get involved with this part of the exhibit.

Committee suggested the Museum look into banks that use automated banking. The bank mentioned was BayBank; Jim McKenney is going to help pursue this. BayBank runs on Pronet.

David talked next about possible activity for S.W.I.F.T. - Society for Worldwide Interbank Financial Telecommunication, if it were to sponsor the exhibit. Committee members suggested that this area be more interactive, possibly using a CD ROM so that visitors can select the markets with which to interact. This way each visitor's experience will be different.

Inter-networked Business. A committee member suggested that Museum staff look at how corporations, such as L.L.Bean, Federal Express, 800 numbers, credit agencies, inventory controls, and banks, are inter-networked. Jim McKenney said he would speak to his contact at Federal Express and try to get him to the Museum for a visit.

Home/Office. Next, the group discussed the home/office area of the exhibit. David suggested an interactive multi-player game, something like the networked puzzle that is currently in Tools and Toys. Committee members suggested that this area be used to explain and explore bandwidth. Users could turn a dial and see a graphic demonstration of how bandwidth impacts the ability to transfer text, sound and video. They also suggested that there be an illustrative representation of bandwidth, i.e.. the size a copper wire equal in bandwidth to a fiber optic line.

Medicine. The medical applications of network technology was then discussed. The committee suggested that the exhibit not include applications where the technology is not well developed.

Education. The group made numerous recommendations for activities for the education area of the exhibit. They suggested the exhibit focus on science education and the technology's importance to scientific research. It could include a demonstration of gigantic databases such as Cern and simple databases such as the one at Carnegie Mellon which tracks a Coke machine.

Remote Connections. David asked whether it would be best to structure this area around topics vs. providers. The group concluded that it's most important to show the breadth of services and information available across the Internet and other on-line services. It is up to David to decide how best to do this.

Privacy. The next issue discussed was privacy. Should this aspect of the exhibit be embedded in the exhibit or kept separate? The group felt it is important to do both. The exhibit will track visitors; their actions will be monitored, and they will receive a report on all their interactions at the conclusion of the exhibit. In this

way, visitors will experience how network technology affects their privacy. In conclusion, visitors will move into a distinct environment that focuses exclusively on how network technology operates and impacts them personally and will also provide information on how to protect their privacy.

Fundraising Status
The group then went over current fundraising status. Oliver said that January was a crucial month for the Museum. If we raise $500,000 by then the exhibit will continue as planned. If we do not, the exhibit will have to be reconsidered and scaled back.

Action Items

Paul Severino:
telephone follow up to letters AT&T, Cabletron, MCI
letter to NASDAQ, Thomson Financial

Gardner:
telephone Bill Foster, John Morgridge, Khalish Khanna (SWIFT)

Ed Belove:
follow up with Compuserve, Ziff-Davis, and AOL

Salwen:
contact at Merril Lynch

Jim McKenney:
follow up with BayBank - invite Crozier to Museum
follow up with Federal Express - invite to Museum

The Computer Museum

300 Congress Street
Boston, MA 02210
(617) 426-2800

November 29, 1993

To: Ed Belove
Gardner Hendrie
James McKenney
Howard Salwen
Paul Severino

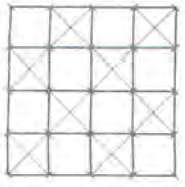
Fr: Kristan Cardoza

Re: The Networked Society

Attached are minutes from "The Networked Society" Advisory Committee meeting held earlier this month. Since that meeting, the National Endowment from the Humanities awarded the Museum a planning grant of $50,000 for "TNS." We should hear from S.W.I.F.T., NYNEX, and Sprint by the end of the year. In addition, Oliver, Betsy, and Gwen were in California earlier this month where they met with several strong prospective funders of "The Networked Society."

David has been working on the exhibit's activities, incorporating many of your recommendations. He will present them to the Committee at its next meeting.

We will schedule a meeting for January soon and will call to see what dates are good for each of you.



The
Computer
Museum

300 Congress Street
Boston, MA 02210
(617) 426-2800

October 25, 1993

Dr. Kailash Khanna
390 North Fullerton Ave.
Upper Montclair, NJ 04703

Dear Dr. Khanna,

Laura Morse recently informed me that you are interested in participating as a member of the Advisory Committee for our new exhibit, *The Networked Society*. We are delighted that you are willing and able to lend your experience and expertise to this project.

Scheduled to open in November 1994, this $1.5 million, 5,000-square-foot interactive exhibit will play a significant role, in promoting public understanding and use of computer networks and networked computing. The Computer Museum has a successful history of developing interactive, educational exhibitions and programs about computer technology. Again, with *The Networked Society* the Museum will present an exciting project that will foster public appreciation and understanding of this emerging technology.

Although being at S.W.I.F.T. in Belgium will certainly limit your time and availability, I do want to extend an invitation to attend our next Advisory Committee meeting on November 1 from 6-8 p.m. at the Museum in Boston.

I have enclosed some information about the Museum and the proposal sent to the National Science Foundation which details the exhibit. I will call you soon to discuss it further and to learn more about your particular interests.

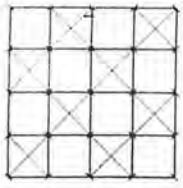
Thanks again for your willingness to participate and welcome to the Committee.

Sincerely,

Gardner C. Hendrie

Gardner C. Hendrie

cc: Laura Morse



Fannie Cox Foundation	50
Novell	100
Sec. of Trans - Com MA	100
WLFT	25
Severino	25
Sun	50
	$350

1 Foundation	50
3 Company	175
1 Govt.	100
1 Personal	25

Networked Database - i.e. Dow Jones
Central Artery Traffic Control
Wired Home -
Retail - ~~SDS~~ supermarket system
Banking - cash machine, ATM
Airlines Reservations
E-mail to the White House

Networked Society Advisory Bd

Paul Severino
Howard Salwen
Ed Belove
Jim McKinney
Sw.Pt CIO
Steve Finn

George Halvorson - Charlie Z

Cable Co.'s - Bell Cons - Bob Lucky
Amos Hostetter - Continental
~~Disney~~

Networked Computer Applications

Supermarkets
Staples - Tom ? Laura Morse
PS - Leo Kahn

send out copy of NFS proposal

Weather - Charlie Z
NASA

1) What
~~2) funding~~
2) exhibits
3) advisory bd.
4) funding
5) help → join advisory bd. companies

THE NETWORKED SOCIETY ADVISORY COMMITTEE MEETING

9/2/93

AGENDA:

1) What is the objective of the exhibit?

2) What should be the major sections of the exhibit?

3) What are some compelling stations for the exhibit and who are the natural potential funders for each station?

4) Next meeting?

PROJECT SUMMARY

The Computer Museum in Boston, MA, plans to develop, evaluate, and install a permanent 1800 square meter museum exhibit which is designed to promote public understanding and use of computer networks. Opening in the winter of 1994-95, The Networked Society museum exhibit will: (1) educate a diverse public audience about the many applications of computer networks; (2) teach principles of computing science and technology; (3) examine topical issues involved in computer network development and use; (4) help increase the number of American citizens who are educated in the use of computer networks; (5) help increase the number of young people who pursue computer networking as a lifelong interest, skill, and/or career. The exhibit will impact 1.7 million people in three years, and address issues of technology access by educating a broad public audience with diverse computer literacy backgrounds.

Diversification and increase of the future workforce in mathematics, science, and technology is a primary NSF education objective. The proposed science museum exhibit project will assist this and other NSF objectives to address issues of technology transfer and technology access to and among the American public.

Table of Contents

Overview

The Computer Museum in Boston, MA, requests support for the development, evaluation, and installation of **The Networked Society**: A Museum Exhibit Designed to Promote Public Understanding and Use of Computer Networks. This 1800 sq. meter (5000 sq. ft.) hands-on science museum exhibit will: (1) educate a diverse public audience about the many applications of computer networks; (2) teach principles of computing science and technology; (3) examine topical issues involved in computer network development and use; (4) help increase the number of American citizens who are educated in the use of computer networks; (5) help increase the number of young people who pursue computer networking as a lifelong interest, skill, and/or career. **In three years, the exhibit will impact 1.7 million people nationwide,** and address issues of technology access by educating a broad public audience with diverse computer literacy backgrounds.

Planning for this major exhibition is well underway in cooperation with an active advisory panel of leading researchers, educators, and theorists, and significant support from the private sector. The total project cost for the research, development, evaluation, and installation of the proposed museum exhibit is $1.7 million. Over $300,000 for the initial research phase has already been raised from the Fannie Cox Foundation, the Commonwealth of Massachusetts Department of Transportation, Novell, Inc., and Wellfleet Communications.

The Digital Equipment Corporation (DEC) has already given a $150,000 equipment grant to the exhibit project; The Computer Museum anticipates that about $500,000 of the total project costs will be supported by inkind donations of computer hardware and software. $568,223 in NSF funding would support partial staff salaries, and the development, evaluation, and installation of major educational exhibit devices. Support for the balance of project costs is now being sought from the National Endowment for the Humanities (proposal submitted in June, 1993), and these donor prospects: NYNEX, Sun Microsystems, Society for Worldwide Interbank Financial Telecommunication (S.W.I.F.T.), and Stratus Computers.

Need: The National Crisis in Science Education

The number of young people pursuing careers in science, mathematics, and technology is at a critical low. Women and people of color, the largest segment of the nation's future work force, have particularly low participation rates in science and engineering higher education and careers. Research Priorities In Computer Networking And Communications, a report of a workshop sponsored in April, 1992 by the NSF Division of Networking and Communications Research and Infrastructure, underscores the urgent need to increase public support for computer network research, and to increase computer science and technology skills among the future workforce (NSF pub.#: 92-109). Over two million people are currently employed in the U.S. computer industry, which has gross annual revenues in the excess of $100 billion (ibid., 1992).

Computerized information and communications networks permeate nearly every aspect of American commerce and many forms of home and leisure activities, yet a very significant proportion of American citizens are unaware of the wide scope and deep impact of computer networks. Despite their many applications in everyday life, computer networks are not widely understood or used by the general American public. By contrast, over $21 billion in research is annually invested in the development of broadband computer network projects for use in Japanese households (McKnight in Kahn, ed., 1992). American young people **are** interested in and attracted to computers. But educators have yet to tap the full educational and motivational potential of computing to stimulate student involvement in scientific and technical fields. The average public school has only one computer for every 30 students; elementary students in the U.S. typically have less than 20 minutes of hands-on computer time per week (Power On!, U.S. Office of Technology Assessment, Sept., 1988). According to a 1991 study by the U.S. Department of Commerce, only 15% of all American homes contain computers; 63% of these are installed in households with annual incomes exceeding $75,000.

Public schools in low-income communities are the least likely to provide students with adequate, if any, computer access (ibid., 1988). The formal public education system does not generally promote the basic level of computer literacy necessary — and indeed, much of it misses the mark entirely in developing widespread literacy in computer networks — to enable young people to succeed in many modern careers. Inequities among public schools may even increase problems of technology access for diverse Americans.

Diversification and increase of the future workforce in mathematics, science, and technology is a primary NSF education objective. The proposed hands-on science museum exhibit project will assist this and other NSF objectives to address issues of technology transfer and technology access among the American public.

The Hands-on Science Museum Education Method

The informal science education system in America has a long history and tradition of promoting public understanding and interest in mathematics, science, and technology.

Many scholars point to the 1903 opening of the Deutsches Museum in Munich as the first seed of hands-on science education. In America, the tradition was catalyzed by the display and demonstration of real tools, real experiments, and three-dimensional mechanical models at the scientific expositions and world fairs of the late 19th and early 20th centuries. America's first hands-on science museums opened in Chicago (The Museum of Science and Industry, 1933) and Philadelphia (The Franklin Institute Science Museum, 1934). These institutions reflected a mature Industrial Revolution and, despite the Great Depression, a growing American fascination with "techno-culture." The new hands-on theory for science education stood out in marked contrast to formal schooling and the collect-research-display objectives of early natural history museums. First-hand experiences with the real tools and real processes of scientific inquiry, visitor interactions with push-button exhibit models, and public opportunities to meet professional scientists and attend scientific lectures were the keynotes of the new hands-on science museum methodology.

Frank Oppenheimer, and associates at the Exploratorium in San Francisco, CA, and elsewhere, spearheaded new directions of research into theories of museum learning in the 1950-'70s. The Exploratorium pioneered new three-dimensional exhibit designs that helped the public use spatial-kinetic as well as logical reasoning to physically experience and explore the effects of scientific phenomena. Oppenheimer reasoned that this physical experience would help the public understand abstract and often complex scientific principles. The science museum profession in the U.S. proliferated with the Exploratorium's methodologies and Oppenheimer's theories, and came of age when NSF established funding for community science resources. The Association of Science-Technology Centers (with 264 professional members) reports that 83% of all 415 hands-on science museums in the U.S. have opened within the last thirty years.

Research conducted by Novak (1981; 1984), Bredderman (1983), Gardner (1983), the National Academy of Sciences (1986), Linn, ed. (1986), Resnick and Klopfer, eds. (1989), and the National Research Council (1990) documents the cognitive value of hands-on science learning, especially among disadvantaged student populations. The NSF has invested considerably in the research and development of hands-on science curricula for students in grades K-14, along with supportive professional development in activity-based science instruction methods for American teachers. The Exploratorium in San Francisco and the Science Center of Connecticut in West Hartford both play major and pivotal roles in NSF-supported Statewide Systematic Initiatives to improve public science, mathematics, and technology education. Many hands-on science museums are dominant educational forces in major U.S. cities and large regional areas.

Present State of Computer Network Education

A number of educational projects and commercial enterprises enable the public to learn about and gain access to computer networks. Computer bulletin boards run by hobbyists and corporations like CompuServe, Delphi, America On-Line, Prodigy, and GEnie encourage people to "log-on" to large computerized networks and databases, often with help from computer-user groups like The Boston Computer Society and the Berkeley Users Group. The New York Public Library is planning a Science, Industry, and Business Library (SIBL), a network center for worldwide information on U.S. and foreign business, patents, and other science resources. SIBL will also include a training center to help small businesses effectively use the new network. Although commercial and interest group networks are often "user-friendly" in design, their purpose is not educational; they are primarily used by people who already have significant backgrounds in computing.

NSF and other major funders have sponsored several major computer networks in school settings. The most notable of these is the National Geographic's Kids Network, a major demonstration model funded twice by NSF, which enables students to share environmental data and confer with scientists and other young people throughout the world. ECONET, sponsored by other U.S. environmental education programs, accomplishes the same goal on a national basis. LabNet, also funded by NSF, targets science teachers throughout the U.S., and promotes a sharing of information and ideas on classroom teaching. These excellent school-based network projects have been widely successful; they succeed best in affluent communities where children have had some prior exposure to computing, and where professional development and support can be adequately provided to teachers (see Annual and 98A Reports submitted for NSF grant #s: 86-52120; 88-50465; 91-55358).

Recently, NSF awarded support to Common Knowledge: Pittsburgh (92-53452), a project designed to test the costs and efficacy of integrating a computer network (designed for on- and off-site communications, and the development and testing of new scholastic curricula) into a large urban school system. This program, now in its first year of implementation, is a test case for assessing how people with diverse computer literacy backgrounds can be equitably incorporated into and served by computer networks.

Many hands-on science museums have exhibits on telecommunications; many of these include small areas or sections on computer networks. **The proposed project will be the first hands-on science exhibit to treat the topic of computer networks in a comprehensive manner.** A few science museums have already begun to experiment with computer networks as tools for public education. The first important foray into computer-networked exhibitry was funded by NSF (89-53420) and the Unisys Corporation at The Franklin Institute Science Museum.

The Franklin's Unisystem can track visitor progress through all 32 museum exhibits. It provides indepth information about exhibit topics, and refers visitors to other museum and informal science learning resources. The Unisystem model was applied in the Smithsonian Institution's exhibit on The Information Age where visitors use cards with bar codes to track their progress and obtain **a summary of exhibits they used at the end of their visit.** By contrast, at the National U.S. Holocaust Memorial Museum in Washington, D.C., visitors access a computer network **at several points throughout their museum visit to get immediate information** about real victims and survivors of the Holocaust.

These computer-networked exhibit devices have all wrestled with technical challenges of maintenance under heavy visitor use and problems of access for people with diverse computer literacy backgrounds. Prior experiments with computer networks in these educational settings have provided instructive models and resources for the development of The Networked Society museum exhibit.

Rigorous evaluation will assist the development of Networked Society exhibit devices that provide "Network Guides," like doctors or athletes, who will recognize individual visitors at each exhibit station, and reference ideas presented in different areas of the exhibit. Exhibit testing will support the design of a reliable maintenance system and computer menus that can be used by novices and experts alike, serving 1.7 million people nationwide in three years.

Project Relation to the Mission and Long-term Goals of the Institution

The Computer Museum in Boston, MA, promotes public understanding of computing science, technology, and history. It serves a diverse public audience in its location on the Boston waterfront, adjacent to the Boston Children's Museum. One-third of Computer Museum visitors represent minority groups. Through special Museum access programs for Boston's innercity schoolchildren, over 60% of the Museum's total group audience (over 13,000 schoolchildren annually) receives reduced or free admission to The Computer Museum. Over 3000 free passes are distributed every year to Boston's public and parochial school teachers.

Research into computing science and network applications is one of today's leading areas of scientific study. From medical imaging to Muppets, from satellite and telephone communications systems to banking and finance databases, computer networks permeate modern life. Like mathematics, computers are the fundamental tools and international "language" of modern science. Founded in 1982, The Computer Museum promotes basic and advanced levels of computer literacy among the American public with focus on the technology, applications, and history of computers. Its programs encourage young people to pursue computing as a lifelong interest, skill, and/or career. The Museum strives to reduce critical barriers to computer literacy among diverse segments of the American public.

The Computer Museum began in 1974 when Ken Olsen, founding President of Digital Equipment Corp., and Robert Everett, founding President of MITRE Corp., rescued the MIT Whirlwind computer — the world's first real-time, parallel, vacuum-tube computer with a core memory — from the junkpile. Since then, public education in computing as a science, technology, and an artifact of American culture has grown from the Museum's original collecting mission. Now celebrating its 10th anniversary, The Computer Museum has established itself as both a leader in the public interpretation of computing history, science, and technology, and as a developer of educational software programs for computer-based museum exhibits.

Most importantly, The Computer Museum acts in a mentorship capacity to a significant number of highly motivated adolescents. Every year, over 650 students from widely diverse backgrounds are drawn repeatedly into the Museum. Once these youths become known to museum staff, they get special privileges that enable them to engage in extended educational activities throughout the museum. Highly motivated teens are a primary audience target for the Museum; our staff works hard to structure youthful energy into meaningful projects.

The Museum's Computer Clubhouse and Youth Advisory Board engages about 400 multi-cultural middle and senior high school students every year in the development and evaluation of museum programs and exhibits. With assistance from these youths, The Computer Museum has tested and proven effective a series of twenty Computer Exhibit Kits. These kits have been professionally recognized for their educational efficacy and motivational ability to teach basic and advanced principles of computing science. The Computer Museum's Exhibit Software Kits are now being internationally disseminated with start-up support awarded from NSF (see Results of Prior NSF Support). Systematic tests on the affective and cognitive impact of hands-on computer-based exhibitry have been the fundament of program development at The Computer Museum (see Exhibit Evaluation).

In 1989, The Computer Museum launched a five-year Strategic Plan to build five cornerstone exhibits to fulfill its mission and promote public understanding of computer technology, applications, and history. The cornerstone exhibits are:

The Walk-Through Computer: The museum's two-story gateway exhibit teaches the fundamental principles of computing science and technology. Hands-on experiences with a larger-than-life track ball, keyboard, memory chips, and disk drive help people learn how computers work. Opened in 1990 with major support from: Alfred Sloan Foundation; DEC; Apple; AT & T.

People and Computers: This 1800 sq.m. exhibit traces the history of computing and its impact on society by looking at how computers have changed work, social relations, commerce, and leisure. Opened in 1991 with support from: National Endowment for the Humanities; DEC; Apple; Lotus; MITRE; Unisys; IBM.

Tools and Toys: 45 computers run 35 hands-on exhibits on eight applications of personal computers: graphics; writing; sound creation and voice recognition; number manipulation; modeling; databases; education; gaming. Opened in 1992 with major support from: Apple; Boston Computer Society; CEO of Microsoft Corp.

Robots and Other Smart Machines: The 1st "intelligent" mobile robot, the smallest underwater robot, NASA's Mars Rover, and 22 other smart machines teach the public about artificial intelligence, artificial life, and robotics. Opened in 1993 with major support from: The American Association for Artificial Intelligence; DEC; Sun Microsystems; MAXIS.

The Networked Society: The final cornerstone exhibit on computer networks is scheduled to open in the winter of 1994-95. Now in development, this exhibit is the focus of this proposal to the National Science Foundation.

Project Advisors for THE NETWORKED SOCIETY Museum Exhibit

An active panel of expert advisors has been instrumental in the development of The Networked Society museum exhibit. Beginning in 1992, regular meetings with professional scientists, educators, and business people have helped museum staff to identify leading research trends and develop educational objectives for the exhibit, to model and refine educational designs for hands-on exhibit components, to gain access to corporate and academic laboratory resources, and to remain current with topical events and issues in the development and use of worldwide computer networks (see commitment letters in Appendix A). Project advisors are:

- **Dr. Robert Baum:** Former Director of the NSF's Ethical and Human Values Implications of Science and Technology Program, and now the Director of the Center for Applied Philosophy and Ethics in the Professions in Florida.
- **Dr. Mark Weiser:** Principal Scientist, Computer Science Laboratory, Palo Alto Research Center, CA.
- **Paul J. Severino:** CEO of Wellfleet Communications, Inc., a leader in the local area and wide area networking industry.
- **Vinton Cerf:** President of the Internet Society and Vice President of the Corporation for National Research Initiatives.

- **Dr. Alan Westin:** Professor of Public Law at Columbia University, Dr. Westin is an expert on legal issues of privacy raised by the use of computer networks.

- **Dr. Lee Sproull:** Boston University School of Management, Dr. Sproull has conducted seminal research on organizational "cultures" and computer networks.

- **Jane Manzelli:** Director of Computer Programs, Brookline Public School District, Boston, MA. Ms. Manzelli has advised all exhibits in the Strategic Plan.

- **Youth Advisory Board and Computer Clubhouse:** A core group of 40 representatives from the over 400 multi-cultural teen members of these two museum committees will help evaluate The Networked Society and help ensure that exhibit content appeals and is accessible to diverse public audiences (see Exhibit Evaluation).

THE NETWORKED SOCIETY: Educational Objectives

The primary objectives of this 1800 sq. meter hands-on museum exhibit are to:

- **Educate a diverse public audience about the many applications of computer networks,** particularly in transportation, telecommunications, homes and offices, finance, education, government, and health care;

- **Teach principles of computer networking science and technology** from basic definitions of modems, clients, servers, hubs, and network operating and management systems to more complex principles about bandwidth, information transmission, and wireless technologies;

- **Examine topical (social and ethical) issues involved in computer network development and use** i.e., privacy of information, changes in work habits, interpersonal and group relations, impact on economy and commerce;

- **Help increase the number of American citizens who are educated in the use of computer networks;**

- **Help increase the number of young people who pursue computer networking and the development of its applications as a lifelong interest, skill, and/or career.**

Exhibition Design

Emerging research on the cognitive and motivational impact of museum learning (see esp. Borun, 1977; Tressel and Spock, 1987; Gregory, 1989; St. John, 1990; Serrell, ed., 1990) affirms the marked ability of hands-on science museums to: (1) stimulate public interest and motivate learning in and outside the classroom, and (2) teach a significant number of broad scientific themes, ideas, and principles within the course of an average visit to a single museum exhibit (25 minutes for individuals and families; 40 minutes for school and youth groups).

The Networked Society **exhibit is intentionally designed to extend the average length of a museum visit and intensify learning experiences.** Its exhibition design aims to capture visitor attention for a new average of at least 40 minutes for individuals and families, and 60 minutes for school and other youth groups.

The exhibition design will help structure, but not restrict, visitor traffic into meaningful educational sequences:

1) An introductory film experience;

2) Staff demonstration of exhibit's main computer network, its visitor-tracking devices, and selection of visitors' own personal "Network Guides";

3) Hands-on activities with basic computer network technologies, hardware, and software;

4) Exploration in exhibit areas that examine basic and important applications of computer networks in transportation, telecommmunications, homes and offices, finance, government, and education;

5) Assistance in the further understanding and use of computer networks.

A 5-7 minute film presented in a 25-seat theater will introduce visitors to basic networking concepts through the "eyes" of a speeding data bit. The film will review the evolution of computer networks, define basic terms, and introduce primary exhibit themes on the broad applicability of computer networks. Film presentations can help orient visitors to educational themes and goals in museum exhibits. The introductory film will also help diverse public audiences develop a basic technical vocabulary for the operation of exhibit devices.

At the end of the film, people will be greeted by museum educators and volunteers who will demonstrate the use and purpose of "Network Guides." These hypothetical characters (athlete, teacher, doctor, 12-year-old, home office worker) will appear in full-motion video on computer screens. Visitors will choose a Guide who will follow them throughout the entire exhibit with the use of a central computer network and a visitor tracking badge, such as a personal bar code card, smart card, or active badge. When a visitor approaches an exhibit kiosk, the tracking device will tell the central computer to display the Network Guide the visitor had selected at the beginning of the exhibit. The Network Guides will appear and introduce visitors to key concepts in each exhibit area and relate how people are impacted by network applications. **Scenarios with a Network Guide:**

A visitor begins by choosing a doctor as their Network Guide. The doctor greets the visitor and says that she will accompany them throughout their journey to Networked Society exhibit areas on network applications in transportation, telecommunications, finance, homes and offices, government, and education. She says: "I'll meet you there!"

The visitor choses finance. The doctor appears and exclaims, "Good first choice!" She goes on to explain that finance in health means insurance billings, and describes a network that helped her automatize patient reports. She says: "My staff used to type out these forms and send them by mail at a cost of $130/week. At first, I had to invest a lot of time and money in staff re-training, but now with the network, we finish the same job in less than 1/3 the time, and send out reports via modem at a cost of only $30.00/month!"

In other exhibit areas, the doctor can reference back to finance, and show how she satisfies insurance requirements for second opinions by jointly viewing and discussing a digitized real-time video of an angioplasty procedure with a distant colleague across a broad bandwidth connection. The doctor also shows how she uses Grateful Med, a bibliographic NIH database that allows her to quickly find the latest medical research publications. The human side is also presented by the Network Guides. Here, the doctor laments: "I do miss the human contact — you can't share coffee with friends over the network."

It is important to note that The Computer Museum is committed firmly to exhibiting only those computer applications that reflect actual and current directions of computer research. This exhibit will not validate, for instance, any imminent availability of 500-channel home entertainment hook-ups, or other misleading commercial claims.

In particular, visitors will learn how science is impacted by computer networks. The exhibit will explain research databases, and show how scientists share information and correspond via computer network bulletin boards. Visitors will also see how athletes can access Consumer Report's database to check performance statistics on new sports equipment, or how 12-year-old students might search for real data on volcano emissions, rather than rely on textbook examples.

The "Network Guides" not only explain computer applications and principles, they also provide a human dimension to explanations of technological advance. The Network Guides are in and of themselves instructive embodiments of computer network capabilities. Programmed into the exhibit's main computer network, the Network Guides are vivid demonstrations of how:

- Computer networks can share and distribute information among other computer stations anywhere on a network;
- Networks can gather and track information about individuals — credit ratings or health histories — as they live and work in America's networked society.

Exhibit Areas

I. Network Basics

The first exhibit area will introduce visitors to fundamentals of computer networking. Analogies to the U.S. postal and highway systems and more personal networks of friends and families will help delineate basic differences between small networks and large infrastructures. Using pre-configured hardware — a single "server" (a central repository of information), several "clients" consisting of computer stations with keyboards, and a "hub" connector for cables — **visitors will design their own computer networks** with helpful hints provided on-site by trained staff educators and volunteers.

Models will display the various types of computer networks (Ethernet, Token-ring, ARCnets, and wireless) and explain physical scales — Local Area Network (LAN) and Wide Area Network (WAN) structures. These models will help guide visitor designs. Once built, visitors can use the networks they have devised to communicate with each other using text and/or video depending on how broad a bandwidth they selected for their network.

Visitor Assistants can also activate a more intensive educational game called "The Networked Puzzle." This game allows people to work cooperatively with three other visitors to solve a problem. Each visitor has puzzle pieces the others need, prompting them to use the network to communicate with each other via live video images and audio. Once a piece is located, visitors will use the network to "transfer" the piece from one station to another. Unlike many commercial computer and video games that involve fighting and "shoot-em-ups," the Networked Puzzle game encourages cooperation to achieve a common goal. **COLLABORATION** is fundamental to understanding the purposes and principles of communication in many computer networks, especially in electronic mail and shared documents. Ideas, principles, and definitions conveyed in the "Network Basics" area are:

- Basic network types and scales, corresponding structures and functions;

- Basic ideas about information storage, retrieval, distribution, and sharing;

- Definitions of modem, bandwidth, network interface hardware, cables, hub, server, client, network management software, addressing, protocols.

In the following Applications Areas (items II - VI below), visitors will explore real-world network uses in telecommunications, transportation, home and office, finance, government, and education. Each exhibit area will feature hands-on activities where visitors learn about network applications through first-hand contact with real and simulated network models and devices that focus on the technology, and the social historical significance of various inventions.

II. The Telephone System: A Network Infrastructure

Many people do not realize that the telephone system is a computer network. Many do not know that almost all computer networks have historically depended on the telecommunications infrastructure. This exhibit will highlight the telephone system as the primary infrastructure for computer networking and the large-scale use of networking technology to manage global telecommunications.

The Computer Museum is discussing the possibility of tapping into actual phone traffic data with several phone line carriers, including NYNEX. Here, visitors will encounter large multiple screen projections that replicate networks for telephone traffic in New England. Flashing lights will highlight concentrated areas of heavy telephone use while real-time news broadcasts alert professionals as well as the museum public to unusual occurrences that impact use of the network. Graphics and computer stations will explain how calls are routed through an international infrastructure of satellites and fiber optics.

On a software simulation, visitors would be invited to dial any telephone number and watch how their call is routed through the complex infrastructure. Interactive programs designed by exhibit staff will also fabricate real-world problems — like an overload of calls on Mother's Day or dysfunctions in major hubs due to electric storms — so that visitors can see how the phone system adjusts to problems by re-routing calls through alternative lines.

People will learn that the modern telephone infrastructure has a radically larger information-carrying capacity compared to copper line predecessors. They will also experience how increased bandwidth makes it possible to transmit new forms of data, including video and large data files. They will learn about wireless technologies which are beginning to work independently of telephone lines. The Telephone System exhibit area demonstrates that:

- The international telecommunications network is large and complexly coordinated; it constitutes "an infrastructure";

- The international phone system is a sophisticated computer-controlled network people use every day to commmunicate and transfer data and information;

- The phone network is comprised of diverse components, such as copper phone lines, fiber optic lines, microwave and satellites;

- Information of all kinds — sound, text, graphics, video — can be represented and transmitted into digital information. In this form, it is much easier and faster to replicate and transmit with little aural or visual degradation;

- How computer networking's historical dependence on telephone companies' infrastructure is changing with the advent of new competition from cable companies and other third-party infrastructure providers;

- New privacy issues arise with the use of wireless communications;

- Dependence on large infrastructures may make us less likely to explore options that may alleviate pressures from infrastructure system breakdown.

III. The Traffic Control Center: A Distributed Control Network

Development of The Traffic Control Center is supported in part by Massachusetts' Department of Transportation which is planning a major roadway renovation to assuage Boston's legendary traffic problems. This area will exemplify how distributed control networks gather and synthesize data in Boston's own "Central Artery" traffic control center.

In the Central Artery project, computers gather and synthesize data about traffic flow. Digital cameras positioned at key points in the city count cars to document traffic flow and monitor air quality in Boston tunnels. This data is relayed back to a central control center across a broad bandwidth fiber optic "backbone." People and computers in the control center process this data to alter traffic lights and digital speed limit signs, activate air pumps in tunnels, and determine the most efficient routes in and out of the city.

A live video feed from the Artery's own digital cameras and a large computer screen display of traffic and air quality monitors will be positioned near a window overlooking actual Central Artery construction. People will watch the computer receive and process information as they watch actual traffic conditions change, and listen while state police and other traffic monitors react to traffic situations. Visitors will also interact with a "Traffic Jam-up" game that challenges them to try and untangle simulated traffic jams.

Exhibit text will present a balanced view of the pros and cons of the new technology for traffic control. Its use can cut down on traffic congestion and reduce auto emissions from idling cars. But exhibit panels will also explain plans for the future installation of "wireless" communications that might automate toll collection on Boston bridges, but also raise questions about the difference between tracking cars and tracking individuals. Major concepts are:

- Computers help people manage complex systems;

- Demonstrations of "real-time" monitoring and distributed control networks;

- Explorations of issues related to individual privacy.

IV. The Wired Home: Home-based Networks

A comfortable living-room setting with soft couch, coffee table, and rocking chair will invite visitors to enjoy a multimedia presentation on the many home, work, and entertainment network technologies that are now or will soon be available to American homes. Home shopping, video-on-demand, and the ability to remotely visit museums, lectures, and sports events are among the many current potentials for home-based computer network technologies.

The "Wired Home" will have a special focus on "telecommuting." Computer networks have allowed a growing number of workers to conduct business at home. Visitors will listen as people talk candidly on video about the ups and downs of telecommuting — less travel time, less transportation pollution, more flexible hours, more time for parenting, less peer interactions and collegial community, and weight gain are among the many changes faced by people who work at home.

This area will also explain "Smart House" technologies that allow people to control energy useage, respond to crying babies, and avoid unwanted phone calls by programming an individualized home network. Major concepts in this area are:

- Large amounts of information are now accessible in the home through the telephone, television, computer, and other hybrid household technologies;
- Smart systems coordinate information and complete tasks through computers;
- Insight into personal, social, and work habit implications of home-based computer networks.

V. **Other exhibit areas** under development for The Networked Society include:

- GOVERNMENT: Exhibit devices will allow visitors to access diverse government databases such as census information, Library of Congress files, agriculture and business reports, E.P.A. data on toxic waste and storage sites, etc.

  The Computer Museum has already tested an exhibit device that will enable visitors to participate in the democratic process by sending electronic mail directly to President Clinton or Vice President Gore. Samples of visitor letters and presidential responses are attached in Appendix B.

- FINANCE: An examination of S.W.I.F.T., the international network for transferring funds among banks, and a visualization of how Automated Teller Machines (ATMs) and credit card systems work.

- EDUCATION: The Computer Museum is already a part of the "Alice Testbed," which includes educational networks such as National Geographic's Kids Network, ECONET, and E.P.A data files on U.S. wetlands. Visitors will also learn about library databases that enable people to locate and reserve books in any library that has installed a network.

VI. Remote Connections/National Impact

The final "Remote Connections" area of the exhibit will hook up museum visitors to people and information beyond the Museum's walls. It will allow people who cannot visit the Museum to access some of The Networked Society's exhibit devices and text, and even join in some visitor activities. This final exhibit area fulfills project goals for national impact on an estimated 1.7 million people in three years through: (1) in-house exhibit explorations with Internet and diverse computer bulletin boards; (2) the Museum's own network downloading capabilities; (3) educational materials provided to parents and teachers of schoolchildren; (4) remote off-site connections to people in other museums and shopping malls; and (5) computer software kits for use in other museum settings.

In-house Exhibit Explorations: Planning grant funds piloted the development of a very user-friendly Internet installation which allows museum visitors to send e-mail letters to the White House **(see response letters from President Clinton and Vice President Gore in Appendix B).** Access to Internet will expose 150,000 annual museum visitors to this growing global network, now comprised of an estimated 15-30 million users. The public will explore Internet using specially designed navigational software that introduces them to the many special interest groups and the vast amounts of information available on this massive network. Graphics will describe Internet history and growth, and explain how to join international conversations on topics ranging from astronomy to films. Software programs will block access to Internet material that may be inappropriate for museum audiences.

The "Remote Connections" area offers hands-on experiences with many bulletin boards and commercial network connections, such as CompuServe, America On-Line, ZiffNet, etc. Since the development of the Museum's first cornerstone exhibit, exhibit staff have developed a protocol for front-end user software that allows even the most computer-phobic visitor to navigate in meaningful ways through computer-based programs. This front-end user software facilitates visitor access to a variety of bulletin boards and commercialized networks. Visitor Assistants will also be present to assist the public in the use of all exhibit devices. Estimated impact in 3 years: 450,000 people.

Downloading: Anyone with a personal computer and modem will be able to access the Museum's own computer bulletin board and download diverse items including: text labels and digitized images from The Networked Society; the collections catalog; samples of interactive exhibit software; and text and images from all five cornerstone exhibits at The Computer Museum. This information will also be made accessible over Internet via a File Transfer Protocol (FTP) site. The museum is pursuing the possibility of offering access to the FTP site via GOPHER. Estimated impact in 3 years: 600,000 people.

Educational Materials: About 25,000 educational guidebooks will be distributed every year to teachers, parents, and students which describe in detail how people can use home modems and personal computers to access a wide range of computer networks, including the Museum's own bulletin board. All visitors will be encouraged to inform the Museum's bulletin board of any time and date they were able to access CompuServe or any other computer network from their homes or schools, so that the Museum can count them and thus track the exhibit's potential for national impact through remote connections. Estimated impact in 3 years: 75,000 people.

Off-site Connections: Museum visitors will be able to directly interact with people in off-site locations such as other museums, libraries, and shopping malls. Software now being developed by the Museum with Northern Telecom and Motorola will enable distant users to communicate verbally and visually and even cooperatively draw pictures together! This hands-on exhibit has already been successfully prototyped and tested by Computer Museum staff with research and planning funds provided from the Fannie Cox Foundation. Eight museums and libraries have already expressed interest in hosting remote connections sites for this national exhibit project (see Appendix C).

The Computer Museum expects to be able to coordinate eight remote connection sites simultaneously. Estimating a significant interaction time of five to ten minutes between museum visitors and people in off-site locations yields a conservative estimated impact on an additional 100,000 Americans every year; 300,000 in three years.

Computer Software Kit Distribution: The Museum intends to develop three software programs from The Networked Society exhibit for distribution to educators in both formal and informal settings: "The Networked Puzzle Game," "Telephone Traffic Jam-ups," and a simulation of S.W.I.F.T., the international bank fund transfer network. Past experience indicates that the intense indepth educational content of these computer exhibit kits makes them highly-attractive educational products, and anticipates at least fifteen kit sales impacting about 325,000 people in museums nationwide by the third year after exhibit opening.

Exhibit Evaluation

Natalie Rusk, M. Ed. from Harvard University and Director of Education for The Computer Museum, will supervise the work of an evaluation specialist who will be hired to conduct formative and summative evaluations on The Networked Society. Ms. Rusk has developed educational materials for all five cornerstone exhibits; she also manages the Museum's Youth Advisory Board and Computer Clubhouse.

A core group of 40 senior members of the Museum's more than 400 multi-cultural adolescents in the Youth Advisory Board and Computer Clubhouse will assist in the evaluation of exhibit devices, text, graphics, and models. Teen advisors are an integral part of exhibit development at The Computer Museum; they are our sharpest critics and best on-floor Visitor Assistants! They help ensure that Computer Museum exhibits are accessible to a wide range of visitors with diverse backgrounds in computer literacy.

Formative and summative exhibit assessment plans will employ a variety of methods to gauge the cognitive and affective impact of the proposed exhibit project. The Youth Advisory Board and Computer Clubhouse will review exhibit outlines, help staff decide on specific educational goals for each device, and establish a first estimate of significant lengths of visitor interaction time for each exhibit device. On the basis of advisor recommendations, exhibit staff will select an approximate total of 70% - 80% of exhibit devices for on-floor prototyping and testing during the formative evaluation stage. Beginning in October, 1993, clusters of exhibit devices will be prototyped with preliminary directions for device operation, and set on the museum's floor in an area called "The Exhibit Lab" for testing cycles of 2 - 3 weeks.

During this time, approximately 2100 museum visitors with diverse backgrounds in computer literacy will interact with and help test exhibit prototypes. Each computer-based device contains a standard software program that not only counts the number of visitors who use the device, but also times and documents the extent of visitor interaction. This program is analyzed by staff to pinpoint areas of frustration about device operation, confusion with educational concepts, and technical errors in the hardware or software. Analysis of this visitor-tracking program helps to refine expectations about average and significant lengths of visitor interaction with each device.

The evaluation specialist situated on-site in the "Exhibit Lab" will observe visitor interactions, and engage a significant sample of visitors in three age brackets (8-12; 12-18; 19+) in formal interviews regarding the cognitive and affective impact of the exhibit. In addition to asking if visitors understood how to operate devices, the project evaluator will ask significant numbers to complete questionnaires that help ascertain the exhibit's educational impact.

Evaluation data is reviewed in cooperation with project advisors at the end of each 2-3 week cycle. Devices rated high in achievement of operational and educational objectives undergo final modifications and are sent into final production. Devices rated medium to low in achievement of objectives undergo a process of refinement and further testing until a significant number of visitors express satisfaction and cognitive impact from hands-on experiences with the device.

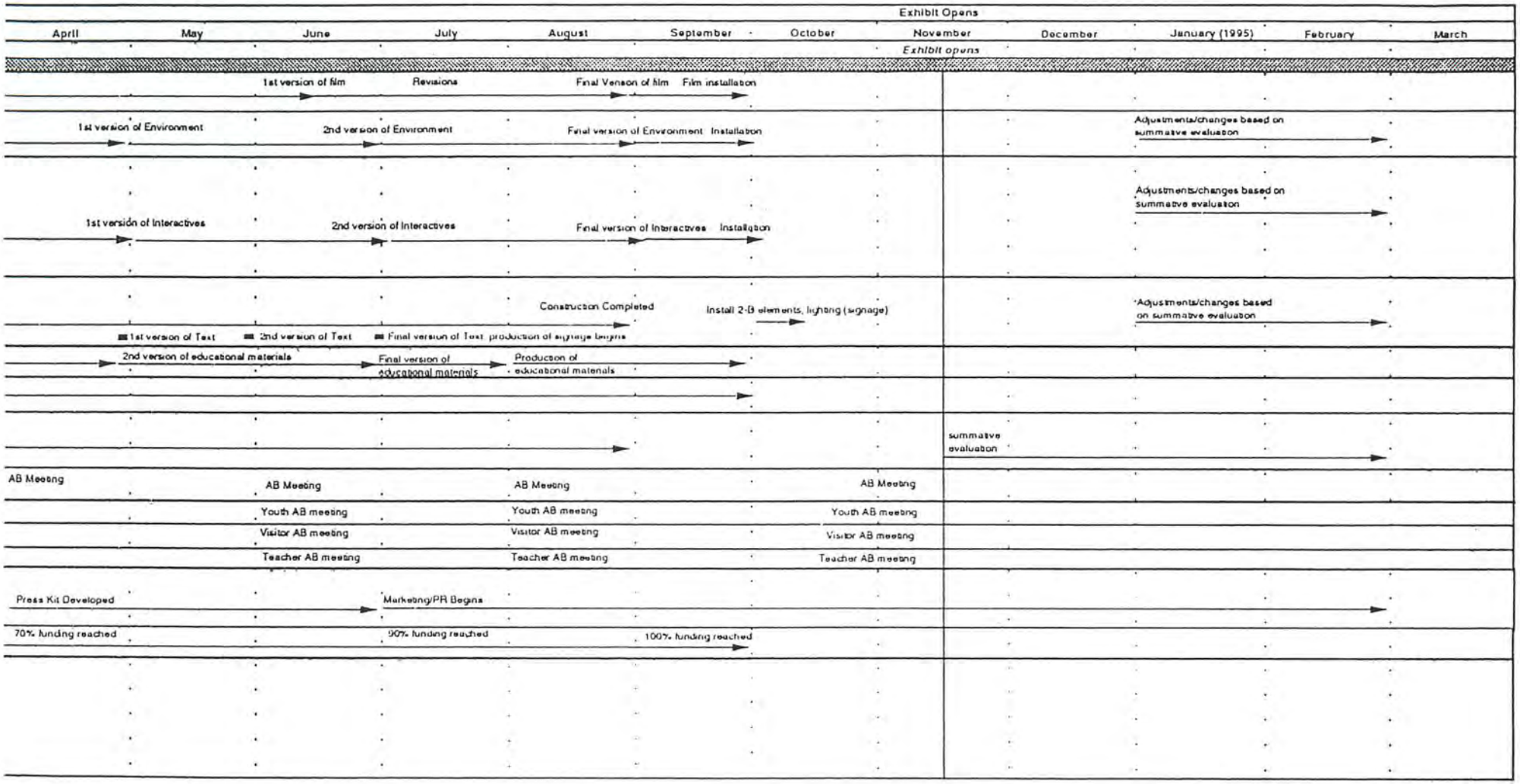
Summative evaluation studies will continue to test devices after the exhibit opens, guiding modifications to operational text and device design during a three-month period in the winter-spring of 1994-95. The Computer Museum aims to make all its exhibit devices understood by and accessible to novice and expert visitors alike. On a quantitative level, project directors will be able to estimate increase in the number of people who understand and use computer networks as a result of their exhibit experience based on the number of people who contact the Museum's own bulletin board after their museum visit. As is

consonant with the guiding principles of public science museum education, about 85% of devices in all Computer Museum exhibits are indeed accessible to a broad public audience with diverse computer literacy backgrounds.

Figure 1: The Networked Society Exhibit Timeline - June 1993 - March 1994

Major Milestones		Planning Period			Prototype, Evaluation, and Design Period				Implementation Period		
		June (1993)	July	August	September	October	November	December	January (1994)	February	March
Elements	Sub-elements										
Content/ Interactive Development	Part I: Introductory Film	Preliminary development of ideas/issues for film				Prototype development of film concepts - testing with visitors			Begin work with Film Production Group - Storyboard, collection of images, filming		
	Part II: A Networked Environment: Network Guides	Preliminary development of issues for interactive networked environment				Prototype development of interactive networked environment - Evaluate in Exhibit Lab Test tracking, networking software, people's comprehension of the concept			Implementation of Networked Environment - Evaluation continues		
	Part II: Real World Networks Remote Connections Network Lab Wired Home Education Government Finance Transportation Telephone Control Center	Preliminary development of issues for the Real World Networks				Prototype development of the Real World Networks Evaluate in Exhibit Lab Test links to outside world, tapping into networks, set up prototype control center			Implementation of the Real World Networks - Evaluation continues		
3-D Design/ Construction/ 2-D Design & Production	Exhibit Environment/ signage	Preliminary development of 3-D & 2-D design - basic floor plan, projections, signage			Construct Exhibit Lab Development for final 3-D & 2-D design - floor play, details for application areas, signage - Evaluated preliminary concept		1st review	2nd review	Final refinements of 2-D & 3-D design final review		Construction of 3-D, Production of 2-D Text development begins
Educational Activities	Ed. Packet	Preliminary development of Educational Packet			Preliminary work on Ed. Packet based on exhibit content development				1st version of educational materials/Evaluated		
	Training for VA's	Preliminary development of possible Educational activities tied to Part II: Networked Environment			Prototype Development of educational activities with exhibit lab				Training of VA's for educational activities within exhibit - Network Environment, Real World Networks.		
Evaluation	Interactive/Signage	Front-end evaluation of preliminary content/interactive/3&2-D development				Exhibit Lab opens Formative evaluation of content/application areas/interactives/2-D & 3-D design/educational activites/educational materials in Exhibit Lab					
Advisory Boards	Application Area/ Technology Advisory				AB Meeting		AB Meeting		AB Meeting		
	Youth Advisory					Youth AB meeting		Youth AB meeting			Youth AB meeting
	Teacher Advisory					Visitor AB meeting		Visitor AB meeting			Visitor AB meeting
	Visitor Advisory					Teacher AB meeting		Teacher AB meeting			Teacher AB meeting
Marketing/ PR		Market Research to find the topics people are interested in, what visitors feel is missing from the museum. Test and finalize name of exhibit. Begin promotion of preliminary interactive development to promote awareness of exhibit					Final Exhibit Names Selected Marketing/PR strategy Developed		Exhibit Name Finalized		
Fundraising		Pursue fundraising leads						50% funding reached			
New Staffing			■ Interactive Software Developer (Education/Government)			■ 1 Evaluator ■ 1 Administrator			■ Video/Software Developer (Networked Guides) ■ Network Tech/Software Developer (Remote Connections) ■ Network Tech/Software Developer (Network Lab) ■ Interactive Software Developer (Wired Home) ■ Interactive Software Developer (Finance) ■ Interactive Software Developer (Transp./Telecom.) ■ Educator Trainer (part-time) ■ Educational Materials Developer (part-time)		■ Exhibit Foreman ■ 2 Carpenters

Figure 2: The Networked Society Exhibit Timeline - April 1994 - March 1995



Results of Prior NSF Support: Oliver Strimpel

NSF award #: MDR 89-55342
Amount: $96,258
Period: 8/1/90 - 1/31/92
Title: Computer Exhibit Kits Program

Dr. Strimpel, Executive Director of the Computer Museum, successfully completed a project to reproduce and nationally distribute eight Computer Exhibit Kits to 20 science and technology museums across the U.S. The eight kit topics are hands-on and visitor-interactive in nature; they address fundamental principles in artificial intelligence, robotic sensing, computer programming, and voice recognition and creation. Each kit includes custom software designed by the Museum's exhibits staff; detailed instructions for installation, maintenance, and repair; blueprints for display; and educational materials for students, teachers, and parents. Rigorously evaluated front-end software installed in each Exhibit Kit provides satisfying experiences to visitors with diverse backgrounds in computer literacy.

Distribution of the eight Kits has continued with additional support from the Randolph Hearst Foundation and American Association for Artificial Intelligence. The Computer Museum has found that many science-technology centers desire computer-based exhibits to satisfy youthful audiences, especially adolescents. But few museums have the in-house expertise to design these devices, making computer-based exhibitry one of The Computer Museum's foremost contributions to the hands-on science museum profession.

Since the end of the effective NSF award period, The Computer Museum has developed an additional twelve kits (for a current total of twenty kits) and has marketed these to 43 museums. The Computer Museum estimates that five million museum visitors a year use the Computer Exhibit Kit series first made possible with NSF support.

Results of Prior NSF Support: David Greschler

NSF Award #: ESI 93-53670
Amount: $49,900
Period: 6/1/93 - 4/30/94
Title: Researching Virtual Reality as a Tool
for Informal Science Education

This SGER grant supports preliminary research into the efficacy of virtual reality as a tool for museum exhibitry. Using a virtual reality environment of a human cell, The Computer Museum will test exhibit prototypes and evaluate cognitive impact on diverse public visitors to ascertain whether: (1) people gain increased understanding of cell physiology, including a sense of scale, location and morphology of elements, and component interactions, and (2) people gain increased understanding of the concept of a "system" by interacting with the virtual world of a human cell. This project, now in its first months of program implementation, has already completed development of the prototype concept and schematics. The prototype is scheduled for on-floor evaluative testing in the Museum's evaluative "Exhibit Lab," starting in October of 1993.

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Biographical Sketches

Primary Co-Principal Investigator: Dr. Oliver Strimpel, Ph.D.

Dr. Oliver Strimpel, Ph.D. in Astrophysics from Oxford University, has been with The Computer Museum since 1984 and is its Executive Director. He was formerly the Curator of English National Collections of Mathematics, Computing, and Data Processing at the National Museum of Science and Industry, in London, England. Dr. Strimpel has published widely on topics related to computer education and impact, including Computers: An Introduction, published in London: Orbis Color Library of Science Series, 1985, and an article on "Computer Graphics" for the 1989 McGraw Hill edition of The Encyclopedia of Science and Technology.

Dr. Strimpel has been the driving force behind The Computer Museum's current Strategic Plan to build five cornerstone exhibits on computing history, science, and technology. Dr. Strimpel was the project leader and primary developer of the first and largest cornerstone exhibit, The Walk-Through Computer Exhibit, which received major support from the Alfred Sloan Foundation, DEC, Apple Computers, Inc., and AT & T. He will act as primary Co-Principal Investigator of the proposed project on The Networked Society museum exhibit.

Co-Principal Investigator: David Greschler

David Greschler, B.A. with Honors in Economics from Brandeis University, and now the Director of Exhibits, has worked primarily as an interactive exhibit software developer at The Computer Museum since 1990. Greschler formerly worked at MIT's Media Lab, and taught educational software design at Harvard Graduate School of Education. He has contributed to all four cornerstone exhibits completed to date in the Museum's Strategic Plan, and was the project leader for two cornerstone exhibits: Tools and Toys and Robots and Other Smart Machines. He will act as primary Exhibit Developer for The Networked Society.

BUDGET EXPLANATION PAGE

The Networked Society Exhibit - Full Budget					
ITEMS	TOTAL COST	NSF FUND	OTHER FUND	MUSEUM FUND	BUDGET JUSTIFICATION
A. Senior Personnel					
Dr. Oliver Strimpel, Executive Director @ 2 months	$15,833	$0	$0	$15,833	OS to work 2 months on project- NSF covers 0%, Museum 100%
David Greschler, Director of Exhibits @ 7 months	$25,667	$12,833	$12,833	$0	DG to work 7 months on project - NSF covers 50%
Others					
Educator Trainer @ 4 months	$13,000	$6,500	$6,500	$0	Training for VAs within exhibit - 4 months - NSF covers 50%
Evaluator @ 12 months	$30,000	$30,000	$0	$0	Evaluates Interactives - 12 months - NSF covers 100 %
Educational Materials Developer @ 6 months	$15,000	$7,500	$7,500	$0	Developer of Educational Materials - 6 months - NSF covers 50%
Collections Manager @ 3 months	$7,000	$0	$3,500	$3,500	Oversees the archives - 3 months - NSF covers 0%
Marketing Director @ 3 months	$10,000	$0	$5,000	$5,000	Oversees the Marketing - NSF covers 0%
Public Relations Manager @ 3 Months	$10,000	$0	$5,000	$5,000	Oversees Public Relations - NSF covers 0%
Exhibit Designer @ 8 months	$30,000	$15,000	$15,000	$0	Designer of exhibit - 8 months - NSF covers 50%
Others Total (7 people)	*$115,000*	*$59,000*	*$42,500*	*$13,500*	
Total Senior Personnel (9 people)	**$156,500**	**$71,833**	**$55,333**	**$29,333**	
B. Other Personnel					
Post Doctoral Associates (0 people)					
Other Professionals (10 people))					*NOTE: because a significant part of the exhibit is the development of*
					educational interactive software, a large portion of the budget is labor
Network Tech/Software Developer (Remote Connections	$40,000	$30,000	$10,000	$0	These four developers will develop clusters funded by NSF. Developers
Network Tech/Software Developer (Network Lab)	$40,000	$30,000	$10,000	$0	to start in Jan. & work for 15 months (time allocated exhibit
Interactive Software Developer (Wired Home)	$40,000	$30,000	$10,000	$0	opening for changes). NSF covers 75% of time starting in March.
Interactive Software Developer (Education/Government)	$35,000	$25,000	$10,000	$0	Other funds cover 25% of cost prior to NSF award
Video/Software Developer (Networked Guides)	$40,000	$0	$40,000	$0	These three developers are funded completely by non-NSF funding
Interactive Software Developer (Finance)	$35,000	$0	$35,000	$0	since their areas will be supported by other funds
Interactive Software Developer (Transp./Telecom.)	$35,000	$0	$35,000	$0	
Exhibit Foreman @ 9 months	$20,000	$10,000	$10,000	$0	These three construction-related individuals will be building the
Exhibit Carpenter @ 9 months	$18,000	$9,000	$9,000	$0	exhibit - NSF covers 50% of their costs
Exhibit Carpenter @ 9 months	$18,000	$9,000	$9,000	$0	
Graduate Students (0 people)	$0	$0	$0	$0	
Undergraduate Students (0 people)	$0	$0	$0	$0	
Secretarial- Clerical (1 person @ 6 months)	$12,000	$0	$9,000	$3,000	This person will provide administration support - NSF cover 0%
Total Salaries and Wages (A+B)	**$489,500**	**$214,833**	**$242,333**	**$32,333**	
C. Fringe Benefits (Calculated at 18 percent)	$88,110	$38,670	$43,620	$5,820	Fringe benefits are calculated at 18@
Total Sal & Wages & Fringe Benefits (A+B+C)	**$577,610**	**$253,503**	**$285,953**	**$38,153**	
D. Permanents Equipment					Permanent Equipment is for equipment that is not donated in-kind
15 computers @ $4000 each	$60,000	$30,000	$30,000	$0	The Museum expect 50% of computers to be donated in-kind. These
Networking Hardware	$20,000	$10,000	$10,000	$0	numbers reflect computers not donated in-kind: NSF covers 50%
Screen Projectors	$30,000	$15,000	$15,000	$0	
Cabinetry, wiring, ceilings, walls	$180,000	$108,000	$72,000	$0	This is based on 9 clusters at $20,000 per cluster: NSF covers 60%
Software	$50,000	$30,000	$20,000	$0	Software not donated in-kind: NSF covers 60%
Total Permanent Equipment	**$340,000**	**$193,000**	**$147,000**	**$0**	NSF covers 50%
E. Travel					
Domestic	$5,000	$2,500	$2,500	$0	Travel will be for visits to advisors, and contractors coming to site
Foreign	$0	$0	$0	$0	NSF covers 50%
Total Travel	**$5,000**	**$2,500**	**$2,500**	**$0**	
F. Participant Support Costs					
Stipend	$8,000	$5,000	$3,000	$0	$1000 total stipend per advisor. 3 advisors are humanities related
Travel	$5,000	$2,000	$3,000	$0	and will be paid from NEH grant. 5 advisors are science related and
Subsistence	$5,000	$2,000	$3,000	$0	will be covered by NSF. For non-local advisors, $1000 allocated
Other	$0	$0	$0	$0	for subsistance and $1000 allocated for travel.
Total Participant Cost	**$18,000**	**$9,000**	**$9,000**	**$0**	
G. Other Direct Costs					
Materials and Supplies	$0	$0	$0	$0	
Publication Costs/Documentation/Dissemination	$50,000	$50,000	$0	$0	For publication of ed. Materials. NSF covers 100%
Consultant Services	$0	$0	$0	$0	
Computer (ADPE) Services	$0	$0	$0	$0	
Subcontracts	$75,000	$0	$75,000	$0	Introductory Film: To be funded by other funds - NSF covers 0%
Other	$70,000	$10,000	$60,000	$0	Installation/maintainence of Digital telephone lines for
					Remote connections cluster costs $10,000 - NSF covers 100%
Total Other Direct Costs	**$195,000**	**$60,000**	**$135,000**	**$0**	Marketing/PR costs are $60,000 - NSF covers 0%
H. Total Direct Costs (A through G)	**$1,135,610**	**$518,003**	**$579,453**	**$38,153**	
I. Indirect Costs					NOTE: 18% of Direct Costs but does NOT include Salary/Wages/Fringe
Overhead @18% (does not include salary/wages total)	$100,440	$50,220	$40,176	$10,044	NSF covers 50% of overhead, Other funding covers 40%,
Total Indirect Costs	**$100,440**	**$50,220**	**$40,176**	**$10,044**	Museum covers 10%
J. Total Direct and Indirect Costs (H+I)	**$1,236,050**	**$568,223**	**$619,629**	**$48,197**	
K. Residual Funds	$0	$0	$0	$0	
L. Amount of the Request (J)	**$1,236,050**	**$568,223**	**$619,629**	**$48,197**	
		46%	50%	4%	Percentage of Request

The
Computer
Museum

300 Congress Street
Boston, MA 02210
(617) 426-2800

Memorandum

DATE: October 18, 1993

TO: The Computer Museum Board of Trustees

FROM: Oliver Strimpel

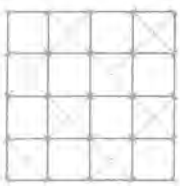
SUBJECT: *Networked Society* Exhibit; NSF Proposal

Enclosed please find a copy of the proposal for *The Networked Society* that was recently sent to the National Science Foundation for funding consideration. This major new exhibit, which is slated to open in November 1994, will highlight computer networks, their applications, and how they affect people's lives. Attendees at the Trustees meeting on October 15 felt that Board members might enjoy reading the NSF proposal in its entirety.

We welcome your comments on the proposed exhibit, as well as any suggestions you might have regarding potential funders for this important project.

I wish you good reading!

Enclosure



The Networked Society

Outstanding Request	Amount	Exhibit Area	Sub. Date	Dec. Date
N.E.H.	50,000	General	May-93	Nov-93
N.S.F.	568,223	General	Oct-93	May-94
S.W.I.F.T.	100,000	Finance	May-93	
NYNEX	100,000	General	Oct-93	Dec-93
Stratus	100,000	3 Areas	Nov-93	
In The Works	**Amount**	**Exhibit Area**		
Lotus	100,000	General/office		
Microsoft	100,000	General/office		
Teleport	In-kind	FO connection		
HCHP	25,000	Medical		
Rockwell				
Chipcom	Dave Fowler			
Cisco	trying to set			
AT&T	meetings			
Sprint	"			
Adobe	"			
Walmart ?				
Alamo ?	Chuck Geshke			
CompuServe ?				
November Mtngs.				
3Com				
Synoptics				
Unisys				
Oracle				
Banyan Systems	~~[illegible]~~			
	Dave Mahoney			

THE NETWORKED SOCIETY: AN OVERVIEW

Exhibit Goals:

1) To show the applications of computer networking
2) To demonstrate the technology of computer networks
3) To show the impact of computer networking

Design and Development Principles:

- The primary visitor experience should be activity-based.
- There should be a variety of experiences.
  - -- It should be different than what people do in other parts of the museum
  - -- There should be more opportunity for visitors to interact with VA's
- There should be a common beginning.

Exhibit Layout: (5 basic sections)

1) Introductory Film: From the point of view of a piece of data

What is a network?
How are they used?
Where did they come from?
Where are they going?
How do they impact the world around us?

2) Logging In: People pick their network guides and are give a barcode card.

Network Guides (characters from different ages, backgrounds, and languages) will follow people through the exhibit - they show up each time a person uses an interactive. They tell visitors about:

- -- the interactive they are going to use
- -- some of the information in the interactive
- -- some of the topical issues raised by the interactive
- -- which interactives the visitor has used and the ones that have yet to visit.

3) The Networked City: Applications, Impact and Technology

- A series of "hyper-real" settings that show different uses of networking
- Different clues give people a feeling for the area they are in:
  - -- objects (furniture, computer equipment)
  - -- sounds
  - -- interactive: large projection screen showing example of setting (like an attract screen)
- To interact in the area visitors swipe their card - they are engage in a series of activities, three different types:
  - -- About how it works
  - -- About how it is used.
  - -- Impact

Example Area 1: Air traffic control
Setting: Air traffic control room
-- Sounds of air traffic controllers
-- Images of airplanes
-- Monitors with radar screens
-- Large projection of air traffic controllers working

Air Line Reservation
FAA Conjestion Control
Bos TCA feed

Activity: Network guide introduces people to the FAA network. Visitors then see the most current update of all the aircraft in the air. They can choose to see certain areas of the country, and can find out how the FAA network works.

Example Area 2: Home/Office
Setting: A long space that starts as an office and merges into a home.
-- the office has desks, chairs and PCs, the home has a television and a couch
-- office has sounds of people typing and talking on the phone, home has sounds of someone cooking, the television playing, kids yelling.

Activity: Visitors in the office interact with visitors in the home. The home visitor is told by their network guide that they are working at home today because they're out sick with the flu (only a mild case!). The visitors work together on a joint presentation, each sending the other pieces of information the other needs. The office visitor uses a PC while the home visitor uses a television.

~~Swift~~ FedEx or L.L. Bean

Example Area 3: Finance
Setting: A broker house
-- sounds of stock brokers yelling out sales and purchase request
-- images of stock quotes moving along "ticker tape" boards
-- wall with different names of cities of cities and monitors representing the financial markets in those cities

GAP - design cycle for GAP

Activity: Visitors play the role of speculators using networks to buy and sell stocks and currency. The network guide shows up on one of the monitors representing a financial market and tells the visitor they have a certain amount of money to speculate with. The network guide moves from one financial market to the next, each time offering the visitor the opportunity to buy and sell. After "traveling" the globe, the visitor gets to see if they've become a millionaire or lost it all.

Other Areas:
- Credit Cards
- Health Care
- Education
- Telephone System
- Hotel/Car Rental Reservations system
- Traffic Control (distributed control network)
- Impact issues: Privacy

ATM card - give out CM bytes show what is on the card

Credit Card anyway - how it works even if not interactive

Swift - show the map with transactions of $ - 1 hr of real time recorded - visitor selects which country pair to watch

4) Remote Connections: A place for people to interact with real networks

- On-line services/bulletin boards (divided by category)
- Internet
- Videophone and network VR to other Museums, public spaces
- Bulletin board/FTP site for "remote"visitors -- show how it works
- Community social issue

5) Network Lab: The technical details of Networks

- Classroom setting
- Unassisted demonstration when no demonstration is happening
- Assisted in-depth demonstration - simulation of how to construct a network:
  - -- Addressing
  - -- Network structures
  - -- How information is packaged
  - -- Network operating systems
  - -- Network hardware

Internet examples:

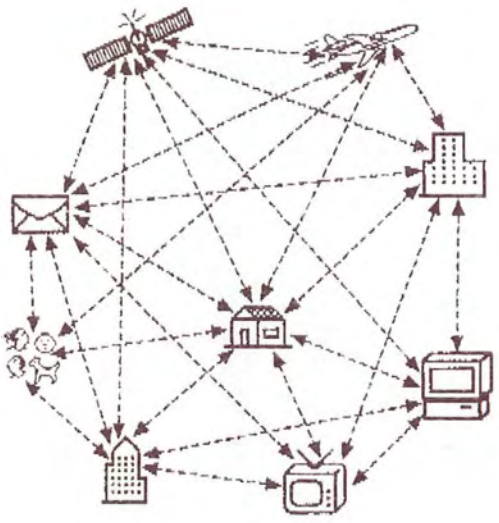
Science - CERN

CMU - coke machine

Novell interactive games

The Networked Society

A Museum Exhibit Designed to Promote Public Understanding and Use of Computer Networks



THE NETWORKED SOCIETY

In November 1994 The Computer Museum will open THE NETWORKED SOCIETY, the world's first museum exhibit solely dedicated to computer networking. This landmark 5,000-square-foot, $1.5 million exhibit will provide the public with an opportunity to discover the technology, applications and impact of computer networking, and will play a significant role in promoting the use of computer networks.

Stratus Computer has been a leader in the area of computer networking technology, recognizing early on its tremendous potential. Because of Stratus Computer's significant contribution to this area, The Computer Museum seeks to establish a partnering relationship for the development of THE NETWORKED SOCIETY exhibit. We envision Stratus Computer playing a leadership role in developing and sponsoring elements of the exhibit that demonstrate how computer networks are used to manage large-scale business applications.

The Computer Museum has had a number of discussions with John Goodwin of Stratus Computer to determine an appropriate exhibit application area for Stratus. As a result of our discussions, it has been suggested that The Computer Museum propose three possible scenarios where Stratus Computer can play a role in THE NETWORKED SOCIETY exhibit. What follows is a brief overview of the entire exhibit, followed by detailed descriptions of the three possible scenarios.

Stratus Computer's Participation: Three Possible Scenarios

Scenario #1) ***Applications of Computer Networks: Retail Systems***
The Application of Computer Networks is a section within THE NETWORKED SOCIETY made up of simulated environments (a bank, a store, a school) where visitors discover how computer networks are used on a daily basis.

One of the planned areas will demonstrate how credit cards and retail systems work. While most people use these systems on a daily basis, very few understand the intricate computer networking that supports their use.

In this area visitors will use their smart cards to "purchase" an item within the setting of a retail store. In response to this action, their "network guide" shows up the on the screen of their point of purchase (a cash/credit register) and says,

> "You've used a credit card to make a purchase. Let's see how networks are used to make sure you're in good standing with the credit card company. Watch the lights!"

Lights move along a wire towards a large projection screen on the wall of the store, showing how the information passes through the network from their point of purchase to other computers on the network. Their "network guide" then shows up on the large screen, demonstrating with video, computer graphics and running narration the twists and turns of the information as it goes through a series of networks and computers to confirm the credit request. Once the purchase request has been approved, the information returns through the network, jumping from the video presentation to the lighted wires within the store. As the lights stream back to the point of purchase, the "network guide" shows up again on the small screen on the cash/credit register and says, "Credit approved!"

The impact of the visitor "purchase" does not, of course, end with the credit verification. The "network guide" then goes on to explain how information about the purchase is networked to an inventory control system (lights would move across the store to a door with a "stock room" sign), impacting not only stock records, but also future ordering information. In this way, visitors learn that with the swipe of one credit card, they impact a whole series of computer networks.

How Stratus Would be Involved: As a leader in fault-tolerant systems, Stratus has played a significant role in the development of credit verification (American Express, etc.), in-store processing, sales transaction processing and warehouse/distribution management systems (the Stratus XA™2000 family of fault-tolerant systems), all mission-critical applications. The Museum would work with Stratus Computer to develop the demonstration of how credit verification and networked retail management works and to show how Stratus computers play a significant role in these processes. This would include placing a Stratus computer within the retail store setting to give visitors a hands-on experience with these systems.

Scenario #2) ***Applications of Computer Networks: Financial Systems***
In this area, visitors discover how the financial world uses computer networks to help increase the speed and efficiency of applications that require up-to-the-minute information and computer processing.

Placed within a stock-trading environment (stock quotes speeding by on the wall, multiple monitors flashing the latest financial information, sounds of stockbrokers screaming out purchase and sales requests), visitors will use their smart cards to make a financial transaction (purchase stock or currency). As a result of this action, their "network guide" will appear on a large monitor within the setting.

> "Did you know that when people buy stocks, their request is supported by a whole set of computer networks?"

Moving from monitor to monitor, each representing a different financial market around the work, the "network guide" will show how brokers use networks to get the latest stock and currency quotes and make purchase and sales requests.

> "For example, a broker in Tokyo (the "network guide" shows up on the Tokyo monitor) might use a network to get information about a stock in the Zurich stock exchange (the "network guide" moves to the Zurich monitor), and then based on that information would use a network to purchase a stock in the New York stock exchange (the "network guide" moves to the New York monitor). There's a lot of traveling going on, and it can take place in seconds! Computer networks have turned the financial world into a non-stop, 24-hour global market. "

How Stratus Would be Involved: With the significant presence of Stratus computers in the financial market industry, including its recent acquisition of Shared Financial Systems, Stratus Computer is clearly a leader in this area. The Museum would work with Stratus to develop this exhibit area to show how computer networks are used to increase the efficiency and speed of financial market applications, and highlight the significant role Stratus computers play in this industry.

Scenario #3) ***Remote Connections: Links to the Outside World***
After seeing how computer networks are used on a daily basis, visitors will enter an environment anchored by a large illuminated globe where they will connect, via networks, to people and information beyond the Museum's walls. This exhibit area will enable people who cannot visit the Museum to access some of THE NETWORKED SOCIETY's exhibit devices and text, and even join in some visitor activities.

The Remote Connections area fulfills the exhibit's goal of reaching an estimated 1.7 million people in three years through: (1) in-house exhibit explorations with Internet and diverse on-line services; (2) the Museum's own downloading capabilities; and (3) remote off-site connections to people in other museums and shopping malls (videophones, networked virtual reality).

In-house Exhibit Explorations: Visitors will explore the Internet using specially designed navigational software that introduces them to the many special interest groups and the vast amounts of information available on this massive network. Graphics will describe Internet history and growth, and explain how to join international conversations on topics ranging from astronomy to films. Visitors will also have experiences with many bulletin boards and commercial network connections, such as America On-Line, CompuServe, and ZiffNet. Videos will demonstrate the operation of these services.

Downloading: Anyone with a personal computer and modem will be able to access the Museum's own computer bulletin board and download diverse items including: signs and digitized images from THE NETWORKED SOCIETY; the collections catalog; samples of interactive exhibit software; and text and images from all five cornerstone exhibits at The Computer Museum. This information will also be made accessible over the Internet via a File Transfer Protocol (FTP) site.

Off-site Connections: Museum visitors will be able to directly interact with people in off-site locations including other museums, libraries, and shopping malls. Software now being developed by the Museum will enable distant users to communicate verbally and visually (cooperatively drawing pictures), as well as work together in a networked virtual world (jointly solving a design problem). Eight museums and libraries have already expressed interest in hosting remote connections sites for this national exhibit project.

How Stratus Would be Involved: Stratus Computer's participation in the Remote Connections area would be two-fold:

1) As a major provider of network computing for America On-Line, Stratus would work with the Museum to demonstrate in the exhibit how on-line services use large-scale computer systems to manage the vast amount of information processing and requests. As more and more people join on-line services, a display of this type would greatly benefit visitors.

2) Another component of the Remote Connections area is the downloading capabilities, allowing visitors beyond the walls of the Museum to access information in the exhibit. The Museum would work with Stratus Computer to develop such an application and place a Stratus computer running the application within the Remote Connections area to demonstrate how such a system works. This system would provide access to Museum information through three connections: i. A Museum bulletin board system, ii. gateways from commercial on-line services, iii. and an FTP site on the Internet.

FAX TRANSMITTAL

The Computer Museum
300 Congress Street
Boston, MA 02210

TEL [617] 426. 2800
FAX [617] 426. 2943

Date: 11/5

To: Gardner

From: Oliver Ext.

Number of pages (including cover sheet): 8

Notes:

Gardner -

Our Stratus contact, John Goodwin, just got laid off.

Enclosed are the scenarios we developed with him for Stratus' participation in the exhibit.

What do you think we should do now?

Oli

FAX TRANSMITTAL

Marketing and Promotion Opportunities

The Networked Society provides corporate sponsors with a unique opportunity to be associated with a highly visible exhibit about computer networks and their significant global impact. Sponsors will be part of a unique public education project, introducing people from all walks of life to the importance of computer networks, their tremendous effect on the world, and the possibilities they hold for the future.

The Computer Museum plans a major marketing and publicity campaign for *The Networked Society*. In connection with the exhibit, the Museum is planning a national print and broadcast campaign The Museum will work with sponsors to create cooperative promotional, advertising, and marketing efforts with area ad and PR agencies, hotels, and convention facilities, and to develop collateral materials and a retail merchandising program. Public Relation's efforts will be targeted to both trade and consumer market segments on a national level.

Since 1988, PR efforts for the Museum have resulted in over 860 million media impressions in 63 countries. *The Walk Through Computer* has generated over 350 million media impressions worldwide. Initial media impressions immediately following exhibit openings for *Tools & Toys* and *People and Computers* were 10 million and 38 million respectively.

Sponsor Benefits

Benefits and privileges are designed to ensure that all sponsors of *The Networked Society* receive appropriate levels of recognition based upon their level of commitment to and involvement with the exhibit.

Major sponsors of *The Networked Society* will receive prominent acknowledgment in published materials and communications regarding the exhibit including press releases, ad campaign (see below), gallery leaflets, opening invitations, Museum publications (newsletters and Annual Report), educational materials for school groups, electronic materials on monitors of on-line resources and activities posters Sponsors will be prominently listed on credit panels placed in the exhibition.

In addition, major sponsors of *The Networked Society* will be included in a special series of promotional advertisements to be placed in industry and business publications prior to and following the exhibit's opening in November 1994. The Museum will request full-page, four-color advertisements in leading industry, business, and news publications to promote the new exhibition. The Museum has successfully solicited over $500,000 in free advertisements from more than twenty publications, including Business Week, Fortune, Byte Magazine, Computerworld, MacWeek, and PC World

Major sponsors will receive a Corporate Membership to the Museum, a unique resource for corporate leaders, employees, customers, and their families. Corporate membership benefits include special arrangements for use of the entire Museum for conferences, meetings, and parties, invitations to the Museum's Corporate Breakfast Seminar Series, and access to the Museum's document and video collection. Sponsors will also receive VIP tickets for the Museum's exhibit opening.

DRAFT

October 25, 1993

Dear Dr. Khanna:

Laura Morse recently informed me that you are interested in participating as a member of the Advisory Committee for our new exhibit, The Networked Society. We are delighted that you are willing and able to lend your experience and expertise to this project.

Scheduled to open in November 1994, this $1.5 million, 5,000-square-foot interactive exhibit will play a significant role in promoting public understanding and use of computer networks. The Computer Museum has a successful history of developing interactive, educational exhibitions and programs about computer technology. Again, with The Networked Society The Museum will present an exciting project that will foster public appreciation and understanding of this emerging technology.

Although being ~~in~~ at S.W.I.F.T. in Belgium will certainly limit your time and availability, I do want to extend an invitation to attend our next Advisory Committee meeting on November 1 from 6-8 p.m. at The Museum in Boston.

I have enclosed some information about The Museum and the proposal sent to the National Science Foundation which details the exhibit. I will call you soon to discuss it further and to learn more about your particular interests.

Thanks again for your willingness to participate and welcome to the Committee.

Sincerely,

Gardner C. Hendrie

Global Payment Systems — SWIFT

New CIO — Dr. Kailash Khanna

age 55

Kailash is on Lots of CIO committees

(+) American Express – VP Strategic Systems
American Airlines – Res.
most recently Chemical Bank

(Naomi Seligman was a reference)

Post-It™ brand fax transmittal memo 7671 | # of pages ▸ 1

To Betsey Riggs	From Gardner Hendrie
Co. CMJ	Co. 10/20/93
Dept.	Phone #
Fax #	Fax #

ITEM	ACTIVITY/MAIN POINTS	FUNDING POSSIBILITIES
Introductory Film	People watch intro movie: •What a computer network is •Computer network applications •How computers are connected •Where networks came from •How networks impact us	
Group Experience: A Networked Society	•A networked interactive movie •Visitors are tracked - as they move from one station to another, the network recognizes them and they are introduced to different applications of networks	
Utility Management: Central Artery Traffic Control Center	A traffic-control center - •video feed of traffic, voice of state police and other traffic monitors •Visitors get to control traffic in simulation	
The Network Lab: Build Your Own Network	A laboratory setting where people can build a network using clients, servers, hubs, routers, modems, and cables. - create a LAN or WAN.	
Communications: Telephone Control Center	A telephone control center - •Visitors get to control telephone traffic in a simulation •Visitors get to track a call through the telephone system	
Wired Home	A home setting where people see different home uses for computer networks - entertainment, data. •Order up a movie •Home shopping •Send mail over cable	
Finance	•Visitors get a bird's eye view of SWIFT •See how a credit card or ATM card is processed	
Government	•visitors will be able to gain access to different government networks • send electronic-mail to their government representatives.	
Education	•Tap into Kids Network •Distance learning •Tap into educational databases	
Airlines	•Bird's eye view of SABRE •Visitors use FAA network to see aircraft in the air at the moment	
Health Care	•Visitors play role of doctors and share medical data - Ultrasounds, MRIs - across the lines •Visitors see how insurance forms are processed by networks	
Retail	•Visitors make purchase by scanning in products and watch how the information impacts inventory and ordering	Walmart
Manufacturing	•visitors play the role of a technical support person and communicate via video and prerecorded video sequences to explain to a visitor on the other end how to accomplish a task	
Remote Connections	•Connection to Internet, bulletin board systems, and commercial on-line services •Teleconferencing •Chat lines •FTP/BBS site where remote visitors can log into exhibit - connections to commercial database "visit The Computer Museum on CompuServe"	

Picturetel

THE NETWORKED SOCIETY ADVISORY COMMITTEE MEETING

9/13/93

AGENDA:

1) Review the objective of the exhibit?

2) What are some compelling stations for the exhibit and who are the natural potential funders for each station?

4) Next meeting?

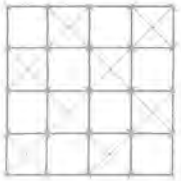
The
Computer
Museum

300 Congress Street
Boston, MA 02210
(617) 426-2800

The Computer Museum

BOARD OF TRUSTEES MEETING
October 15, 1993
8:30 a.m. - 12:00 p.m.

8:30	Call to Order of Meeting of the Members of the Corporation
	Election of Members of the Board of Trustees
	Meeting Adjourns
8:45	Call to Order of Meeting of the Board of Trustees
	Election of Members of the Board of Overseers
	Vote regarding delegation of authority to the Executive Committee
	Museum Update
	Strategic Plan — Discussion
12:00	Meeting Adjourns
	Lunch



September 28, 1993

To: Gardner Hendrie
Paul Severino
Ed Belove
Howard Salwen
Jim McKenney

Fr: Oliver Strimpel

Re: "The Networked Society" Exhibit

Many thanks for participating in The Networked Society Advisory Committee meeting September 13th.

Good news: we secured an additional $50K of support for the exhibit from Sun Microsystems.

Meeting minutes, a copy of the corporate proposal, and a copy of Paul's letter to corporations are attached. Here is a list of action items you all undertook.

Action Items

Paul Severino:
telephone follow up to letters
new letter to Thomson Financial, NASDAQ, and Compuserve

Ed Belove:
contact Compuserve, Lostus - K.C. Branscombe at Agenda, Prodigy, America On-Line
contact at General Electric

Howard Salwen:
contact at Merril Lynch

Jim McKenney:
contact Bay Bank, GAP, Federal Express

Museum staff:
NSF, Microsoft, NYNEX, 3COM, Harvard Community Health Plan, and Stratus

If you need additional copies of anything, please let us know.

We look forward to seeing you 6-8 pm on November 1st at our next meeting!

The Networked Society
Advisory Committee Meeting
September 13, 1993

The Advisory Committee for The Networked Society met at The Computer Museum September 13, 1993. Advisory committee members in attendance were: Gardner Hendrie, Paul Severino, Howard Salwen, Ed Belove, and Jim McKenney. Museum staff members in attendance were Oliver Strimpel, David Greschler, Betsy Riggs, Carol Welsh, and Kristan Cardoza.

The committee decided to focus on individual exhibit activities and their potential funders rather than on the exhibit's overall objectives. David will determine how activities will work together to form a cohesive and meaningful exhibition. The committee looked at each component of the exhibit.

Introductory Film:
In addition to telling how networks work, committee members suggested that the film present a history – where the technology started and where it's going. One member recommended that the Museum get a copy of AT&T's video, which includes an interesting look at the future. The committee agreed that the film should be immersive, similar to an IMAX film; the visitor should be made to feel like a piece of information traveling through a network. Funding sources mentioned were AT&T, Lotus, InterOp, MCI, Sprint, and Time Warner.

Group Experience, A Networked Society:
The committee suggested other ways to track visitors, including bar codes, paper with magnetic strips (like a parking stub), and finger prints. It was also suggested that visitors' images be captured and that the images move with them from monitor to monitor as they move throughout the exhibit area. This area would be the backbone network for the entire exhibit. Possibly the Museum will find a company to underwrite not only the exhibit area but also to upgrade the Museum's own system.

Novell is currently funding this exhibit at $100,000. Suggestions of other corporations to approach included Cabletron, Synoptics, 3Com, and companies which manufacture scanners.

The Networked Lab:
It was agreed by all committee members that this exhibit area needs to be reworked. The process of building a network is too complex for visitors; instead, visitors might "control" a network. The flow of information through the network and its components might be represented with the images of fish. (i.e. fish swim fluidly from monitor to monitor as they move through the network; they become bottle-necked when the network is not connected properly.)

Committee members felt that the area should include information about software as well as the hardware. It should describe about how a network works; how information travels through a network; how multiple conversations take place; how information is packaged and addressed. A 7 layer model should be considered.

Funding sources suggested were Banyan, Cabletron, Cisco, and Synoptics.

Central Artery Traffic Control:
Committee members expressed concern about how this fit into the overall exhibition. Rather than eliminating this exhibit area entirely, the committee left it to the Museum to determine how it could work within the exhibit. The committee will discuss this further. It was suggested that Museum staff look at cities which have complex traffic control networks such as Los Angeles.

Communications: Telephone Control Center:
The committee expressed reservations about this exhibit area as well. Members suggested that area focus on how the telephone system provides an important infrastructure for computer networking and how this infrastructure works. Several people recommended the Museum look at the EDS network control center as a superior example of an exciting control room. Companies to approach for support, in addition to NYNEX, are Teleport, MCI, Sprint and Merril Lynch.

Wired Home:
This area must make the distinction between a "wired" home and a "smart" home, both of which should be included in the exhibit. Companies which should be approached for support are General Electric, cable companies, Echelon (which has been working on smart home technology), and Bell Laboratories.

Finance:
Committee members by and large thought it was an interesting area. It was suggested that it include information about currency exchange; members felt it was a topic too few people understood. Museum staff is currently approaching S.W.I.F.T. and Stratus for funding. Other companies which should be approached are Fidelity, Thomson Financial (Andy Mills), Bay Bank, Merril Lynch, Cirrus, NYCE , Compuserve, and NASDAQ.

During this discussion other interesting network applications were mentioned including those of Federal Express and UPS. Both companies should be approached for possible funding.

Government:
This exhibit area will highlight government networks and will provide a good platform for talking about the Internet. Visitors can look into government on-line services and databases and will be able to send e-mail to the President and Vice President. The exhibit will include something about the Information Super Highway and what it means for people in the U.S.. Someone from the White House will visit the Museum on October 3 to look at the e-mail the President exhibit. The Museum anticipates that funds for the NSF will cover this section of the exhibit.

Education:
This area still needs a lot of work. There are many interesting things happening at universities, elementary school classrooms, and libraries such as the Boston Public Library. As part of this exhibit, the Museum hopes to tap into some of these. The

Museum anticipates funding for this area will come from the NSF and from private foundations.

Airlines:
The committee suggested that the Museum look at American Airlines, Delta, United - Covia and Airport of the Future and the companies that develop advanced airline reservation systems. They did not feel that SABRE was the best system to include in the exhibit. The group suggested might be a computer station where individuals can access airline reservation systems and purchase tickets by themselves. Some committee members expressed concern that too many of the exhibit areas would become alike, having visitors operate machines very similar to ATM's.

Health Care:
Oliver and David are currently approaching Blue Cross and Harvard Community Health Plan.

Retail:
A suggestion was made that the group look into the GAP. They have a very interesting system that enables them to efficiently track the product line from design to production to sales to inventory.

Manufacturing:
A suggestion was made to look at how networks control oil pipelines and electricity. Companies to consider for support are Mobil and Boston Edison.

Remote Connections:
The committee suggested the Museum approach on-line services, such as Compuserve, Prodigy, and America On-Line, for support. This area should include information on how people can access different networks. In addition, to demonstrate the exhibit's own network, as visitors exit they will use their smart cards to obtain a print out of all the networks with which they have interacted.

The committee meeting closed with a recommendation that issues of privacy and the risks associated with the growth of computer networking be addressed in the exhibit. A major component of the exhibit is the social/ethical implications of computer networking.

The committee scheduled a follow up meeting for Nov. 1 at 6:00 at The Computer Museum. In the interim, committee members and museum staff will pursue prospective funders and continue with the exhibit development.

Executive Summary

The Networked Society

An exhibit at The Computer Museum on the Global Information Infrastructure

The Computer Museum is creating *The Networked Society*, the world's first exhibit on global networks. This major new exhibit will highlight:

- The applications of global networks
- The technology of computer networks
- The impact of the Global Information Infrastructure.

This 5,000-square-foot, $1.5-million exhibit will open in November 1994.

***The Networked Society* exhibit will consist of eight application areas.**
These areas (e.g. Health Care, Retail, Finance, Education) will demonstrate the different uses of computer networks and will be linked by an actual network. Within each area, visitors will:

- Use a smart card to personalize and track their interactions in the exhibit;
- Activate hands-on stations where they will use real networks to discover the vast worlds of information they can access using computer networks;
- Collaborate with visitors, both within the exhibit and at off-site locations around the world;
- Face issues related to the impact of networks and discover the workings of this important technology.

***The Networked Society* exhibit will attract people who are directly impacted by global networks.**
The exhibit will be seen by over one million visitors during its life at the Museum, as well as an additional one million visitors a year through outreach programs. This includes decision-makers who will use the exhibit to better educate themselves about networks.

A major marketing and promotional campaign is planned for *The Networked Society*, including cooperative efforts with exhibit sponsors.

***The Networked Society* provides a unique opportunity for sponsors.**
They will be associated with a highly visible educational exhibit about the Global Information Infrastructure, one of the central issues of this decade. Sponsorship opportunities include:

- **Principal Sponsorship** ($250,000 and up) provides an opportunity for sponsors to take a leadership role in the development of the exhibit.
- **Application/Technology Sponsors** ($100,000) provides an opportunity for sponsors to support an area of the exhibit related to the industry in which they are involved.

The Networked Society

An exhibit at The Computer Museum on the Global Information Infrastructure

Computer networks are everywhere, playing a crucial role in how we communicate, collaborate, monitor, strategize, and share all kinds of information. They control the lights in our buildings, oversee the traffic we fight on our way to work, and record transactions of all sorts, from stays at hospitals to purchases at the corner store. They are an essential part of living in the modern world.

This is just the beginning. Strategic alliances are now being struck between unlikely partners that will break down traditional distinctions among television, telephones, and computers. This will change how we do business, get our news, shop, interact with others, and enjoy entertainment. One day soon, we all may be linked by a grand "information superhighway" network. This stream of data, voice, video, and three-dimensional images will reach into our homes, workplaces, and any point in between.

However, because computer networks are, for the most part, *invisible,* most people do not know how they work and how much they influence their lives.

To make this invisible infrastructure *visible,* The Computer Museum is creating *The Networked Society,* the world's first exhibit on global networks. This major 5,000-square-foot, $1.5-million exhibit will open in November 1994.

The Global Information Infrastructure is one of the central developments of this decade. It is essential that people be made aware of ways in which it will touch their lives. *The Networked Society* exhibit will play a significant role in promoting public understanding of this topic.

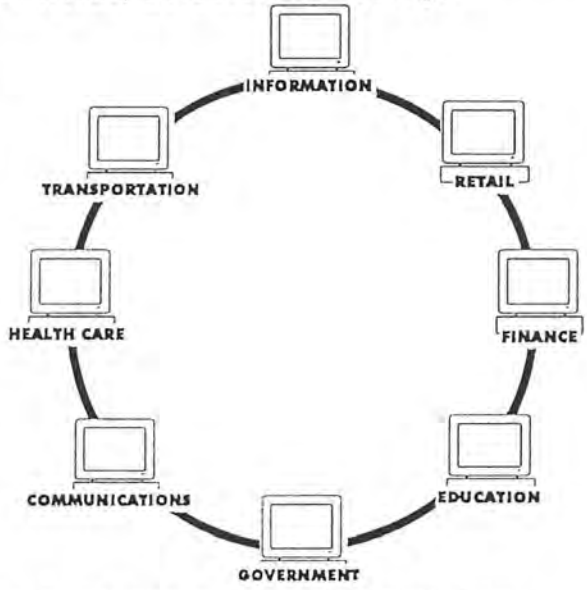
Making the Invisible Visible.

The Networked Society exhibit will reveal the Global Information Infrastructure by:

- Providing hands-on experiences with a variety of computer network applications.
- Explaining the technology of computer networks.
- Raising questions about the social and ethical implications of computer networks.

To accomplish these goals, the exhibit will be designed as a representation of the Global Information Infrastructure – in other words, a *Networked Society.*

Divided into eight different application areas but linked together by an actual network, the exhibit will consist of vivid interactive environments highlighting different uses of computer networks.



Each area will consist of a series of interactive stations where visitors actively learn about the applications, technology, and impact of networking.

The Visitor Experience

From the beginning, visitors will experience a mix of reality and fantasy. Real information and actual networking technology will be combined with hands-on activities that simulate real-world experiences with global networks.

Logging In

Visitors begin by logging into the infrastructure. Typing their first name into a computer, they choose a pseudo-identity – age, sex, job, income, history – that is issued on a smart card. As they move through the exhibit, they will use this card to personalize and record the different activities they participate in.

Application Areas

Card in hand, visitors enter the *Networked Society* via one of eight application areas. *For example: The communications application area will be set up as a telephone control center. Visitors will be surrounded by large projections showing the telephone traffic around the world as displayed in a network control center. They will see multiple screens with colorful images of different areas of the world, each with flashing lights indicating different levels of telephone traffic.*
This vivid setting will be the starting point for further discovery. Inserting their smart card into state-of-the-art computer stations, visitors will face real-world scenarios that will further involve them in the application being highlighted. *For example: Visitors encounter a scenario where suddenly a great demand is*

placed on phone circuits in a certain part of the country (such as is the case on Mother's Day). As people do in real communications control centers, visitors will respond to this problem by using a network to re-route calls through circuits having less demand.

Interaction with Visitors

Visitors will also use networks to communicate with other visitors in the exhibit to solve joint problems. *For example: In interactive stations highlighting the use of LANs and WANs, several visitors will be part of a scenario where they will be "located" in different parts of the world. Using the network that links them together, they will jointly develop a plan to resolve a crisis, while watching how the information they generate and receive is routed through the network.*

The exhibit will employ the latest videophone technology to connect visitors with people at different off-site locations around the world, including other museums, shopping areas, and city halls. Using a system now being tested by the Museum, visitors will interact with these off-site visitors using video images and drawing tools to perform a joint activity, such as drawing a picture of what they think the computer of the future will look like.

Social and Ethical Issues

The exhibit will also demonstrate the impact this technology will have on the way we work, play, interact with others, and think about ourselves, highlighting issues such as telecommuting, privacy, and the changing nature of communication. Visitors will face these social and ethical issues and make choices about the rights and responsibilities of being citizens in a Networked Society. *For example: When visitors log in with their cards for the last time, they will get a detailed record of all their interactions within the exhibit. This will give them a helpful review of the exhibit, while also graphically illustrating how the technology has tracked their choices and movement without their knowledge.*

The Technology of Networks

Each application area will also give visitors an understanding of the technology involved in networking. Since the exhibit itself is a network, there will be many opportunities to demonstrate the hardware and software running the system. Topics such as protocols and routing and comparisons of different networking media will be highlighted as part of the interactive experience. *For example: To learn about the concept of bandwidth, visitors in the information application area will experiment with the bandwidth of the cable entering a TV. As they limit the flow of data, they will discover how the quality of the picture changes.*

Audience Reach

The Computer Museum has a broad audience of students, families, and computer industry professionals, including computer industry leaders. *The Networked Society*, therefore, will attract visitors who will be directly impacted by the growing Information Infrastructure, including decision-makers who will come to the exhibit to better educate themselves about networks.

One million people will visit this permanent exhibit during its life at the Museum. An additional one million people will be reached each year through outreach programs, including:

- *Educational Activity Packets:* bilingual educational materials about the Museum's exhibits disseminated to teachers nationwide as a supplement to their curricula.
- *Exhibit Kits:* software packages of the Museum's most popular interactive stations. Over 30 Exhibit Kits have been placed in Museums around the world since 1991.
- *Exhibit Videos:* educational presentations based on exhibits distributed to educators and individuals. Over 10,000 copies of the Museum's video *How Computers Work: A Journey Into the Walk-Through Computer*™ have been sold nationwide.

Marketing and Publicity

The Museum plans a major marketing and publicity campaign for *The Networked Society*. The print and broadcast campaign will include newspapers, magazines, TV and radio. The Museum will work with its sponsors to create joint promotional programs, including press releases, PSAs, advertising, billboards, and other collaterals. Cooperative promotional, advertising, and marketing efforts will be developed with area ad and PR agencies, hotels, tourist attractions, and convention facilities. All efforts will be targeted to both trade and consumer market segments on a national and international level. Since 1988, PR efforts for the Museum have resulted in over 860 million media impressions in 63 countries.

Building The Networked Society

In the last three years, The Computer Museum has opened three $1-million exhibits: *The Walk-Through Computer*™ (how computers work), *People and Computers: Milestones of a Revolution* (computer history), *and Tools & Toys: The Amazing Personal Computer* (computer applications). Each was developed in approximately 18 months. *The Networked Society* exhibit will follow a similar model, with most design (three-dimensional and interactive components) completed in-house with the help of technical advice from sponsors and individuals. The exhibit will cost $1 million, with an additional $500,000 of in-kind equipment support. This will cover the costs of research, planning, design, fabrication, computer programming, evaluation, and marketing/promotion.

Sponsorship Opportunities

The Networked Society provides a unique opportunity for corporate and individual sponsors to be associated with a highly visible exhibit about the Global Information Infrastructure.

The Computer Museum's broad audience mix assures a significant group of visitors who will be directly impacted by this infrastructure, including decision-makers who will use the exhibit to better educate themselves about networks.

All sponsors will receive prominent acknowledgement within the Museum and in published materials and communications regarding the exhibit, including the ad campaign, press releases, posters, Museum publications, and educational materials.

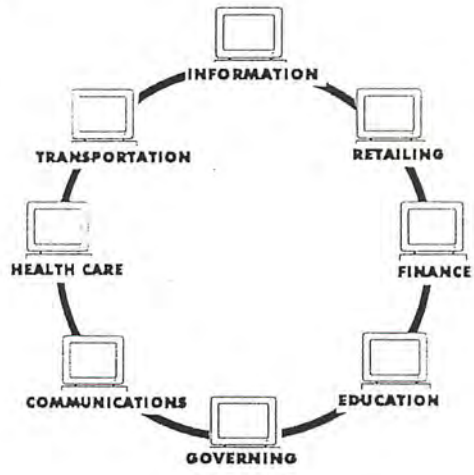
There are two levels of sponsorship:

Principal Sponsor ($250,000 and up)

Principal Sponsors will head the list of exhibit supporters. As *The Networked Society*'s lead donors, Principal Sponsors will be in a position to take a leadership role in supporting the development of this landmark exhibit. They will be prominently featured in all published material and promotions. They will be provided with 50 invitations to the exhibit's opening events and have the opportunity to hold a private opening event during the exhibit's preview week.

Application Area/Technology Sponsor ($100,000)

Application Area/Technology sponsorship provides an opportunity for sponsors to support an area of the exhibit related to the industry in which they are involved. Application Area/Technology Sponsors will be listed in all related materials and will be provided with 25 invitations to the exhibit's opening events.



Networked Society, a dynamic interactive exhibition to open in November 1994 at The Computer Museum in Boston, an organization where I have been a director since 1987.

This project will allow you the opportunity to reach new audiences and help demystify networking. The exhibit will reveal the invisible, mysterious world of networks, and convey the excitement of the future when interoperability and connectivity will provide new ways of working and playing.

The Computer Museum is eminently suited to undertake this project and I can assure you that it will attract wide ranging media attention. In 1990, the Museum opened The Walk Through Computer, a working two-story machine that dramatically shows how computers work. Since then, they have built exhibitions focusing on computer history, personal computer applications, and robots and artificial intelligence. They have over 125 interactive computer stations and are a small-scale software developer for other Museums. Their exhibit, development, marketing, and public relations staff is well qualified to produce a good exhibition that will have world-wide impact.

Please

- read the enclosed proposal and material about the Museum;
- chat with me about this exhibit when I call in the next few weeks;
- plan to visit the Museum and see it for yourself.

In 1984, I installed Ethernet through the Museum, starting a long and interesting involvement in this unique institution. Each activity has proved useful, and I hope you will join us in developing The Networked Society.

Regards,

Paul J. Severino

OS ✓
✓ Betsy Riggs
Kate

BY FAX

SMART VALLEY, INC.
4500 BOHANNON DRIVE
MENLO PARK, CA 94025 USA
DIRECT (415) 328-4575
FAX (415) 328-4585
INTERNET: HARRYS@NGC.COM

TO:	
CC:	
COMPANY:	
FAX NO:	
DATE:	Saturday, September 11, 1993
FROM:	Harry J. Saal, President and CEO

Sile of our

SUBJECT: COVERAGE OF GORE DINNER IN PALO ALTO HOME

I thought you'd like to see one of the articles which appeared following Gore's Smart Valley dinner. There was a small mention in the SF Chronicle, and very extensive coverage in the Examiner. Coverage continued on Saturday, as part of his Sunyvale meetings, wherein he referred to the discussions he had, the technology demos he saw and his strong interest in the Smart Valley model. There was also a cute human interest story about how the Mayor of Palo Alto stumbled onto this hush-hush dinner while walking her dog around the block!

San Jose Mercury News

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FRIDAY
SEPTEMBER 10, 1993

Gore gets show of high-tech toys in P.A. back yard

Gore

BY SCOTT THURM
AND LEE GOMES
Mercury News Staff Writers

Vice President Al Gore came to meet — and pick — the brains of "Smart Valley" Thursday night.

Dining at the Palo Alto home of Smart Valley Inc. President Harry J. Saal, Gore heard about the public-private group's ambitious plans to connect South Bay homes, schools, businesses, government agencies and community organizations by way of a high-speed digital computer network.

And in the back yard of Saal's home, the vice president — a well-known technology buff who has been known to pass the time wandering the aisles of supercomputer trade shows — went into full-blown hands-on mode with some of Silicon Valley's latest toys.

There were demonstrations by Cupertino's

See GORE, Page 21A

INSIDE

City Net, which links that city's schools; the Palo Alto library's computerized catalog; Mercury Center, an on-line news service of the Mercury News; and RadioMail, a wireless electronic mail service.

"We're going to talk about our agenda for the National Information Infrastructure," Gore said as he arrived, referring to the Clinton administration's plan for a computer network linking the nation. He added, "I'm going to learn from them."

That seemed to happen.

"He (Gore) was very interested in the technology we have in the valley," said Wally Dean, a Cupertino city councilman instrumental in setting up the City Net program. "I don't think he's seen these things elsewhere in the U.S."

Hewlett-Packard Co. President Lew Platt said the meeting, while breaking no new ground, still was mutually beneficial. He said Gore was able to point to a concrete example of the high-tech wonders he and Clinton promise, while Smart Valley executives won additional exposure and fund-raising potential.

Throughout the 2½-hour affair, about 100 neighbors gathered outside the Saals' two-story Mediterranean-style home on a tree-lined street. After dinner, Gore addressed the crowd briefly from his limousine megaphone, joking about his appearance on Wednesday night's David Letterman show and promising continued work to improve the California economy.

Gore ate a dinner of sea bass and purple potatoes with about 35 Smart Valley directors and others, including San Jose Mayor Susan Hammer, Santa Clara County Supervisor Ron Gonzales and Joint Venture: Silicon Valley chief Rebecca Morgan.

The private visit marked the start of a 24-hour blitz through Silicon Valley. Today, Gore will be joined by President Clinton for a tour of a Sunnyvale laser maker and for a community meeting to promote the White House plan to "reinvent government." None of the events is open to the public.

For Gore, the evening was a chance to make a hobbyist's call on a group of like-minded technologists helping bring to life to the national information infrastructure, a data superhighway that will one day transmit computer files, television signals, telephone calls and just about anything else over high-speed communications lines.

But the group was reminded of the pitfalls of technology when a security aide commandeered all of the home's phone lines, briefly cutting off access to the demonstrations.

Smart Valley is a spinoff of Joint Venture: Silicon Valley, a group of local business executives, government planners and others working to keep the region economically competitive.

Seth Feary, a Hewlett-Packard planner who is technology adviser to Smart Valley, said the group is developing specific uses for the increasingly potent digital communications tools being developed by computer and telephone companies.

One project, he said, will allow several large local computer firms to conduct their business over a network. Another will connect classrooms here and in Southern California, and will also give teachers the training needed to take advantage of these links in their curriculum.

Vice President Al Gore, right, arrives Thursday night at the home of Smart Valley Inc. President Harry J. Saal on Bryant Street in Palo Alto.

CLINTON AND GORE IN THE SOUTH BAY

Here are today's schedules for President Clinton and Vice President Gore. None of the events is open to the public.

- 11:45 a.m. Gore to tour the San Jose Mercury News.
- 12:55 p.m. Clinton to arrive at Moffett Field Naval Air Station on Air Force One.
- 1:30 p.m. Clinton and Gore to tour ILC Technology Inc. in Sunnyvale
- 2:30 p.m. Clinton and Gore to meet with employees at Sunnyvale Community Center.
- 5:30 p.m. Clinton and Gore to depart from Moffett Field.

Source: The White House

Hewlett-Packard Co. President Lew Platt said the meeting was mutually beneficial. He said Gore was able to point to a concrete example of the high-tech wonders he and Clinton promise, while Smart Valley executives won additional exposure and fund-raising potential.

strimpel @ tcm.org

THE NETWORKED SOCIETY ADVISORY COMMITTEE MEETING

9/13/93

AGENDA:

1) What are some compelling stations for the exhibit and who are the natural potential funders for each station?

2) Next meeting?

Privacy -
notes: @ Lotus
The Sierra Network - interactive network games

ITEM	ACTIVITY/MAIN POINTS	FUNDING POSSIBILITIES
Introductory Film	People watch intro movie: •What a computer network is •Computer network applications •How computers are connected •Where networks came from •How networks impact us	Paul S. route contact @ AT&T Dan Lynch - Gwen talk to - Interop sponsor
Group Experience: A Networked Society	•A networked interactive movie •Visitors are tracked - as they move from one station to another, the network recognizes them and they are introduced to different applications of networks	
Utility Management: Central Artery Traffic Control Center	A traffic-control center - •video feed of traffic, voice of state police and other traffic monitors •Visitors get to control traffic in simulation	
The Network Lab: Build Your Own Network	A laboratory setting where people can build a network using clients, servers, hubs, routers, modems, and cables. - create a LAN or WAN.	3Com show 7 layer model
Communications: Telephone Control Center	A telephone control center - •Visitors get to control telephone traffic in a simulation •Visitors get to track a call through the telephone system	EDS control room
Wired Home	A home setting where people see different home uses for computer networks - entertainment, data. •Order up a movie •Home shopping •Send mail over cable	Echelon - wired home Ken Oshman GE working on
Finance	•Visitors get a bird's eye view of SWIFT •See how a credit card or ATM card is processed	Jim McKinney knows Crozier @ Baybank Mike Simmons @ Bank of Boston Nasdaq
Government	•visitors will be able to gain access to different government networks • send electronic-mail to their government representatives.	good exhibit
Education	•Tap into Kids Network •Distance learning •Tap into educational databases Internet - Supercomputer Network	Libraries
Airlines	•Bird's eye view of SABRE •Visitors use FAA network to see aircraft in the air at the moment	Covia
Health Care	•Visitors play role of doctors and share medical data - Ultrasounds, MRIs - across the lines •Visitors see how insurance forms are processed by networks	show video transport of CAT scan HCHP
Retail	•Visitors make purchase by scanning in products and watch how the information impacts inventory and ordering	GAP automated system Walmart Stop & Shop
Manufacturing	•visitors play the role of a technical support person and communicate via video and prerecorded video sequences to explain to a visitor on the other end how to accomplish a task	~~GAP automated system~~
Remote Connections	•Connection to Internet, bulletin board systems, and commercial on-line services •Teleconferencing •Chat lines •FTP/BBS site where remote visitors can log into exhibit - connections to commercial database "visit The Computer Museum on CompuServe"	Time Warner in Fla Viacom in CA Continental - Sumner Redstone Cablevision

THE NETWORKED SOCIETY ADVISORY COMMITTEE MEETING

9/13/93

AGENDA:

1) What are some compelling stations for the exhibit and who are the natural potential funders for each station?

2) Next meeting?

THE NETWORKED SOCIETY ADVISORY COMMITTEE MEETING

9/13/93

AGENDA:

1) Review the objective of the exhibit?

Two Straw Men:

a) An exhibit about the applications, technology and impact of network technology.

b) An exhibit about large scale distributed computing applications; how they work and how they affect our daily lives.

2) What are some compelling stations for the exhibit and who are the natural potential funders for each station?

3) Next meeting?

THE NETWORKED SOCIETY ADVISORY COMMITTEE MEETING

9/2/93

AGENDA:

1) What is the objective of the exhibit?

2) What should be the major sections of the exhibit?

3) What are some compelling stations for the exhibit and who are the natural potential funders for each station?

4) Next meeting?

ITEM	ACTIVITY	PRIMARY MESSAGES	FUNDING POSSIBILITIES
Introductory Film	People watch intro movie	•What a computer network is •How computers are connected •How networks are used •Where they came from •How they impact us	
Group Experience: A Networked Society	People are given tracking devices. They log in at a computer and choose a network guide. They move from one computer to another - each represent an application of networks - and their network guide follows them and shows how they are impacted by networks. After 15 mins of this, the group goes into a debriefing space where a VA engages them in a discussion of the impact of computer networks on their lives.	•That computers can be networked - hooked up together - and that when this happens, the sum is greater than the parts: you can have data that follows you around. •The different applications of computer networks - how real people use them in their daily lives.	
Utility Management: Central Artery Traffic Control Center	A traffic-control center - video of traffic, voice of state police and other traffic monitors, computer network controlling pumps, signage, air quality in tunnels.	•How an activity all visitors use is controlled by a computer network •They get to "control" the network.	
The Network Lab: Build Your Own Network	A fenced-off space where people can build a network using clients, servers, hubs, and cables.	•How computers connect to each other •Network structures •Bandwidth	
Communi-cations: Telephone Control Center	A telephone control center - video of telephone traffic	•The telephone system is a computer network •It can be controlled, programmed, and data is transferred using computers	
Wired Home	A home setting where people see different home uses for computer networks - entertainment, data.	•The home is being impacted by computers •You can do things in the home visitors might think could have only be done in an office	
Finance	A space surrounded by projections of money flowing in many different directions at very fast speeds. Visitors get a bird's eye view of SWIFT, and see how a credit card or ATM card is processed	•How a credit card or ATM card is processed •There are vast amounts of finance flowing through computer networks at any single moment	
Government	A place where visitors will be able to gain access to different government networks, and will send electronic-mail to their government representatives.	•How governing is being impacted by computer networks.	
Education	Highlighting the ways people learn using computer networks.	•Distance learning •Shared and collaborative databases •How researchers use networks	
Airlines	Set in an airplane - people interact by bringing down the "tray" in front of them - revealing a computer.	•How the airlines use networks to manage visitor demand •How networks watch over aircraft traffic	
Remote Connections	An abstract setting with a global feel (the space is surrounded by images of the earth) where people use networks to talk to others and get data. This is where the FTP/BBS site resides so people can chat with remote visitors.	•How computer networks are impacting the way we communicate and get information •Connections to databases around the world •Connection to Internet and commercial on-line services	

APPLICATION AREA

	Banking/Finance/ Markets	Travel/Transport	Retail	Communications	Information Utilities	Manufacturing	Utilities/Control	Services	Government/Law
GLOBAL	S.W.I.F.T (Unisys)	***Airlines*** American Airlines, SABRE (IBM)		***Phone*** AT&T Sprint MCI ***Internet*** NSF DARPA Teleport			***Air Traffic Control*** FAA (Fu Assoc.) Dave Nelson flow control		
NATIONAL	Cirrus ***Credit Card*** Visa, Mastercard, Amex (Veriphone) Credit Checks	***Shipping*** Fed Ex Consolidated UPS	Walmart (Maycom) Waban (sp?) (IBM) Gap	RBOCs ***Research***	Dun&Bradstreet Dow-Jones (Thinking Machines) Mead ZiffNet Compuserve Reuters	Navistar Chrysler GM (EDS, IBM)	***Electricity*** Boston/Edison	***Health Care*** Humana ***Office Network*** (Novell,	FBI (NEC, NCR?)
REGIONAL			***Food*** Frito-Lay Taco Bell						
LOCAL	Bank of Boston (Stratus?)	Thomas Cooke Travel	***Groceries*** Stop & Shop Purity Supreme (NCR, IBM)				***Traffic Control*** Subway/train control Stop light (NYC?, Tokyo?)		

Fundraising Status for The Networked Society

Resp.	Company	Contact	phone	Next Step	Action Taken	Comments	Request
	Cisco	John Morgridge				Founders are from Data General have left company--Gardner	
	MCI						
	NYNEX			- send proposals		- offer menu between Networked and Clubhouse--	
	EDS						
	CONVEX					- transaction processing	
	Maycom					- do radio networking for Walmart	
	Tandem					- do ATM's direct competitor w/ Stratus	
	Frito-Lay					-- McKenney know anyone here?	
	Compuserve						
	Dow-Jones						
	Thinking Machines					Do Dow Jones text retreival	
	Mead						
	Dunn-Bradstreet						
	Prodigy						
	Sears						
	Toshiba						
	Fujitsu						
	Nippon Telephone &						
	Hitachi						
	Veriphone					Gardner knows?	
GB	NEC	Kobayashi		GB drafting ltr to Kobiashi	OS has written Unohara per suggestion of Eric Bloch	cc: to local folks	
GB	Novell	Bills		GB to send proposal	met here at Museum functions	- next time in Boston	
GB	Xerox	Seeley-Brown, Wiser		send proposal?	- GB met w/ Weiser - he will discuss w/ Brown		
GB	Cabletron			-GB to call Glenda for info.			
GB	Cadre Technologies, Inc.	Louis J. Mazzucchelli, Jr.	401/351-5950	- GB follow up	- OS met w/ WHEN?	- produce software team*work* used by Siemens to do automated	
GB	NetFrame	Enzo Torresi		- Gwen to meet or send proposal for $?	- Gwen saw at Shaeffer's conference-will give Netframe server		
G W	3Com	David Abramson		get local people over to see game -- get Benhamou over	- sent prop.v1.1 7/8/92 - OS visited Abramson in CA 7/13?/92	Abramson enthused-- - need to get game running well -	
G W	Sprint			GW to follow up w/ fellow from brainstorming		- McKenney contact at HBS on board	

Fundraising Status for The Networked Society

Resp.	Company	Contact	phone	Next Step	Action Taken	Comments	Request
GW	American Airlines	Max Hopper		GW oto write to revive		Approached a long time ago. - Ask Hopper to host	
GW	Chipcom	David Fowler		GW to call and send prop.		- Gardner invested there knows everyone--	
GW	QED	George Fosque	617/225-2510	- Greg call and send proposal	- OS met at opening	- make software for police and fire dispatching	
GW	Unisys	David Curry		GW write – "don't want to miss thi s opportunity	- GB saw Curry?	- Unisys profitable again	
GW	S.W.F.T.						
GW	Walmart					Jim McKenney knows CIO	
GW	Bank of Boston	Michael Simmons		- send prop.			
GW	GTE			???			
JO	AT&T	Susana Thompson, Jim		JOto call Zeaman		- need to strategize	
JO	Banyan	Dave Mahoney		- JO to set up talk in Oct.		- compete w/ Novell	
JO	Bellcore	George Hielmeier		- JO to call to speak at seminar		- GW to follow up w/ Davie	
JO	3M Telecom Systems	Cary Williamson @ Miller	214/233-0956	-JO invite rep. to visit -- submt prop.	- JO sent brief summary to Williamson 6/3/92	- do research on company -- via Ziffnet	
JO	Sequent	Casey Powell, Dave		- see Rdogers in Oct.	- Gwen saw at Shaeffer's conference	first get corporate	
OS	DEC	Nancy Dube	508/123-4567	shmooze Debbie--invite to open house	pitched as part of 3-year plan, send prop. v1.1 7/8/92		
OS	Wellfleet	Paul Severino	2617\123-3655	send prop.?, ask for $25K up front for planning--won't then go to Cisco	hosted w/ 5/17 brainstorming session	- after brainstorming we'll share our strategy w/ Paul	50,000
OS	IBM	Parkel, Howard Funk,		- follow up	OS sent prop v1.1 to Pollard 7/8?/92		
OS	Stratus	Foster, Bill		follow up -- Hendrie to call Foster	OS sent Foster prop 1.1 DATE?, copy to Hendrie	old history-needs to be warmed up	
OS	Proteon	Patrick Cortin (pres.)		Geri to get Salwen in for visit		Salwan friend of the Museum for a long time.	
OS	Amdahl	Gene White		send prop?	- OS toured on 7/21		
OS	Hewlett-Packard	Jim Bell		get in touch w/ Bell and ask for local advisor, Gary Eichorn	- OS met w/ Bell 7/9/92, invited to be advisor-declined- offer some one else		
OS	DARPA			OS follow up	- sent prop. v 1.2 7/23/92		
OS	Corporate Software, Inc.`	Morton Rosenthal		OS follow up	- OS met w/ Rosenthal and Rotenburg 7/16, sent prop. v1.2 7/23		
OS	Mitch Kapor	Mitch		send proposal fr. GW or OS?			

Fundraising Status for The Networked Society as of 8/31/93

Priority	Board	Company	Contact	Network Area	Next Step	Action Taken
1	OS	Adobe Systems, Inc.	John Warnock, Chair & CEO 1585 Charleston Rd. P.O. Box 7900 Mountain View, CA 94039 415-961-4400		– KC to schedule mtng. in Nov. w/ Geshke left msg. 8/27 w/Janice Colley - OS & Gordon to approach Geshke in Nov. scenario: talk about "Acrobat" and cross platform software	- OS drafted letter to Warnock
1	OS	Markey US Congress	Mark Horen		Mitch Kurtzman to invite him to lunch Mary to draft letter to Horene	
1	OS	S.W.I.F.T.	Peter Drummond, Jessica Kuborn, Shrank		-OS follow up on Shrank (here in June) call him after Aug. 18	- Greg met w/ 5/11/92
1	OS	SUN	Dorthy Torrell		- Dorothy mtng. with Bob Sproull in nxt. 2 wks (08/16-/8/31) to make decision	- OS met Dorothy 06/23 - OS spoke with Dorothy 08/13 -OS sent ltr. and corp/NSF proposals to Dc
1	OS	Wellfleet Communications	Paul Severino 123-3655		OS to call Gardner and Severino how to follow up on his letters - later...go to second tier - users - Wall Street...Beer Stearns, Goldman Sachs	OS spoke with Severino 08/11/93 - sending Sprint, AT&T, Cabletron, Chipcom, Banyan, Synoptics, CISCO; also may; make personal c PS to talk to Steve Shahel (CFO) @ Wellfleet SEVERINO $25,000 $50,000 ! WELLFLEET $25,000
2	OS	Apple	Ike Nassi		- OS to follow up 9/1/93 on e-mail sent 08/11/93 send proposal??	- Os e-mailed Ike 08/11/93
2	OS	Blue Cross	Richard Taylor		OS to call Richard Taylor mention HGHP??	-OS sent letter 8/31 saying interested in par w/focus on Health Care
2	OS	Cabletron			- follow up on Severino's ltr.? -GB to talk to Payne about contact -DG call John Burnham (603) 332-9400	- Severino to send ltr. to Craig Benson, Pres.
2	OS GH	Chipcom	David Fowler	*LAN Equipment*	-OS to call Gardner ask @ mtng. in Nov. - follow up on Severino ltr? -OS to call Rick Byrnes about this	- Severino to send ltr. to Menachem Abraham GW sent prop. v1.2 8/21/92
2	OS GH	Cisco	John Morgridge, Pres. & CEO 1525 O'Brien Drive Menlo Park, CA 94025 415-326-1941		-OS to call Gardner ask @ mtng. in Nov. - follow up on Severino's ltr. - DG to think of scenario "build your own network"	- Severino sent ltr. to Morgridge, President
2	OS	Frito-Lay/PepsiCo.	Allen Deering (Pepsico) Osborne,		-OS contact John Osborne with TNS corp proposal	- OS left message for John Osborne 08/11/9
2	OS	GTE	Bill Griffin, Walter Carlton		-OS to write ltr. to Carlton, snd corp. proposal, & Nat'l impact -follow up with call 09/01/93 -DG Call Carlton - they wanted to see Nat'l impact. – Kristan to pull together	OS sent prop. v1.2 8/14, invited to RSM ope met Carlton

Fundraising Status for The Networked Society as of 8/31/93

Priority	Board		Company	Contact	Network Area	Next Step	Action Taken
2	OS	Case	IBM	Parkel, Armstrong, Dick Case		- OS to e-mail Case @ proposal	- OS sent prop v1.1 to Pollard 7/8?/92 - OS/GW met 11/11, sent Funk prop. -OS e-mailed Case 08/11/93 - OS wrote ltr. to Sam Albert & send propos
2	OS	IS PS	MCI	Dick Liebhaber		- follow up on Severino's ltr.?	- Severino to send ltr. to Arthur Henley, VP networking Sitkin sent ltr w/ propv1.2 8/10/92 JW spoke "no $" but tryto set up mtng -Dick invited 8/27 to give Breakfast semina Sitkin, Janet to follow up
2	OS		NetFRAME Systems	Enzo Torresi, Pres. & CEO 1545 Barber Lane Milpitas, CA 95035 408-944-0600	*Network Computers*	- KC to set mtng. in Nov. - call Sept. 11 (Eileen Kennedy) - KC Ziff search – nothing!	- Gwen saw at Shaeffer's conference-will giv server
2	OS		Proteon	Patrick Cortin (pres.) Howard Salwan (chair.)		- follow up on Severino's ltr.?	- Severino to send ltr to Haward Salwen
2	OS	PS	Sprint	Ron Pounder		- follow up on Severino's ltr.? -Mckenney speak to Cash	- Severino to send ltr. to Paulo Guidi, Pres. o
2	OS		Synoptics	John Payne		- follow up on Severino ltr.? -GB to talk to Payne about contact	- Severino to send ltr. to Andy Ludwig
2	OS	McKenny	Union Pacific	McKenny's contact		Jim to talk to Union Pacific Contact	
2	OS		Unisys	David Curry James Unruh, Chair, Pres, CEO P.O. Box 500 Blue Bell, PA 19424-0001 215-986-5777 313-972-7835		-KC to call and set meeting w/ whom David Curry or Jim Unruh - develop several scenarios	- OS sent prop. v1.2 8/6/92,, Sitkin sent Johu 8/13, OS spoke Curry 12/3-"no project 'til 9
3	OS		3Com	David Abramson, Bill Swift, Eric Benhamou, Pres. & CEO 5400 Bayfront Plaza Santa Clara, CA 95052-8145 408-764-5000		- KC to arrange mtng. with Bemhimu in Nov. prob. in London (OS to send letter) - GB to talk to Payne about contact	- sent prop.v1.1 7/8/92 - OS visited Abramson in CA 7/13?/92
3	OS		Bank of Boston	Michael Simmons, Warren McFarrlen (sp? 434-6464			- McKenney spoke w/ McFarrlen
3	OS		Vice President Gore			We need to think of way to get him to opening (Carol working on this)	
4	OS		Bull	Axle LeBlois		HOLD FOR Jan. TNS Media Sponsor BILLBOARD - OS to call and update on exhibit	

Fundraising Status for The Networked Society as of 8/31/93

Priority	Board	Company	Contact	Network Area	Next Step	Action Taken
4	OS	Mitch Kapor	Mitch		not a funding source	sent proposal v1.2 8/7/92
4	OS	Sloan Found.	Hirsh Cohen			OS spoke --"not in field of activity"
4	OS	Society of Information	Pat Wallington (Xerox)		Not a funding source	- Wallington giving talk at Museum
1	GB CZ PS	AT&T	Saul Buxbaum, Victor Pelson	*Internetworking*	– Review strategy – Gwen call Carl Ledbetter	- OS sent Clark prop. 7/31, OS send Slides c Communications Sponsor at $200,000 - Severino sent ltr. 08/13/93 to Jack Cicon, data networking
1	GB	Cannon	Jon Rubenstein		GB to call Jon Rubenstein	
2	GB	AMD	Tony Rea		GB to talk to Gordon and discuss OS mtng. in Nov.	
2	GB	Arthur Anderson	Akiba Herman		GB call Akiba	
2	GB	EDS	Jeff Heller		GB to call Susan Parrish for EDS contact. to try to set up KSR pitch	
2	GB	Federal Express	Harry Dalton, VP Tech Planning		- GB to follow up on proposal sent	- GB sent proposal
2	GB	Lotus	K. C. Branscombe 617-577-8500		-Meeting scheduled for Sept. 14 at 12:00 at TCM	
2	GB	Microsoft	Rodger Heinen		-GB to e-mail Hargrove - follow up on NSF prop. -Gwen trying to meet with Karen Hargrove, meeting with Cutler/Heinen	- Kristan sent Hargrove NSF proposal 08/1
2	GB	Network General	Harry Saal	*Network Management Tools*	-GB to call Saal -GB to call Saal at Smart Valley (as recommended by Lippman)	- OS sent ltr. to Robert Lippman, Manager, N -KC sent NSF proposal to Saal - DG to follow up on OS ltr. -Saal, Lippman leaving; NG not doing well;

Fundraising Status for The Networked Society as of 8/31/93

Priority	Board	Company	Contact	Network Area	Next Step	Action Taken
2	GB	Oracle Corp.	Bruce Brown 500 Oracle Pkwy. Redwood Shores, CA 94065 415-506-7000		- Kristan to set up mtng. wk. of Sept. 26 - called, left msg. 8/30	
2	GB	Synoptics	John Payne		- follow up on Severino ltr.? -GB to talk to Payne about contact -GB e-mailed, sent proposal, e-mail again	- Severino to send ltr. to Andy Ludwig
3	GB	America On-line			-GB to look into hook via: Apple	
3	GB	Bellcore	George Hielmeier		- GB to call to speak at seminar	
4	GB	Amdahl	Gene White		???	- OS and GB mtng w/ Lloyd Didman, 11/3/ money at the moment. - OS toured on 7/21
4	GB	Cadre Technologies, Inc.	Louis J. Mazzucchelli, Jr.		- GB follow up ?????	- OS met w/ WHEN?
2	GB	Hewlett-Packard	Jim Bell, Eichhorn 3000 Hanouver Street Palo Alton, CA 94304 415-857-1501		-GB to call Chuck House see can set mtng. w/Lou Platt in Nov. -KC to call to set up meeting with Eichorn, send Corp propoal- ON HOLD	- OS sent ltr. and brief TNS description 06/ - OS met w/ Bell 7/9/92, invited to be advi: offer some one else
1	DG	BayBank	Dana Doron		-DG to call and followup	
1	DG	DEC	Nancy Dube, Bill Johnson 508-123-4567		--DG call Ed Delayney re:LanCity connection -OS to call Ed Sypeck	pitched as part of 3-year plan, send prop. v1.1 7/8/92, given Connectivity pitched at $200,000
1	DG	HCHP	Dr. Kupsc, Allen Raymond		- DG to call Dr. Kupsc to followup	- Dr. Kupsc to talk to PR Dir at HCHP, other ergonomic issues
1	DG	NEH	Tim Meagher, Fred Miller, Marsha Semmel		-Call to follow up on proposal	- DG sent proposal -Greg has spoken to sent prelim. proposals t Meagher/Miller, OS call Semmel re museum TNS project: challenge real need
1	DG	Network General	Harry Saal	*Network Management Tools*	- DG to follow up on OS ltr. - KC sent NSF proposal to Saal -Saal, Lippman leaving; NG not doing well;	- OS sent ltr. to Robert Lippman, Manager, N - KC sent NSF proposal to Saal -Saal, Lippman leaving; NG not doing well;

Fundraising Status for The Networked Society as of 8/31/93

Priority	Board	Company	Contact	Network Area	Next Step	Action Taken
1	DG	NSF	Barbara Butler, Dave Staudt, Dan VanBellenghem (CISE) 202-357-9717 dvanbell@nsf.gov		- need to develop details and other info	GW lm Staudt 2/17, spoke VBell 2/19, sen CDC -DG wrote 1st draft proposal
1	DG CZ	NYNEX	Paul O'Brien, Cas Skrzypczak, Patty Gatlin 919-644-7206		- DG write proposal -Decision Sept. 24 - need to clarify their part in TNS; send ltr to Parry and Cas	- sent proposal from CAZ to O'Brien 1/19/ -OS and DG to NYNEX, talked with Maria about next steps
1	DG	Rockwell	James Sutter, Dana Abrams, Dave Fox		- DG call Abrams 310/797-1716 re: call forwarding or networked manufacturing send NSF proposal	- OS spoke w/ Sutter— GW spoke Dana 12 spoke 1/28, pithing Fox
1	DG GH	Stratus	Bill Foster, John Goodwin		-DG come up with 3 senarios - call John and determine best one. Then OS, GH and DG will take it to Foster ($100,000) - Kristan to check into link to Networking	OS, GW met Goodwin 12/92 DG/OS met Goodwin 5/15
2	DG	Banyan Systems	Dave Mahoney, Chair & CEO Siobohan Cohen 115 Flanders Road Westboro, MA 01581 508-898-1000	*LAN Software*	-KC to schedule mtng, lft msg. 8/30 w/Susanne Platt - follow up on Severino ltr? - DG develop scenario	- Severino to send ltr. to Dave Mahoney - spoke w/ Mahoney @ breakfast, sent prop Carol handling, GW spoke Carol 3/1-sent
2	DG	K-Mart	David Carlson (friend of Irv Sitkin)		- David to call Carlson	
2	DG	Motorola	Laura Jenks		-DG to work on video phone system, then discuss funding.	
2	DG	NITA	Larry Irving		- David to find out if bill has been passed, follow up on letter sent	- David called and re-sent letter to Larry Irv 8/09/93
2	DG	US West	Robert K. Heldman		- Kristan to send letter complementing book on networks	
2	DG	Ziff-Davis	Bill Machrone, Bill Ziff		-DG to e-mail Belive	DG sent proposal
3	DG	Addison Wesley Publishing Co.	Pradeepa Siva 944-3700		-DG Follow up with someone within org - try to pitch idea of Information Sponsor	David talked to Pradeepa - will send books
3	DG	Compuserve	Tibor Vais		- Kristan to check on financial condition, no information on ziffnet – nothing!	

Fundraising Status for The Networked Society as of 8/31/93

Priority	Board	Company	Contact	Network Area	Next Step	Action Taken
3	DG	Equifax	-DG to get contact			
4	DG	Markle Foundation	Geller		Don't seem right	
4	DG	NEC	Kobayashi		need to get to Japanese office -DG call Tom Franklin re: Dick Underwood (head of NEC ops)	OS has written Unohara per suggestion of E wrote Kobayashi 9/3
5	DG	Novell	Terri Holbrooke, VP Corp Com, Martha Felt, Scott Ford		THEY ARE SPONSORS!	sent prop v1.3 12/18, met Holbrooke and F follow up, spoke Ford 1/27, D. Nelson chatt Newman 3/3, -DG call Nelson re his meetin Newman, Excecutive VP, DG sent Corp pro Holbrook; DG and OS mtng. at Museum 08/
2		Bell South	Al Jones 408-853-9450		-DG call Al Jones (first check if GW called)	
2		Northern Telecom	Roy Merrills, Pres. Paul Stern, Chair.		- DG to talk to Dan Caldwell, Corp Giving	- Sitkin spoke w/, trying to sched. visit, sent 12/18
3	JMc IS	Air Products	Pete Mather		- McKenney call - Sitkin knows Mather	
3		Consolidated Freightways				
3		CONVEX				
3		Dialog				
3		Dow-Jones				

Fundraising Status for The Networked Society as of 8/31/93

Priority	Board	Company	Contact	Network Area	Next Step	Action Taken
3		Dunn-Bradstreet				
3		Fidelity			- talk to Linda Bodman about getting contact thrugh Sam	
3		Fujitsu				
3		GAP			- Mckenney call Jiro (sp?)	
3		Hitachi				
3		Hughes	Michael Armstrong (CEO) Wayne Shleton (Div. Hd)			
3	IS	Humana	Fred Pirman (sp?)			
3		Informix	Chuck House		- meet w/ House at board meeting	
3		M/A-COM				
3		Mead				
3		MITRE	Barry Horowitz, Nelson Bollan			
3		Nippon Telephone & Telegraph				

Fundraising Status for The Networked Society as of 8/31/93

Priority	Board	Company	Contact	Network Area	Next Step	Action Taken
3		Pactel	Hancock			
3		Picturetel	Norman E. Gaut			
3		Prodigy				
3		RBOCs				
3		Reuters			- Greg contact Jon Eklund to get name at Reuters	
3		Sears				
3		Skypix	Howard M. Lefcowitz, Pres.			
3		Tandem	Jim Treybig			
3		Teleport			- McKenney call president	
3		Thomas Cooke Travel				
3		Toshiba				
3		TRW				

Fundraising Status for The Networked Society as of 8/31/93

Priority	Board	Company	Contact	Network Area	Next Step	Action Taken
3		TV Answer	Richard R. Miller, COO			
3		Verifone				
3		Walmart			get annual report	
4		American Airlines	Max Hopper, Karen Cook		GW call Cook: lm 1/28, 2/4, spoke 2/8/93--"no $"	OS spoke w/ Cook 11/30, sent Cook prop. 12/18
4		CNRI	Vint Cerf, Bob Kahn		--Not a funding source	Cerf wrote 1/25 "no $"--ISOC andorse CDC
4		DARPA	Squires, Dwayne Adams (Dep. Dir.)		-Not a lead	
4		QED	George Fosque		- Greg call and send proposal not a funder	- OS met at opening

WELLFLEET communications

DATE: April 30, 1992

TO: Distribution

FROM: Paul Severino

SUBJECT: The Computer Museum - "The Networked Society" Exhibit Brainstorming Session

In my letter dated second week of April inviting you to the Boston area meeting of The Networked Society's brainstorming session, I referred to reports that would be faxed of the first two sessions. I am pleased to send these minutes to you at this time.

If you have not responded to Carol Londres regarding your attendance on May 14th from 2 to 5 PM at the Wellfleet offices in Bedford, we would appreciate hearing from you at (617)275-2400, Extension 213.

Thank you.

Sincerely,
WELLFLEET COMMUNICATIONS, INC.

Paul J. Severino
President

Distribution:

David Mahoney - Banyon Systems
Robert Levine - Cabletron Systems
Samuel Fuller - Digital Equipment Corporation
William Griffin - GTE Laboratories
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James McKenney - The Computer Museum
Arthur Carr - Bytex
David Fowler - Chipcom Corporation
Sikhar Gosh - EDS Communications
James Dow - Microcom
Norman Gaut - Picturtel
Howard Salwen - Proteon
William Foster - Stratus Computer, Inc.
Peter Nesbeda - Xyplex

cc: Mr. Oliver Strimpell - The Computer Museum

Minutes: Brainstorming Session for the exhibit *The Networked Society*.
March 26, 1992, 8:30am-10:00am,
Xerox PARC, Palo Alto, CA.

Attending: Mark Weiser (Xerox PARC), Rich Gold (Xerox PARC) Yuval Cohen (Intel), David Redell (DEC), Sara Bly (Xerox PARC), Peter Hirshberg (Apple), David Abramson (3Com) Geoffrey Baehr (SUN), Brigham Bell, Gordon Bell, Gwen Bell (Computer Museum), Oliver Strimpel (Computer Museum), Greg Welch (Computer Museum)

Introduction

Oliver Strimpel, Executive Director of The Computer Museum, started the session by describing the goal of the exhibition. The Networked Society is intended to focus on large-scale, strategic uses of interconnected computers and the role this technology plays in our world. The exhibition need not focus on how computers work, their history, or personal, individual computer applications, as these topics are covered in other exhibits in the Museum.

Some Ways of Thinking About Networks

David Abramson launched the discussion by noting that one of the difficulties the exhibit will face is that networks *per se* are largely invisible. He proposed three broad categories that would help people think about where and how they use networks: at work, at home, and on the road. To this taxonomy was added the notion of discussing computer-mediated communication in terms of person-to-data communication (information retrieval), person-to-person communication (such as e-mail), and individual-to-community communication (bulletin boards, electronic conferences, etc.)

Qualities of Networks and Their Implications

Geoff Baehr then proposed some qualities of networks that the exhibit should seek to convey.

- that networks are invisible, but very real
- that they tend to collapse time and space
- that they are beginning to blur the distinction between home and office
- that the increasing integration of networks makes them ever more pervasive and poses regulatory dilemmas.
- distributed databases
- that soon people will never be disconnected

He noted that many of these qualities raise the issue of how our society values **personal privacy**. On the one hand, distributed databases can be used to accumulate and disseminate detailed information about an individual, and on the other hand, one will always be in touch (and may be required to be so) spells the end of the freedom from interruption and invasion of one's personal life.

He also suggested the exhibition present some brief historical perspective on the spread of networks and some metaphorical explanation of basic networking theory.

A Variety of Exhibit Ideas

The participants then offered a wide variety of ideas for concepts and displays which could be incorporated into the exhibit. This is a brief catalog of those suggestions.

- Show events/activities that could not have taken place without computer networks.

• Present the notion of *"spirited reality"* in which the environment is suffused with computers that can communicate.

• Illustrate a BAN (Body Area Network)

• Illustrate the impact networks are having and will have on entertainment--perhaps through a display of home video selection and delivery.

Giving Visitors the Experience
• Allow visitors to "ride though the network."

• Show visitors the "worlds within worlds" inside the interconnected networks.

• Install a virtual travel application (perhaps teleconferencing?)

• Illustrate the speed of the network, perhaps by sending a message to a remote location and having it reflected back?

• Portray the breadth and use of the networks by presenting a list of the thousands of news groups and bulletin boards in operation. Make it real by giving visitors the opportunity to "listen in" on one? Display "internet phone book"?

• Create a "shared drawing" interactive station where visitors could create a picture in collaboration with other remote participants (perhaps in a different museum in another city or country?). Electronic paper could scroll by slowly.

• Feature network applications such as Habitat, Electronic Café, Hole in Space, or Group W, in which visitors could participate.

• Using active badge track visitors through the exhibit and at the end give them a printout of what they saw and did and what they missed.

Commerce and Networks
• Examine how the diversity of networks impacts business decisions -- radio, Bell, cable. ???

• Illustrate far-flung and interconnected retail networks by tracing the events triggered by the purchase of a CD (something even kids can relate to) throughout the retailer's inventory network, the credit network, and the record charting network. (CD itself could also be focus of discussion of digitized information, bandwidth, etc.)

• Show how MCI handles all Visa transactions (talk to Henry Singer)

• Symbol Technologies could be resource for "point of sales" transaction display.

• Use Taco Bell as example of company micromanaged via computer network. JIT inventory control.

• Show map of what happens when making airline reservation.

• Desktalk System (LAN for airports)

Technical Topics
• illustrate different transmission media (copper, ISDN, fiber)

• show concept/importance of bandwidth by allowing visitors to adjust bandwidth of a video, or voice transmission.

• Display map of national phone network. Show how responds to failure. Allow visitors to try to bring down the network.

• Allow visitors to communicate via dry ice smoke signals.

• Show how networks are permitting distributed computing--role in scientific visualization.

Social Issues

• Illustrate where networks reach and where they don't—who has access to them and who doesn't and the implications of this.

• Examine how social priorities influence who gets what sort of access to networks.

• Introduce concept of electronic agents or "knowbots" that assist individuals in "navigating" data. -- a means for dealing with information overload.

• Show impact of breakdown in importance of time (e.g. 24-hour trading window).

• Discuss changing meaning of privacy.

• Pros and cons of affiliation marketing and direct marketing.

Lastly, all the participants felt that it was important in the exhibit to make clear the distinction between present and future applications and technologies.

Minutes: Brainstorming Session for the exhibit *The Networked Society*.
March 30, 1992, 3:30-5:30
Corporation for National Research Initiatives., Reston, VA

Attending: Vint Cerf (CNRI), Howard Funk (IBM), Patrice Lyons, Stephen Wolff (NSF), Tony Rutkowski (Sprint), Bruce Davie (Bellcore), Gwen Bell (Computer Museum), Oliver Strimpel (Computer Museum), Greg Welch (Computer Museum)

Introduction

Oliver Strimpel initiated the conversation by providing some background on the Museum and the exhibition. The core of the Museum's approach to exhibitry is the 3-minute interactive computer station. Software for such stations are developed through combining in-house efforts, donated programming time, and off-the-shelf products. The group agreed that one of the biggest challenges in planning this exhibition would be to frame a presentation that would be interesting for several years to come. The participants also noted that the exhibition should probably focus on what networks are and what they do first, in order to stimulate interest in how they work.

Vint Cerf recorded a host of topics that might be examined in the exhibition:

Technical Issues

- What is a network? Answer by example: Electronic Data Interface?, ATM, Nasdaq, on-line data system such a Compuserve, Prodigy, etc.
- How do networks grow? Internetworking.
- network scales -- office LANs, campus networks (CMU and Woods Hole (Ballard)), WANs
- Networking technologies--telephone, optical, radio
- ARPANET/Internet--MOSES program?
- speed -- super nets -- high speed gigabyte networks
- Virtual reality
- Public Networking (the phone system)
    - how do modems and faxes work (why are they disappearing?)
    - Universal numbers
- computers in the telephone net
- use of the net for computer communication
- distributed computing and the National Machine Room concept
- Database and network guides -- Archie, Prospero, GOPHER, knowbots, WAIS, virtual notebooks
- grassroots networks -- FIDO

Non-technical Issues

- copyright issues
- intellectual property rights
- liability issues associated with electronic bulletin boards and forums
- security and privacy issues linked to encryption
- Surveillance (Big Brother) and privacy--FedNet/Cross-border dataflow
- Networks as bureaucracy busters -- non-hierarchical e-mail (see Lee Sproul's work)
- Network as instrument of liberation (Relcom-- Soviet net's role in dissolution of Soviet Union -- see Ithiel de Sola Pool article in NYT) fax (China).
- Vulnerability--Implications of dependency on networks.
    - natural failures and consequences (NYC fire, Chicago flood, SF earthquake)
    - deliberate sabotage (crackers, viruses, theft of services)
    - breakdown (AT&T crash)

- What should national/international cyberspace look like? (e.g. Sterling's *Islands in the Net*)
- What competitive structures should exist within networks?
- How will networks impact the haves and have-nots?
- fluid social groups created on the fly on networks

Applications

Residential
- electronic publishing--on-line books, magazines, newspapers
- libraries and databases accessible by the net
- smart houses

Industrial
- intelligent manufacturing
- farming -- SPOT

Business/Office
- Role in banking (see Thomas Judd @ Fed Reserve in Culpepper), SWIFT, electronic fund transfer
- Electronic marketplaces-- Nasdaq, commodities
- data delivery--Knight-Ridder (training databases), Mead (Lexis, Nexis),
- video conferencing
- retail-- Gap, Mrs. Field's Cookies, Taco Bell

Research
- Medical Applications--remote diagnosis
- scientific research--SIMNET
- collaborative applications--Telnet (Minneapolis)

Education
- Education--remote teaching, EDUCOM (John Clement)

Government
- Disaster recovery networks--UNDRO, AID-VITA, -- Marty Silverstein
  - earthquake sensor networks
- traffic control
- law enforcement--FBI,

Military
- Defense--distributed war games, networked flight simulators?

History
- pre-ARPANET (smoke signals, teleprocessing, optical telegraph)
- significance of break up of Ma Bell--fax revolution, introduction of new services,
- Jim Pelkey @ Lawrence Livermore has many videos
- Ira Fuchs in ARPRANET film

Exhibit Suggestions
- make this a joint project with other science and technology centers
- link w/ schools
- get Internet Society involved -- solicit ideas over net
- ask industry about their use of networks--IBM, DEC, HP, Salomon Bros., Schlumberger, Mobil, GM, Ford

bc: G. C. HENDRIE ✓

The
Computer
Museum

300 Congress Street
Boston, MA 02210

(617) 426-2800

July 10, 1992

Mr. William Foster
President and CEO
Stratus Computer Inc
55 Fairbanks Blvd.
Marlboro, MA 01752

Dear Bill,

Three years ago, Stratus and the Museum started exploring ideas for an exhibit featuring the use of computers in banking. However, at that time, funding for The Walk-Through Computer materialized unexpectedly, and that became the focus of our development efforts.

Since our initial conversations, the Museum has developed a strategic plan for exhibits under the leadership of Gardner Hendrie. Three major exhibits focussing on computer evolution, technology, and applications have been developed as part of the plan. The fourth and most ambitious exhibit, entitled "The Networked Society" is now moving forward rapidly as our top priority. This will show the large-scale, strategic, networked uses of computers in society, a topic of even greater significance to the public now than it was four years ago.

We plan to present this topic by making the exhibit into a microcosm of society, full of opportunities for visitors to engage interactively. An exhibit description is enclosed.

As Stratus' expertise falls squarely within the domain of this exhibit, we are enthusiastic about involving you and your company in the planning, development, and sponsorship of The Networked Society. We could feature Stratus' technology in a banking application, as we originally discussed, or in a different area. We are very open to your ideas.

I look forward to working together as partners on this project and will call you in two weeks to follow up.

Sincerely,

Dr. Oliver Strimpel
Executive Director

Enclosure

The Networked Society

Living In a Wired World

Executive Summary

Computer networks span our world, transferring data at voluminous rates almost instantaneously. As we progress toward a more information-intensive society, what are the implications of this marriage between data processing and mass communications technologies? How will it transform the way we work, live, and play?

To examine these and other issues, and to enhance the public's appreciation for this technology, The Computer Museum is creating a major new exhibition entitled *The Networked Society*. This exhibition will show the strategic uses of networked computers upon which modern society depends. Examples of the applications which will be featured in the exhibition include:

- Banking
- International Markets
- Travel Reservation Networks
- Communications Networks
- Manufacturing
- Utility Management
- Retail Management

The exhibit will be a microcosm of our networked society. It will take Museum visitors right to the heart of the vital but invisible computer networks that underlie our world by means of hands-on interactive displays, mock-ups, and video. For example, visitors will be able to make reservations on a real airline reservation system, witness a simulation of a major telephone network control center, observe how point-of-sales terminals provide retailers with up-to-the-minute information on inventory, and use an ATM while observing a real-time commentary on the activity behind the scenes. As they interact with the exhibition, visitors will have the opportunity to learn how each sector relies on computers and how all the pieces are linked together. *The Networked Society* will provide visitors with an overarching vision of what networking technology means—how it has and is liable to affect our society.

Advisors from industry and academia will guide the Museum in creating an exhibition and associated educational materials that have great public appeal and educational merit. Information within the exhibit will be presented at several levels of detail to accommodate the interests and backgrounds of a diverse audience. In addition to printed materials available in the gallery, further materials will be disseminated to schoolteachers and students nationwide. On-line information will further extend the reach of the project.

The total cost of developing *The Networked Society* project will be $2,482,500, comprising the donation of $1,425,000 worth of goods and services, and $1,057,500 to offset the cash cost of developing and constructing the exhibition. The Museum is seeking visionary corporations, foundations, and individuals to sponsors this unique and innovative educational project. The exhibition will open in February 1994.

The Networked Society
Living in a Wired World

Marketing and Promotion Plans

General Plan

The promotion of ***The Networked Society: Living in a Wired World*** will be a multi-tiered program. In conjunction with the pro bono efforts of one of New England's top advertising agencies, *Leonard Monahan Lubars & Kelly*, The Computer Museum will develop a professional print and broadcast campaign for newspapers and magazines, TV and radio, and billboards. *LML&K* will be involved in both the creation of promotional materials and the implementation of the campaign. As it has done successfully n the past, the Museum will engage in cooperative promotional and marketing efforts with area hotels, tourist attractions, and convention facilities. Collateral materials and a retail merchandising program will also be developed. All efforts will be targeted to both trade and consumer market segments.

Sponsor Recognition

In addition to credits appearing in press releases, exhibit panels, posters, opening invitations, and other printed and electronic materials, sponsors of $25,000 or more will be included in a special series of promotional advertisements to be placed in industry and business publications prior to and following *The Networked Society's* opening in February 1994. The Museum will request full-page, four-color advertisements in leading industry, business and news publications to promote the new exhibition. The Museum has successfully solicited over $500,000 a year in free advertisements from over twenty publications, including:

- *Business Week*
- *Fortune*
- *Byte Magazine*
- *Computerworld*
- *MacWeek*
- *PC World*

The Museum's new galleries and exhibitions receive extensive international media coverage. For example, promotion of the Museum's landmark exhibition, *The Walk-Through Computer™*, made over 300 million media impressions worldwide. As an exhibition treating a topic of great public interest and vital economic importance, *The Networked Society* is expected to result in exceptional worldwide electronic and print coverage. This will provide unusual visibility for the exhibition's sponsors and, in turn, attract large numbers of visitors to the exhibition.

The Networked Society
Living in a Wired World

Sponsorship Opportunities

The Networked Society: Living in a Wired World provides a unique opportunity for corporate and individual sponsors to be associated with a highly visible exhibition about what people can do with their personal computer. Not only will sponsors be part of a unique and important public education project, they will help people from all walks of life discover new and creative ways in which to take advantage of computer technology. Benefits and privileges are designed to ensure that all sponsors and donors receive appropriate levels of recognition.

Principal Sponsors ($250,000 and up)
Principal Sponsors will receive prominent acknowledgement in all published materials and communications regarding the exhibit including the ad campaign (see "Marketing and Promotion Plans"), press releases, posters, gallery leaflets, and educational materials for school groups. Sponsors in this category will lead the list of supporters on credit panels placed prominently in the exhibition and will be granted rent-free use of the entire Museum for a function, an open house with 50% discount on admission to all employees and their family members with discounts in the Museum Store, and 100 tickets to the exhibit opening.

Major Sponsors ($100,000 to $249,000)
Prominent acknowledgement in all published materials and communications regarding the exhibit, including the ad campaign. Sponsors in this category will follow Principal Sponsors on the list of supporters on credit panels placed prominently in the exhibition and will be granted rent-free use of the entire Museum for a function, an open house with 25% discount on admission to all employees and their family members with discounts in the Museum Store, and 50 tickets to the exhibit opening.

Sponsor ($50,000 to $99,000)
These sponsors will be acknowledged in exhibit publications and advertisements, but not in all press releases; their names will follow those of the Major Sponsors on the gallery credit panels. These sponsors will be entitled to an open house with 25% discount on admission and Museum Store discounts for all employees and their family members, and 15 tickets to the exhibit opening.

Donor ($25,000 to $49,000)
These sponsors will be acknowledged in publications and advertisements associated with the exhibit, but not in all press releases, and their names will follow those of the Sponsors on the gallery credit panels. Donors will receive 10 tickets to the exhibit opening.

Contributor ($10,000 to $24,000)
These sponsors will be acknowledged in exhibition advertisements, and on the sponsor panel in the exhibition itself. Contributors will receive 5 tickets to the opening.

In-kind Support
Supporters providing in-kind donations of equipment or services will be acknowledged on a separate credit panel displayed in the exhibition gallery, in accordance with the significance of the contribution.

The Networked Society

Living in a Wired World

A Major New Exhibition
Proposed by
The Computer Museum

The Computer Museum 300 Congress Street, Boston, MA 02210 617.426.2800 FAX 617.426.2943

Contents

Introduction

We live in a wired world. Computerized networks span the globe. Transferring vast quantities of data almost instantaneously, these networks form the bedrock upon which the daily activities of our modern society depend. Yet, to most people, this foundation is invisible, a silent machine that tirelessly attends to the things we take for granted: commerce, communications, transportation, and utilities. However, as computer networks continue to spread, affecting the way we work, play, and interact, they will change the foundations of our economic life and social institutions. We all need an understanding of this vital technology and how it is shaping and will affect our world and our lives.

To promote public understanding of networking technology, and its use, potential, and social implications, The Computer Museum is creating a unique new exhibition: *The Networked Society: Living In a Wired World.* This 5,000 square-foot, $2-million exhibition will open in February 1994 and provide visitors with compelling experiences of and unique insights into the largely invisible world of large-scale networks. Through a series of vignettes that recreate banks, classrooms, travel agents, fast food joints, and other familiar settings, *The Networked Society* will reveal to the general public the complex web of communications, data, and control networks that surround them in their daily lives. Interactive "games" and simulations will help visitors appreciate the technology and grasp the personal and societal issues raised by its use.

Rationale and Goals

Since the economic and strategic significance of this technology is increasing dramatically, a basic familiarity with its function, use, and impact is becoming an essential component of the "technological literacy" necessary to cope with, participate in, and contribute to modern society and its change and growth. The goal of the exhibition is to give the public a better understanding of the critical role of networks in our world.

The exhibition will have achieved this goal if it increases people's awareness of and ability to use the networks that surround them and that they use every day, often without even knowing it. With this knowledge people will better understand :

- the capabilities and future potential of information networks

- causal relationships in our networked society

- how to make more informed choices about their own activities

- how to make more informed contributions to the process by which the shape, character, and function of the networked society is determined

The exhibition seeks to heighten people's awareness of the computer networks around them, and provoke them to think about and question the broader personal and social implications of the technology.

Audience

The key to the success of this exhibition will be its ability to inspire and inform people of all ages and backgrounds, particularly those with little or no previous technical experience. Intuitive, interactive computer-based displays, a hallmark of The Computer Museum, will be the focus of the visitor experience. Thorough prototyping and testing will ensure that these presentations provide an engaging and informative experience for visitors ranging from grade-school students to graduate students, from "techno-phobes" to computer professionals. Multilingual components will broaden the exhibition's appeal to the many foreign visitors to the Museum (some 12% of the Museum annual audience). Educational materials will help teachers make the most of their class visits (45% of visitors are students). Outreach materials will extend the reach of the exhibition beyond the core audience of visitors to the Museum.

Impact

One million visitors will use the exhibition during its life at the Museum. Each year an additional one million are expected to interact with elements of the exhibit at remote sites through distribution of exhibit components to other museums or via on-line interactive activities networked to the exhibition.

No less important will be the influence on other science and technology centers and the media. As the world's only museum exclusively dedicated to presenting and interpreting computers and their impact, The Computer Museum is a model for many other museums and science centers planning exhibitions on computer technology, and it disseminates elements of its exhibits worldwide. Likewise, as with all the Museum's innovative exhibitions, *The Networked Society* will inspire print articles and electronic media coverage and serve as a resource for journalists from around the world.

Through all these channels, direct and indirect, the exhibition will help expand the understanding of networks among millions of people.

The Exhibition: Making Connections

From direct mail to credit checks, renewing a driver's licence to borrowing a book from the library, chances are a computer records the information, and sends it to other computers for processing. Anyone who has ordered airline tickets, withdrawn money from an automatic teller machine, filed an insurance claim, used a credit card, made a phone call, or paid an electric bill has had information about them processed by a computer. It is estimated that the name of every adult in the United States is processed 33 times a day by computer. A multitude of corporate, government, and institutional computer networks work 24 hours a day, processing and transferring information about us at lightning speeds.

Despite their pervasiveness, the very nature of networks makes them difficult to grasp:

- networks defy the bounds of human scale, interconnecting until they embrace the globe

- they defy geography and time, forming links that recognize no national or natural borders

Regardless of media, the essence of networks is intangible data. To help people "see" this invisible world, the exhibition must start with the familiar and move toward the "big picture." In essence, the exhibit will be a microcosm in which visitors grasp the connections that networks form between the local and familiar and the distant and invisible.

The entrance of *The Networked Society* will be ringed by computer stations. The stations are visibly linked to a stylized depiction of a vast data network that embraces the entrance area and spreads into the exhibition. "Start here" the stations say. When visitors sit at a station the screen responds: "Welcome to The Networked Society. Please enter your name." The computer asks the visitor to answer a series of questions and then issues them an "activecard."[1] Lights representing the data from the visitors' response flow through the "network" in the entrance area and into the microcosm of the exhibit.

Though the visitors may not realize it yet, this activecard will allow the computers throughout the exhibit to recognize them, track their movements, and accumulate information about them during their visit. The entire exhibition will be networked, and visitors will come to understand many of the properties of our networked society through first-hand experience in this concentrated environment. At the end of exhibition, a computer station will reveal what it knows about the visitor's visit, and the simulated events triggered by their activities. In effect, the exhibition will chronicle "a day in the life" of the networked society.

The Microcosm: The Backbone of the Exhibition

As visitors leave the entrance area, activecard in hand, they come upon an area that stretches before them like a "World according to. . ." poster: in the foreground are displays depicting a local town, past them are areas and institutions on a regional scale, and in the distance the scope is continental. The foreground of this area is a town, with a bank, a clothing store, a supermarket, a house, a travel agent, traffic lights, pay phones—businesses and environments with which we interact every day. In the middle distance, the institutions represented take on a larger scale: hospitals, factories, corporate office buildings, an airport, a university campus, a power plant. At the opposite end of the area, maps representing whole countries spread out before the visitor's eyes. A web of lights depicts the information flowing across and between communities, countries, and continents. A satellite spins overhead.

The physical construction of this space mirrors the interconnection of local area networks into wide area networks, which connect into regional networks, which, in turn, interconnect via continental and global networks. The notion of interconnection between domains of varying scales is critical to visitors' understanding of the Networked Society. This area forms the backbone of the exhibit. Visitors will be able to wander off into the various settings and explore a host of interactive displays explaining how computer networks serve society in different contexts on different scales.

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[1]This will be some suitable technology for recording information and tracking the visitor's movements. Ideally, it would also be a souvenir.

Visitors might choose to enter the fast food restaurant where they can walk behind the counter, to see how behind-the-scenes the activities of the staff, from submitting to filling orders, is coordinated by a computer network. Visitors can then observe how this network links to the chain's other franchises and regional headquarters. At a terminal that taps them into the chain's network, visitors order 300 hamburgers, watching the complex chain of events this triggers: inventory is updated, orders for replenishing the stock are issued, shipping orders issued, etc. Through this activity, the visitor experiences how everyday local actions initiate reactions throughout the country that ultimately echo back to the local level, in this case, by the delivery of fresh hamburgers.

Throughout the exhibit, visitors penetrate "behind the scenes," experimenting with and experiencing the networks that underlie the operations they take for granted.

• Visitors can descend a manhole to explore the many different networks laced beneath our streets. A special viewing port will allow them to watch a depiction of information flowing along a fiberoptic cable: there goes a credit card check to a computer in Kansas, a news report coming in from Switzerland, an x-ray being sent to Boston.

• Visitors will experiment with the network that controls traffic lights throughout a city. Can they use it to avoid gridlock during rush hour?

• They will oversee the operation of an "intelligent factory," discovering not only how a computer network orchestrates the complex processes on a factory floor, but also allows mass production techniques to build customized items in response to order placed from all over the country. They can control a mechanized model to produce a souvenir to their specifications.

• In a university setting, visitors can exchange ideas on a computer network and discover the critical role such networks play in scientific and other academic research. This will be the ideal place to introduce visitors to the Internet.

• At the airport, visitors will ascend the control tower. Tapping into the FAA's network, they will observe the waves of planes which depart the major national hubs every hour.

• When they explore beyond the familiar face of an ATM, visitors will discover what actually takes place when they make a deposit (using their active cards). Pursuing the trail of their transaction they'll see it merge with thousands of others at their bank, then transactions from hundreds of other banks, and ultimately become swept up in the tidal wave of capital which daily circulates through the global capital markets.

• In a visit to the hospital (as an observer), the visitor will experience how computer networks assist in the management of vast amounts of diverse data. Every patient generates a 30" stack of paperwork, from records of symptoms, diagnosis, and treatment, to forms for billing and insurance.

• Sitting down in a police cruiser they will discover the role of networks in law enforcement.

• At a phone booth, visitors will find a display that lets them travel down the telephone line to watch how computers direct the flow of telephone traffic across the country.

• A model home will be an opportunity to explore some of the applications of networks on the horizon: fiberoptic delivery of information, services, and entertainment, "smart houses," and more widespread telecommuting.

Each environment will be interactive, allowing visitors to go beyond mere observation to experience and experiment with the technology. Where appropriate, the interactive experiences will allow visitors to cope with or observe unusual events or "crisis." For example, in the case of the air traffic control scenario, visitors will observe the effect of and react to Chicago's O'Hare Airport getting snowed in. In this way, they will come to understand the critical role of networks in maintaining the function of our society's infrastructure.

The critical aspect of these "case studies" is that they start on ground familiar to people, and step by step lead them to discover the vast "hidden" computer infrastructure behind their world. The exhibition will help people understand the importance to the Networked Society of interaction between people, between people and machines, and between machines.

Technical Topics

The exhibition will also allow visitors to familiarize themselves with some of the technical principles of networks. For example, to get across the notion of bandwidth and why it is important, while they are visiting the house-of-the-future setting, visitors will experiment with the bandwidth of the cable entering the TV; constraining the flow of data visibly affects the quality of the picture. Visitors will also be able to try the same experiment on an audio telephone line. By comparing the suitable bandwidth for each, visitors will recognize that video images require greater bandwidth than audio, which in turn requires more than alphanumeric transmission.

Other technical topics that will be covered within the exhibition include:

- how information is packaged in a network (headers, tails, packets, etc.)
- an explanation of protocols, addressing, routing, etc.
- a description of the OSI seven layer model
- how signals are modulated in fiberoptic cables
- the variety of LAN architectures
- how intercontinental transmission of data occurs.
- comparisons of different networking media (copper, fiber, wireless)

Other themes of a technical nature the exhibition will present include:

- the rapidly increasing complexity of systems and customizing of services
- the potential for choice offered by networks (over the force-fed nature of current broadcast)
- the speed of networks (demonstrated by showing the transaction time between NYC and London)
- the shrinking cost curve of communication

Social Themes

As networks transform our world they are testing the limits of our social and political institutions. Therefore, in addition to presenting the applications and technical functioning of networks, *The Networked Society* will address the social impact of this vital technology. A team of anthropologists, sociologists, philosophers, and legal scholars will work with Museum staff to craft thought-provoking displays that provide visitors with insights into the following issues:

- the ethical dilemmas involved in implementing computer networks:
  - is personal privacy the price of market efficiency?
  - are restrictions of individual freedoms the price of a secure society?
  - are increasing complexity and risk the price of a more sophisticated infrastructure?

- What are the sociological repercussions of computer networks in the workplace and home? On the one hand, computer networks as tools for collaboration may draw people closer together. Research has documented how they flatten traditionally hierarchical organizations and free communication of ordinary social stigmas. However, as tools for surveillance and monitoring they can also drive wedges between and demean people.

- Networks are means of interpersonal communication that defy traditional boundaries of time, space, and social mores, and foster the creation of an electronic persona that exists solely in the electronic "net." This allows people alienated by traditional society to seek out others like them, to realize they are not alone. Similarly, those otherwise bound by infirmity can expand the scope of their social interaction using networks. What impact does this have upon the psychological perception of self and surroundings?

- What are the anthropological dimensions of computer networks? McLuhan's conception of the global village is truly emerging within computer networks. Closely knit communities defined not by proximity, but by other commonalities, evolve within global computer networks in a trend that has been called "electronic tribalism."

- What strains are networks placing upon our legal institutions? The new medium of computer networks raises questions in such areas as intellectual property rights, liability, personal privacy, and the freedom of speech and press. Above and beyond these debates, global computer networks pose a variety of jurisdictional dilemmas.

These issues are abstract and not always readily apparent to members of the general public, particularly those who do not routinely and directly use computer networks. Thus, the challenge posed to the advisory committee and Museum staff will not only be to define these issues, but also to develop methods for communicating them to the public through the experiential environment of an exhibition. Once visitors have had this experience, the exhibition can then help them reflect upon what *they think* about the issue at hand and guide them in understanding how they can help shape the way the technology will affect their lives.

Other Project Elements

Remote Sites

The exhibition will seek to expose the public to the very essence of networks by connecting stations within the Museum to remote sites. These sites may include museums in other countries, schools, or even shopping malls. The intention is two-fold: 1) to give visitors to the Museum a sense of what it is like to communicate via a network, and 2) to extend the reach and impact of the exhibition beyond the walls of the Museum. The Museum may also set up public on-line bulletin boards and other on-line interactive experiences that individuals or groups, such as classes of students, may access from their personal computers.

Educational Materials and Activities

The exhibition's impact will also be extended by packets of educational materials. These written materials will be sent to teachers prior to their class visits and will contain suggestions for activities and discussions, a guide to the exhibition, and other information designed to help students get the most from the exhibition.

As with educational materials developed for other Computer Museum exhibitions, these materials will also be available to and useful for teachers nationwide as a supplement to their computer curricula. The Museum's standing committee of educational advisors will participate in the design of the materials so that they stand on their own and do not rely upon a visit to the exhibition. The Museum hopes to have these materials available on-line, so that teachers and classes may easily access them and engage in on-line participatory activities.

Project Plan

The Museum intends to open *The Networked Society* in February, 1994. The project team will complete conceptual planning by the end of 1992 and test and refine the ideas for the exhibition during the first quarter of 1993. Implementation of the exhibition will occupy the remainder of the project period.

Work To-date

During March and May 1992, the project team organized a series of three brainstorming sessions in the San Francisco, Washington D.C., and Boston areas. Representatives of both the computer and communications networking industries attended these sessions (refer to the Industry Advisors section to see a list of the participants) and offered their perspectives on the technical and social issues the exhibition should present. Many of the ideas presented in this proposal resulted from these discussions.

Planning Phase

The project team will continue to hold periodic brainstorming sessions throughout 1992 and 1993 to seek input and feedback from its industry advisors. In addition, staring in the fall of 1992, Museum staff will hold meetings with academic advisors to elaborate the social themes in the exhibition (see next section for the list of academic advisors). During this period the staff will develop concrete pre-

sentation ideas and prototypes of exhibit elements, which they will evaluate during the first quarter of 1993. The student advisory team (see Project Participants) will play an instrumental role during the evaluation process.

Implementation Phase

Having evaluated and refined the exhibition concepts, interactive components and educational materials, Museum staff will make a final presentation of the exhibit plans to the advisors in April, 1993. Once these plans have been approved the Museum staff will retain a contractor for fabrication of the exhibition, hire programmers, and begin the implementation of the exhibition, with an opening date in February 1994.

Refinement and Operational Phase

The final phase of the project will take place after the exhibition has opened to the public. Concerted marketing and public relations campaigns will help ensure wide attendance. Extensive evaluation of the exhibition will identify areas in need of improvement. Sufficient funds will be held in reserve to allow for refinements and improvements found to be necessary in the light of operational experience.

Project Team

Museum Staff

The following Museum staff will be involved in the project. Additional personnel will hired as required.

Dr. Oliver Strimpel (D. Phil., Oxford University) is the Museum's Executive Director. Formerly with the Science Museum in London, Dr. Strimpel has created numerous exhibits related to computers, including *The Walk-Through Computer™*, *The Computer and the Image* and *Smart Machines*, at The Computer Museum. He will lead the project.

Gregory Welch, Director of Exhibits, (A.B., History of Science, Harvard University) is the creator of several exhibits at the Museum, including *People and Computers: Milestones of a Revolution*. He has consulted for Time-Life Books and the United States Information Agency in connection with computing history and technical exhibition projects and has studied the science and technology museums of Europe as a Shaw Fellow. He will oversee all aspects of the project's development.

David Greschler, Exhibit Developer, (A.B., Brandeis University) was part of the team that developed the Museum's *Walk-Through Computer*, and headed the development of *Tools and Toys: The Amazing Personal Computer*. He has worked at the MIT Media Laboratory, has taught educational software design at the Harvard Graduate School of Education, and is a recipient of the Thomas J. Watson Fellowship. He will be responsible for the design, evaluation, and development of interactive components for the exhibition.

Dr. Gwen Bell, the Museum's Founding President and Director of Collections (Ph.D., Clark University), has guided development efforts for many of the Museum's exhibits. She is currently serving as President of the Association for Computing Machinery and will play an active role in guiding the project through the planning and implementation phases.

Natalie Rusk (Ed. M., Harvard University, A.B., Brown University) is the Museum's Director of Education. She has created educational program and materials for the Museum's permanent exhibitions, including the video, *How Computers Work: A Journey Through the Walk-Through Computer*. She will be responsible for designing and producing educational materials and programs associated with *The Networked Society*.

Ted Groves, Graphic/Exhibit Designer, is a graduate of the University of Illinois and former employee of the firm, MGIA Architects, Inc. Several of his graphic designs for the Museum have won national awards, including *Print Magazine's* Design Excellence Award and the American Association of Museums's Award of Distinction. He was the sole designer responsible for the *Tools and Toys* exhibition, and will be responsible for creating and implementing the three-dimensional and graphic design schemes for *The Networked Society* and any associated publications or other print materials.

Susan Dahling (M.B.A., Amos Tuck School of Business, Dartmouth College, A.B., Mount Holyoke College) is the Museum's Director of Marketing. She has had over ten years of marketing experience in both the public and private sectors, and has helped the *Tools and Toys* exhibit boost Museum attendance 16% over the previous year. She will be responsible for all promotional and marketing activities surrounding the exhibit.

Gail Jennes, (A.B. Wellesley College) Senior Public Relations Manager, and former bureau chief for *People* magazine, has promoted all the Museum' major projects over the past five years. Her efforts in connection with *The Walk-Through Computer* resulted in over 300 million media impression world-wide. She will implement the Museum's publicity campaign for the exhibit.

Advisors

The Museum has assembled three distinct teams of advisors to help develop an effective, well-balanced exhibition.

Industry Advisors

To provide input on the technical topics the exhibition should cover and help formulate appropriate case studies, the Museum has assembled a team of advisors representing the networking industry and community. They include:

David Abramson, 3Com Corporation
Geoffrey Baehr, Director of Advanced Development, SUN Microsystems
Gordon Bell
Sara Bly, Work Practice and Technology Systems Laboratory, Xerox PARC
Vint Cerf, Corporation for National Research Initiatives
Yuval Cohen, Intel
Bruce Davie, Bellcore
David Fowler, Chipcom
Howard Funk, IBM
Rich Gold, Xerox PARC
Bill Haynes, GTE
Peter Hirshberg, Apple Computer, Inc.
Patrice Lyons, Attorney
Jim McKenney, Harvard Business School

David Redell, Systems Research Center, Digital Equipment Corporation
Tony Rutkowski, Sprint
Howard Salwen, President, Proteon
Paul Severino, President, Wellfleet Communication
Mark Weiser, Principal Scientist, Manager, Computer Science Laboratory, Xerox PARC
Stephen Wolff, Directorate of Computer and Information Sciences, National Science Foundation

Academic Advisors

To provide assistance developing the themes related to the social impact of networks the Museum has solicited the participation in the project of the following scholars:

Dr. Robert J. Baum, Philosophy, University of Florida
Dr. Paul Edwards, Science and Technology Studies, Cornell University
Dr. Diana Forsyth, Anthropology, University of Pittsburgh
Dr. Tom Hughes, History of Science, University of Pennsylvania
Dr. Rob Kling, Philosophy, University of California at Irvine
Dr. Gary Marx, Sociology, Massachusetts Institute of Technology
Dr. Lee Sproull, Sociology, Boston University School of Management
Dr. Alan Westin, Political Science, Columbia University
Dr. Shoshana Zuboff, Harvard Business School

Student Advisors

To ensure that the exhibition is an enriching experience for youth, the Museum staff will work closely with a class from the Martin Luther King Jr. School, an inner city middle school in Boston. These students will critique the plans, text, and interactive stations for the exhibition. Previous exhibitions have shown this approach to be an empowering experience for the students and to provide valuable input for the staff.

The Computer Museum

Background

The Computer Museum was incorporated in 1982 as a public non-profit institution dedicated to educating the public about computers and preserving computer history. It possesses the world's most comprehensive collection of historic computers, robots, computer ephemera and related artifacts, as well as extensive film, video, and photo archives related to computing and its history. Drawing upon these collections, The Computer Museum develops exhibits which help the general public understand not merely how computers work and what they can do, but also the social context and impact of computer technology.

Exhibitions

The Museum's 25,000 square feet of exhibits range from reconstructions of early computer installations to state-of-the-art displays on computer graphics (*The Computer and the Image*), and artificial intelligence, robotics (*Smart Machines*).

In 1988, the Museum adopted a plan to develop four major new exhibitions to demonstrate how computers work, where they have come from, and how they are used. The Museum completed the first phase of this plan with the opening in June 1990 of *The Walk-Through Computer*, a 2-story

Project Budget

The total cost of developing *The Networked Society* will be $2,482,500. This will cover the staff costs, research, planning, concept development and evaluation, fabrication, computer programming, equipment, and marketing of the exhibition. Over half this budget will be acquired in the form of donations of goods and services, such as computer equipment, maintenance contracts, pro bono professional services, and free ad placements. The Museum has had extensive experience drawing upon volunteers to help meet these needs. The cash cost of the project reflects the actual cost to the Museum of those expenses which cannot be procured through donations, such as personnel costs, construction materials, and fabrication contracts.

Project Element	Cash	In-Kind
Personnel	265,000	
Travel	7,500	
Programming	100,000	500,000
Consultants	10,000	
Equipment	100,000	800,000
Construction	250,000	
Graphic Production	75,000	20,000
Video Production	150,000	30,000
Educational Materials	25,000	
Promotion	75,000	75,000
Project Total	**$1,057,500**	**$1,425,000**

model of a personal computer explaining how computers work. Sponsors of the exhibition included: the Alfred P. Sloan Foundation, the Kapor Family Foundation, Digital Equipment Corporation, Apple Computer, AT&T, and Intel Corporation.

The following June, the Museum opened *People and Computers: Milestones of a Revolution.* Representing the second phase of the exhibits plan, this historical exhibition was made possible by sponsorship from the National Endowment for the Humanities, Digital Equipment Corporation, IBM Corporation, Apple Computer, Lotus Development Corporation, Matsushita Electrical Industrial Company, the MITRE Corporation, The Travelers Companies, and Unisys Corporation.

To focus upon the diverse stand-alone uses of personal computers, in June 1992, the Museum opened *Tools and Toys: The Amazing Personal Computer*. Developed in conjunction with The Boston Computer Society, this dynamic hands-on exhibit appealing to "children of all ages" was underwritten by William H. Gates III, The Kapor Family Foundation, Steve Wozniak, Apple, Digital Equipment Corporation, Cabot Corporation Foundation, Raytheon Corporation, and 3Com Corporation.

The Networked Society, focussing on the large-scale, strategic uses of networks will be the grand finale of this exhibition plan.

Educational Programs

The Museum's Educational programs comprise gallery tours, family computer workshops, multilingual activities packets, and educational videos.

All class visits receive guided tours of the exhibitions. In addition, Visitor Assistants conduct tours periodically every day for all interested visitors. The Museum's Educational Activities Packet is sent to all classes prior to their scheduled visits, and to educators across the country and internationally (e.g.: Canada, Mexico, Japan, and Nepal) as a supplement to their computer curricula. Under a grant from the NYNEX Corporation, this Packet has been translated into Spanish. On selected weekends throughout the year, the Museum staff conducts family computer workshops, such as "Build Your Own Robot." The Museum has produced an educational video, "How Computers Work: A Journey Through the Walk-Through Computer," which is distributed nationwide to parents and educators for use at home and school.

The Museum is currently developing an innovative learning center called The Computer Clubhouse. Designed to provide underserved youth with access to computer technology, the program will also result in software and extended educational activities for use in school computer labs, afterschool centers, and other educational environments.

The Networked Society

An exhibit on the applications, technology, and impact of the Global Information Infrastructure

The Computer Museum, Boston, USA

The Networked Society

An exhibit at The Computer Museum on the applications, technology, and impact of the Global Information Infrastructure

Computer networks are everywhere.

They are part of how we communicate, collaborate, monitor, strategize, and share all kinds of information. They control the utilities in our buildings, oversee the traffic we fight on our way to work, and are the backbone of our financial transactions. They record everything, from our stays at hospitals to purchases at the corner store.

And this is just the beginning. Strategic alliances are now being struck between unlikely partners that will break down traditional distinctions among television, telephones, and computers, changing the way we get our news, do our shopping, interact with others, and enjoy entertainment. One day soon, we all may be linked by a grand "information superhighway" network, a stream of data, voice, video, and three-dimensional images reaching into our homes, workplaces, and any point in between.

This growing *Global Information Infrastructure* is everywhere, and it touches everyone. Yet, because computer networks are, for the most part, *invisible,* most people do not know about them, do not know how they work, and do not realize how much they influence their lives.

To make this invisible infrastructure *visible,* The Computer Museum is creating *The Networked Society,* a major new 5,000-square-foot, $1.5-million exhibit, opening in November 1994.

The Global Information Infrastructure is one of the central developments of this decade, and it is essential that people be made aware of ways in which it will touch their lives. *The Networked Society* exhibit will play a significant role in promoting public understanding of this topic – revealing the different uses of the growing infrastructure, demystifying the technology, and uncovering how it is changing our view of ourselves.

To make the invisible visible.

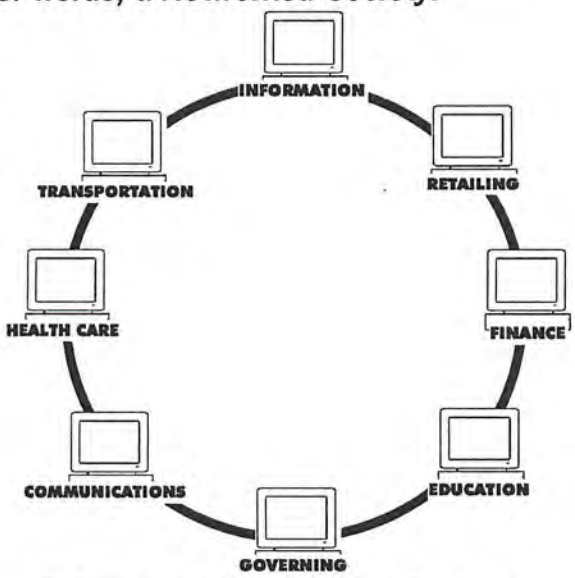
The Networked Society exhibit will reveal the Global Information Infrastructure by:

- Providing experiences with a variety of computer networks applications.
- Explaining the technology of computer networks.
- Raising questions about the social and ethical impact of computer networks.

To accomplish these goals, the exhibit will be designed as a representation of the Global Information Infrastructure – in other words, a *Networked Society.*

Divided into eight different application areas but linked together with an actual network, the exhibit will consist of vivid interactive environments highlighting different uses of computer networks.

Each area will consist of a series of interactive stations where visitors actively learn about the applications, technology, and impact of networking.



The Visitor Experience

From the beginning, the visitor experience will be a mix of reality and fantasy, where real information and actual networking technology will be combined with hands-on activities that will highlight the Networked Society.

Logging In

Visitors start the exhibit by logging into the infrastructure. Typing their first name into a computer, they choose a pseudo-identity – age, sex, job, income, history – that is issued on a smart card. They carry this card throughout the exhibit and use it within the different application areas.

Application Areas

Card in hand, visitors enter the *Networked Society* via one of eight application areas. *For example: The communications application area will be set up as a telephone control center. Visitors will be surrounded by large projections of telephone traffic around the world.*

Interaction with Networks

This vivid setting will be the starting point for further discovery. Inserting their smart card into state-of-the-art computer stations, they will face real-world scenarios that, based on their pseudo-identity, will further involve them in the application area being highlighted. *For example: In the communications*

application area visitors may encounter a scenario where all of a sudden great demand is placed on phone circuits in a certain part of the country. Just as people do in real communications control centers, visitors will respond to this problem by using a network to re-route calls through circuits that have less demand.

Interaction with Visitors

Visitors will also use networks to communicate with other visitors in the exhibit, and jointly solve problems they face within the scenarios. *For example: In interactive stations highlighting the use of LANs and WANs, several visitors will be part of a scenario in which they will be "located" in different parts of the world. Using the network that links them together, they will jointly develop a memo resolving a crisis situation, while watching how the information they generate and receive is routed through the network.*

To bring visitors even closer together, the exhibit will employ the latest videophone technology to connect visitors with people at different off-site locations around the world, including other museums, shopping areas, and city halls. Using a system now being tested by the Museum, visitors will interact with these off-site visitors using video images and drawing tools to partake a joint activity, such as drawing a picture of what they think the computer of the future will look like.

Social and Ethical Issues

The exhibit will also demonstrate the impact this technology will have on the way we work, play, interact with others, and think about ourselves, highlighting issues such as telecommuting, privacy, and the changing nature of communication. Visitors will face these social and ethical issues and make choices about the rights and responsibilities of being part of a Networked Society. *For example: The smart card that visitors will use to interact throughout the exhibit will provide an excellent lesson about privacy. At the end of the exhibit, when visitors log in for the last time, they will get a detailed review of all their interactions within the Networked Society. This experience will provide them with a helpful review of the exhibit, as well as cause them to consider both the advantages and implications of the powerful organizational and centralizing qualities of a Networked Society.*

The Technology of Networks

Each application area will also give visitors an understanding of the technology involved in networking. Indeed, since the exhibit itself is a network, there will be many ideal opportunities to demonstrate the hardware and software running the system. Topics such as protocols and routing, headers and packets, and comparisons of different networking media all will be highlighted as part of the interactive experience. *For example: To learn the concept of bandwidth and why it is important, visitors in the information application area will experiment with the bandwidth of the cable entering a TV. As they constrain the flow of data, they will discover how the quality of the picture changes.*

Audience Reach

The Computer Museum has a broad audience, with a significant mix of visitors ranging from grade-school to graduate students, and from "techno-phobes" to computer industry managers and decision-makers. *The Networked Society* will be a permanent exhibit; it is expected to attract one million visitors during its life at the Museum.

An additional one million people will be reached each year through outreach programs, including:

- *Educational Activity Packets:* bilingual educational materials about the Museum's exhibits disseminated to teachers nationwide as a supplement to their curricula.
- *Exhibit Kits:* software packages of the Museum's most popular interactive stations. Over thirty Exhibit Kits have been placed in Museums around the world.
- *Exhibit Videos:* education presentations based on exhibits distributed to educators and individuals. Over 10,000 copies of the Museum's video *How Computers Work: A Journey Into the Walk-Through Computer*™ have been sold nationwide.

Marketing and Promotion

The Museum plans a major marketing and promotion campaign for *The Networked Society*, including a print and broadcast campaign for newspapers, magazines, TV, radio, and billboards. The Museum will work with its sponsors to create joint promotional programs, including special events, press releases, PSAs, advertising, and other collaterals. Cooperative promotional, advertising, and marketing efforts will be developed with area ad and PR agencies, hotels, tourist attractions, and convention facilities.

All efforts will be targeted to both trade and consumer market segments on a national and international level. Since 1988 PR efforts for the Museum have resulted in over 828 million media impressions in 63 countries.

Building The Networked Society

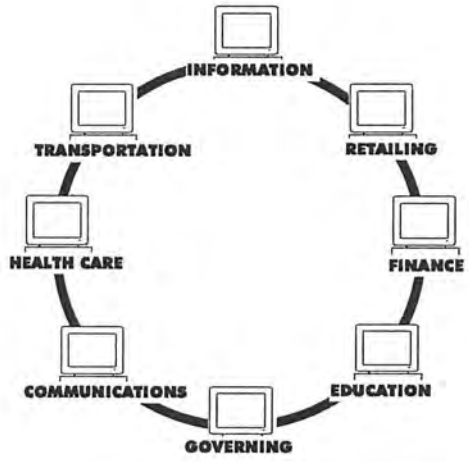
In the last three years, The Computer Museum has opened three $1-million exhibits: *The Walk-Through Computer*™ (how computers work), *People and Computers: Milestones of a Revolution* (computer history), *and Tools & Toys: The Amazing Personal Computer* (computer applications). Each was developed in approximately 18 months. *The Networked Society* exhibit will follow a similar model, with most design (three-dimensional and interactive components) completed in-house with the help of in-kind technical advice from sponsors and individuals. The exhibit will cost $1-million cash, with $500,000 in-kind equipment support. This will cover the costs of research, planning, design, fabrication, computer programming, evaluation, and marketing/promotion.

Sponsorship

The Networked Society provides a unique opportunity for corporate, foundation, and individual sponsors to be associated with a highly visible educational exhibition about the Global Information Infrastructure. All sponsors will receive prominent acknowledgement within the Museum, and in published materials and communications regarding the exhibit, including the ad campaign, press releases, posters, Museum publications, and educational materials.

Principal Sponsor ($250,000 and up)
As lead sponsors, Principal Sponsors will head the list of exhibit supporters. They will be prominently featured in all published material and promotions. They will be provided with 50 invitations to the exhibit's opening events, and time will be allocated for a special opening event during the exhibit's preview week.

Application Area/Technology Sponsor ($100,000)
Application Area/Technology sponsorship provides an opportunity for a sponsor to support an area of the exhibit that is related to the industry in which they are involved. Application Area/Technology Sponsors will be listed in all related materials, and be will provided with 25 invitations to the exhibit's opening events.



Sponsor ($50,000 to $99,000)
Sponsors will be listed in all related materials, and be will provided with 10 invitations to the exhibit's opening events.

Fundraising Status for The Networked Society as of 6/2/93

	Staff	Board	Company	Contact	phone	Next Step	Action Taken	Comments
1	OS GB	CZ PS	AT&T	Saul Buxbaum, Victor Pelson		--OS call Paul Karroff -- Gwen call Carl Ledbetter	- OS sent Clark prop. 7/31, OS send Slides on 4/15 as Communications Sponsor at $200,000	
1	OS		DEC	Nancy Dube, Bill Johnson	508/123-4567	--OS call Nancy Dube about lower price on Connectivity Sponsor --DG call Ed Delayney re:LanCity connection	pitched as part of 3-year plan, send prop. v1.1 7/8/92, given Connectivity Sponsor Slides, pitched at $200,000	
1	OS		Wellfleet Communications	Paul Severino	617\123-3655	OS, Gardner, DG meet with Paul - propose Lan/WAN network within an Application Area of his choice		
1	DG		NEC	Kobayashi		-DG check into link to Networking -DG call Tom Franklin re: Dick Underwood (head of NEC ops)	OS has written Unohara per suggestion of Eric Bloch, GB wrote Kobayashi 9/3	
1	DG	GH	Stratus	Bill Foster, John Goodwin	508/460-2000	DG called Goodwin 5/12 - he will come here June 9- we will come up with pitch, see how he talkes to it, and then OS, GH and DG will take it to Foster ($100,000)	OS, GW met Goodwin 12/92	
1	DG		Banyan	Dave Mahoney, Siobohan Cohen	508/836-1886	-DG ask GW about Siobhan Carrol -Wait until we hear from Novell	- spoke w/ Mahoney @ breakfast, sent prop v1.3 11/6, S. Carol handling, GW spoke Carol 3/1-sent prop v1.3 3/3/	
1	DG		Novell	Terri Holbrooke, VP Corp Com, Martha Felt, Scott Ford	801/429-5829, -3080 (TH's), -5643 (SF's)	-DG call Nelson re his meeting with Jan Newman, Excecutive VP -DG send Corp proposal to Holbrook	sent prop v1.3 12/18, met Holbrooke and Ford 1/12, sent follow up, spoke Ford 1/27, D. Nelson chatted toJan Newman 3/3	
1	DG		3Com	David Abramson, Bill Swift		-GB to talk to Payne about contact	- sent prop.v1.1 7/8/92 - OS visited Abramson in CA 7/13?/92	
1	OS		Thinking Machines	Sherly Handler Cheryl		--GB to talk to Harvey Weiss		
1	OS		S.W.I.F.T.	Peter Drummond, Jessica Kuborn		-OS/DG talk to Shrank after Break Sem	- Greg met w/ 5/11/92	
1	DG		NSF	Barbara Butler, Dave Staudt, Dan VanBellenghem (CISE)	202/357-9717 dvanbell@nsf.gov	-DG to write proposal	GW lm Staudt 2/17, spoke VBell 2/19, sent prop v1.3 & CDC	
1	DG		NEH	Tim Meagher, Fred Miller, Marsha Semmel		Prelim Sent. -DG/GW to work on details of proposl beforeJ June 4 deadline	- Greg has spoken to sent prelim. proposals to Meagher/Miller, OS call Semmel re museum workshops , TNS project: challenge real need	
1	DG		Rockwell	James Sutter, Dana Abrams, Dave Fox		-DG research link -DG call Abrams 310/797-1716	- OS spoke w/ Sutter— GW spoke Dana 12/21lm1/27/93, spoke 1/28, pithing Fox	
1	OS		Markey US Congress	Mark Horen		-OS call to see if he will come		
1	OS		Vice President Gore			We need to think of way to get him to opening		

Fundraising Status for The Networked Society as of 6/2/93

	Staff	Board	Company	Contact	phone	Next Step	Action Taken	Comments
1	OS		Bull	Alex Blois		OS to call to discuss proposal		
2	OS	Case	IBM	Parkel, Armstrong, Case		-OS approach in Sept. 1993 for 1994 support	- OS sent prop v1.1 to Pollard 7/87/92 - OS/GW met 11/11, sent Funk prop.	
2	OS		Proteon	Patrick Cortin (pres.) Howard Salwan (chair.)		-DG talk to Gardner about contacting Salwan.		
2	OS	GH	Cisco	John Morgridge	415/326-1914	-OS try to set up appointment after we talk to Severino		
2	GB		Cabletron			-GB to talk to Payne about contact		
2	GB		Bellcore	George Hielmeier		- GB to call to speak at seminar		
2	GW	PS	Sprint	Ron Pounder		-Mckenney speak to Cash -OS/DG bring up when talking to Paul	GW to follow up w/ fellow from brainstorming	
2	OS DG	IS PS	MCI	Dick Liebhaber		-OS/DG bring up when talking to Paul	Sitkin sent ltr w/ propv1.2 8/10/92 JW spoke "no $" but tryto set up mtng	
2	OS DG	CZ	NYNEX	Paul O'Brien, Cas Skrzypczak		-OS follow up on Caz calls (May 7th)	- sent proposal from CAZ to O'Brien 1/19/93	
2	GB		EDS	Jeff Heller		-GB to call Susan Parrish for EDS contact.		
2	GB	GH	Chipcom	David Fowler		-DG call Rick Burnes about his -DG ask GW about where this went	GW sent prop. v1.2 8/21/92	
2	GW		3M Telecom Systems	Cary Williamson @ Miller Communications	214/233-0956	-DG think about this one	- JO sent brief summary to Williamson 6/3/92	
2	GB		NetFrame	Enzo Torresi		-DG do Ziff search - Gwen set up mtg in CA	- Gwen saw at Shaeffer's conference-will give Netframe server	
2	OS		Hewlett-Packard	Jim Bell, Eichorn		-OS call to set up meeting with Eichorn, send Corp propoal	- OS met w/ Bell 7/9/92, invited to be advisor-declined-offer some one else	
2	OS		Unisys	David Curry	313/972-7835	-Meeting in June set (no date yet)	- OS sent prop. v1.2 8/6/92,, Sitkin sent John Holton prop., 8/13, OS spoke Curry 12/3-"no project 'til 94.	

Fundraising Status for The Networked Society as of 6/2/93

	Staff	Board	Company	Contact	phone	Next Step	Action Taken	Comments
2	GW		DARPA	Squires, Dwayne Adams (Dep. Dir.)	703/696-2226 703/696-2402	-DG check with GW on this		- sent Squires prop. v 1.2 7/23/92, sent copy to Vint Cerf and tried to follow up-
2	OS		Frito-Lay/PepsiCo.	Allen Deering (Pepsico) Osborne,		-OS contact John Osborne with TNS corp proposal		
2	GW		GTE	Bill Griffin, Walter Carlton		-DG talk to GW about this, then set up meeting w/ OS and Carlton	OS sent prop. v1.2 8/14, invited to RSM opening, OS/GW met Carlton	
2	GB		AMD	Tony Rea		-GB call and see if they're interested		
2	GW		Bomara Associates	Glen Seaman	508/452-2299	DG ask GW about this	- sent prop v1.2 8/25/92	
2	GW		Ziff-Davis	Bill Machrone, Bill Ziff		-OS call Ed Belove		
2	DG		American Management	Greg Pellegrino		-DG call Greg Pell.	David sent prop. v1.2	
2			Northern Telecom	Roy Merrills, Pres. Paul Stern, Chair.		-OS meet with Roy Merrils ???	- Sitkin spoke w/, trying to sched. visit, sent propv1.3 12/18	
2			Bell South	Al Jones	408/853-945	-DG call Al Jones (first check if GW called)		
2	OS	McKenny	Union Pacific	McKenny's contact		Jim to talk to Union Pacific Contact		
2	DG		Addison Wesley Publishing Co.	Pradeepa Siva	944-3700	-DG Follow up with someone within org - try to pitch idea of Information Sponsor	David talked to Pradeepa - will send books on Networking	
2	DG		US West	Robert K. Heldman		-DG to send letter complementing book on network		
2	OS		SUN	Dorthy Torell		-OS meeting Dorthy on June 23 to talk about TNS		
2	GB		Arthur Anderson	Akiba Herman		-GB call Akiba		
2	OS		Microsoft	Rodger Heinen		-OS to try and set up mtg with Gardner,Gordon		

Fundraising Status for The Networked Society as of 6/2/93

	Staff	Board	Company	Contact	phone	Next Step	Action Taken	Comments
2	OS		Lotus			-DG to look into linking to Notes		
2	GB		Synoptics	John Payne		-GB to talk to Payne about contact		
2	GB		Network General	Harry Saahl		-GB to send NSF proposal		
2	DG		Motorola	Laura Jenks		-DG to work on video phone system, then discuss funding.		
2	GB		Adobe	Warnock		-Gordon to call Geshke		
2	OS		Blue Cross	Richard Taylor		OS to call		
3			CONVEX					
3			M/A-COM					
3			Tandem	Jim Treybig				
3	GW		Walmart			get annual report		
3	OS		Bank of Boston	Michael Simmons, Warren McFarrlen (sp?)	434-6464		- McKenney spoke w/ McFarrlen	
3	JO		Compuserve	Tibor Vais, Charlie Terry				
3			Dow-Jones					
3			Mead					
3			Dunn-Bradstreet					

Fundraising Status for The Networked Society as of 6/2/93

	Staff	Board	Company	Contact	phone	Next Step	Action Taken	Comments
3			Prodigy					
3			Sears					
3	OS		Corporate Software, Inc.	Morton Rosenthal			- OS met w/ Rosenthal and Rotenburg 7/16, sent prop. v1.2 7/23	
3			Toshiba					
3			Fujitsu					
3			Nippon Telephone & Telegraph					
3			Hitachi					
3			Verifone					
3			Pactel	Hancock				
3			Consolidated Freightways					
3			Teleport			- McKenney call president		
3	GW		Reuters			- Greg contact Jon Eklund to get name at Reuters		
3		JMc IS	Air Products	Pete Mather		- McKenney call - Sitkin knows Mather		
3			Fidelity			- talk to Linda Bodman about getting contact thrugh Sam		
3			Informix	Chuck House		- meet w/ House at board meeting		

Fundraising Status for The Networked Society as of 6/2/93

	Staff	Board	Company	Contact	phone	Next Step	Action Taken	Comments
3			GAP			- Mckenney call Jiro (sp?)		
3			Thomas Cooke Travel					
3			Hughes	Michael Armstrong (CEO) Wayne Shleton (Div. Hd)				
3			TRW					
3			Equifax					
3			RBOCs					
3			Picturetel	Norman E. Gaut				
3			Skypix	Howard M. Lefcowitz, Pres.				
3			TV Answer	Richard R. Miller, COO				
3		IS	Humana	Fred Pirman (sp?)				
3			Dialog					
3			America On-line					
3			MITRE	Barry Horowitz, Nelson Bollan				
4	GB		Xerox	Seeley-Brown, Weiser, Bill Spencer, Wallington		JO set up meeting at Fnd., have GB follow up ltrs to S-B, OS follow ltr to Wallington --losing money at this time.	- sent prop.v1.3mod to Fnd., request for endorse to S-B fr. GB, Wallington fr OS	
4	GW		American Airlines	Max Hopper, Karen Cook	817/963-2009	GW call Cook: lm 1/28, 2/4, spoke 2/8/93--"no $"	OS spoke w/ Cook 11/30, sent Cook prop. w/ AA piece 12/18	

Fundraising Status for The Networked Society as of 6/2/93

	Staff	Board	Company	Contact	phone	Next Step	Action Taken	Comments
4	GB		Amdahl	Gene White		GB and OS meeting Lloyd Dickman, 11/3/92. Losing money at the moment.	- OS toured on 7/21	- CC prospects, do 800 numbers
4	GW		QED	George Fosque	617/225-2510	- Greg call and send proposal not a funder	- OS met at opening	
4	GB		Cadre Technologies, Inc.	Louis J. Mazzucchelli, Jr.	401/351-5950	- GB follow up	- OS met w/ WHEN?	
4	OS		Mitch Kapor	Mitch		not a funding source	sent proposal v1.2 8/7/92	
4	OS		Society of Information	Pat Wallington (Xerox)		Not a funding source	- Wallington giving talk at Museum	
4	DG		Markle Foundation	Geller		Don't seem right		
4	GW		CNRI	Vint Cerf, Bob Kahn	703/620-8990	--Not a funding source	Cerf wrote 1/25 "no $"--ISOC andorse CDC idea	
4	OS		Sloan Found.	Hirsh Cohen			OS spoke --"not in field of activity"	

Gardner -
Here is the prelim
NSF grant I mentioned
in my phone message.
I'm trying to collect
comments by Aug 20.

Thanks for
looking at this -

Dan S

PROJECT DESCRIPTION

THE NETWORKED SOCIETY EXHIBIT: DESCRIPTION OF WORK

The Networked Society: An Exhibit on Networks with National Impact

The Computer Museum requests funds from the National Science Foundation to help support the research, planning, and implementation of "The Networked Society" (provisional title), a major exhibition that explores computer networks, their technology, applications, and impact on society. This 5,000-square-foot (needs to be in metric) exhibit, opening November 1994, will be the world's first exhibit to focus solely on computer networks and their impact on the growing National Information Infrastructure. It will provide the public with first-hand experiences with networks, and give them a broad and balanced view of the network technology they use and rely on every day, often without knowing it.

The exhibit will not only be about the National Information Infrastructure; it will become part of it. To provide the public with real experiences on networks, the exhibit will include connections to remote locations (other museums, malls, libraries, public spaces) across the nation. This will not only give visitors in the exhibit a compelling experience with networks, it will also allow participants who will never be able to visit the Museum the opportunity to interact with some of the exhibit's activities. In addition, there are also plans to allow anyone who has a modem to access the Museum to download the text, images, and sounds of the exhibit. And for those who have not yet connected to the National Information Infrastructure, the Museum plans educational materials that will provide information for teachers, students, and visitors (on-site and off-site) on how to access networks that will be of use to them in their daily lives. Thus, this exhibit has the potential for significant national impact.

By becoming part of the National Information Infrastructure, the Museum is not only extending the impact of the human capital invested in the exhibit; it is also redefining the notion of a museum exhibit, from one where access to the educational information presented in the exhibit is severely limited by time and space, to one where access is limited only by the ability for people to connect to the National Information Infrastructure. As computer networks transform the nature of information, this approach can serve as a model for other museums across the nation.

Computer Networks: An Emerging Infrastructure Changing Our World

Computer networks span the globe and increasingly are a part of almost every facet of modern society: engineering, medicine, communications, education, government, transportation, and commerce. They control the lights and heating in buildings, oversee auto, airplane, shipping, and satellite traffic, and record transactions of all sorts, from stays at hospitals to purchases at the corner store. They are an essential part of living in the modern world.

The Computer Revolution of the last 50 years will seem merely a prelude to the technological and social changes of the Information Revolution heralded by networks. As computer networks continue to spread, making their way into our offices and homes, they will affect how we work, how we entertain ourselves, how we interact with others[1], and how we define ourselves as individuals and as a society.

However, because computer networks are, for the most part, invisible, most people do not know how they work and how much they influence their lives. Indeed, many people do not even know that they exist. To make this invisible infrastructure visible, The Computer Museum is creating *The Networked Society* exhibit.

The Networked Society Exhibit: Educating the Public about Computer Networks in an Informal Learning Environment

The Mission of The Computer Museum is to promote the understanding of computer technology, its applications, history, and impact among people of all ages and backgrounds. The Museum has fulfilled this mission by doing exhibits on the technology and applications of personal computers, robots and artificial intelligence, computer graphics, and computer history. However, it has yet to do an exhibit on large-scale computer networking, an area that some estimate takes up to 70 percent[2] of all computing power. With computer networks becoming ever-more pervasive in every aspect of society, it is critical that if the Museum is to fulfill its educational mission, it needs to do an exhibit on this subject.

While much has been written on the subject of the National Information Infrastructure, the Museum can play a unique role in raising public awareness about this important technology. As an environment for *informal learning*, the Museum will provide the opportunity for people to have *first-hand* experiences with networks. Equally important is that these networks will be presented within a context where important issues about the technology – how it is applied, how it works, and its impact on society – is carefully integrated into the experience so visitors get a balanced view and gain meaningful knowledge about the subject.

Informal learning environments, and specifically museums, have a unique role to play as part of the educational infrastructure of the Nation. Museums, like libraries, are resources where people from all ages and backgrounds can learn in a voluntary, self-directed fashion, driven by natural curiosity and the excitement of exploration. The difference is that libraries provide a vast range

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[1]A colorful illustration of this comes from the Well, a popular bulletin board system located in San Francisco's Bay area. Using the network, a man was having a "serious relationship" with two (and perhaps more) women at the same time. When his deed was uncovered, he defended his actions by replying, "I didn't think that the same concerns about fidelity I apply reflexively in physical relationships applied here in cyberspace." From *On-line Lothario's Antics Prompt Debate On Cyber-Age Ethics*, article by John Schwartz, The Washington Post, Sunday, July 11, 1993, pg.1

[2]Need statistic for this!

of in-depth information – mostly text- and image-based – without an overriding theme or context. Museums tend to focus on specific subject matters, and are often object based rather than text based. They structure and synthesize information in an effort to present core ideas about the topic at hand. They also provide a *three-dimensional environment* that supports educational experiences through access to real examples of the subject matter, manipulation and task completion, play, social interaction, and multi-sensory experiences. As such, museums' greatest role is to *inspire* the public in a number of different ways: to some visitors, the basic issues they learn about in a science exhibit will provide them with a better set of tools to judge science topics when they are discusses in the print and electronic media; to others, a science exhibit may inspire them to further investigate the subject by visiting a library or taking a science class; and for some, it may be the start of a life-long passion and career[3].

How does this apply to *The Networked Society*? The exhibit will be an informal learning environment in that visitors will *observe* and *try* real computer networks, *handle* the basic technology that makes them work, *face* the ethical issues that arise from the use of networks, and through real examples, gain an appreciation for how this technology is impacting society. For example:

- Visitors will *watch* how the Boston's Central Artery/Tunnel Project, the largest urban project ever undertaken in the United States, uses computer networks to perform real-time traffic flow control; at the same time, visitors will be able to *use* the same network to find out the most efficient way to get home from the Museum.
- Visitors will have to *make decisions* about the privacy of the data they generate in the exhibit – *do they want the destination address they placed in the Central Artery/Tunnel computer to remain indefinitely*?
- Visitors will encounter descriptions of real people impacted by networks, from telecommuters describing the pluses and minuses of working remotely to data-entry personnel whose every keystroke is recorded by a computer. These descriptions will prompt visitors to think and question how this technology impacts their own life and the lives of those around them.
- To gain an appreciation for the core technology that makes networks work, visitors will handle copper and fiber optic cabling, experiment with different levels of bandwidth, and put together a simple network.
- For those visitors who wish to continue explore networking after their Museum visit is over, they will be provided with information about resources where they can further pursue their interest.

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[3]Ask Gwen for her good example about this.

The Networked Society Exhibit: Objectives

The Networked Society exhibit has six main objectives:

1) Promoting Network Awareness/Literacy - While a majority of Americans can claim some proficiency with personal, stand-alone computers[4], far fewer know that computer networks even exist, despite the fact that people are impacted by networks on a daily basis (i.e., people use them every time they pick up the phone or use an automatic teller machine). The widespread use of computer networks has profound implications for the basic tenets of American government, society, and way of life; an exhibit about networks will help make citizens more informed about this important technology.

2) Highlighting the Applications of Networking - The first step in providing people with a better understanding of networks is to show how the technology is being used on a daily basis. The exhibit will highlight the many applications of networks, from the airplane reservation system, to the phone system, to how research facilities uses Internet, to efforts at electronic democracy. When possible, there will be the opportunity for visitors to have first-hand uses with these networks.

3) Highlighting the Technology of Networking - In order to fully understand the impact of networking, the general public needs to gain a better understanding of fundamental concepts about networks. The exhibit will highlight these issues by focusing on topics such as what a network is, how a connection between two computers is made, the scale of networks (LANs, MANs, WANs), how information is processed on a network, and the importance of bandwidth. Related to this will be a presentation on the evolution of networks, and the relationship between the telecommunications infrastructure and the National Information Infrastructure.

4) Raising the Social and Ethical Issues of Networking - The exhibit will also demonstrate the impact this technology will have on the way we work, play, interact with others, and think about ourselves, highlighting issues such as telecommuting, privacy, and the changing nature of communication. Visitors will face these social and ethical issues and make choices about the rights and responsibilities of being citizens in a Networked Society.

5) Reaching A Diverse and Underserved Population - The Computer Museum is committed to serving a diverse community and designs its programs to be accessible to underserved audiences and those with special needs.

Computer networks have great potential for making a difference for underserved populations; unlike most educational resources, the information available on networks are not tied to a specific location. However, as was the case only a few years ago with personal, stand-alone computers, there presently exists a great division between those who have access to networks and those

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[4]Stats needed here!

who are not able to become part of the National Information Infrastructure. Often this division reaches across economic and racial lines, with the more affluent being in the right environments (corporations, universities) where knowledge about networks is most accessible.

The Networked Society will place special emphasis on reaching diverse and underserved audiences. Efforts to reach these groups will include:

- Designing exhibit activities so people from all backgrounds will be able to relate to the subject matter. Many network applications have global and corporate associations that may be unfamiliar in certain communities; it will be important, therefore, to emphasize local models, such as the impact networks have on the home.
- Including examples of peoples from a range of backgrounds, races, and economic situations when highlighting individuals impacted by networks.
- Writing the exhibit text so it is accessible to those with a 6th grade education or higher. The Museum has done this in the past by having all exhibit text reviewed by a 6th grade class from the Martin Luther-King Jr. Junior High School. The students checked for unclear terms and concepts.
- Develop educational materials that will focus on practical information about how to gain access to the National Information Infrastructure.

6) National Impact - *The Networked Society* is planned as a permanent exhibit, reaching approximately a million visitors during its life at the Museum. It also has the potential for being a resource about networks beyond the walls of the exhibit, reaching a far greater audience. By structuring and synthesizing information, museums often develop text and images that provide a clear introduction to a subject.[5] For *The Networked Society* the Museum will provide parts of the text, images, sounds, and interactive software from the exhibit on-line so that people who cannot reach the Museum will be able to access some of the intellectual capital generated by the exhibit[6]. For example, one can imagine a school in Nebraska or Hawaii taking a "field trip" to the exhibit. Indeed, such on-line based outreach (one might call it "Inreach") will complement the experience for all involved, since remote visitors will be able to "chat" real-time with visitors in the Museum.

Another aspect of National Impact will be the development of educational materials. Consisting of printed materials, the educational materials will

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[5]An example of the applicability of museum text and images to other learning environments can be found with a temporary exhibit The Computer Museum recently completed on programming languages entitled, "From Concept to Code." TEACHER NAME, a teacher from CITY, requested a copy of the signage from the exhibit to use in her class to introduce students to programming languages. (Ask Carol for name of teacher).

[6]People will be able to access elements from other Museum exhibits as well; i.e., a timeline history of robots and artificial intelligece located in the *Robots and Other Smart Machines* exhibit.

provide activities for visitors within the exhibit[7], as well as provide information about resources where people can further pursue their interest in the subject. A modified version of the materials, including software that help people connect to the exhibit, will be designed for remote visitors. The focus of these materials will be for individuals who have not yet had the ability to become part of the National Information Infrastructure, and will go over the basics of how to connect to this infrastructure (i.e., what a modem is, how to use it with a personal computer).

Relation to the Long-Term Goals of The Computer Museum

People come from all over the world to The Computer Museum, the only one of its kind. Its programs are designed to be accessible to ages 6 and up, techies and non-technically-inclined alike. Since it was established as a non-profit, the annual number of visitors to the Museum's exhibitions has more than tripled, from less than 40,000 to more than 140,000.[8] In opening *The Networked Society*, the Museum will be focusing on two long-term goals that the institution has set for itself:

1) *Completion of the Museum's Five-Year Exhibit Plan*:
The Networked Society exhibit is the last leg of a five-year plan the Museum's board implemented in 1989 that shifted the Museum's original focus as a collecting Museum to one where educating the public about computing is the primary mission. The five-year plan stipulates that a new exhibit open every year, with a mix of presentations on the history, technology, and applications of computers.

Exhibits on the technology and history of computers were completed first. Beginning in 1990, the Museum opened *The Walk-Through Computer*, a 50-times larger than life working personal desktop computer that highlights how computers work. In 1991, the Museum opened *People and Computers: Milestones of a Revolution*, an exhibit documenting the history of modern computing, from the 1930's to the 1990's.

In 1992 the Museum began focusing on computer applications. It opened *Tools & Toys: The Amazing Personal Computer*, an exhibit that shows visitors the many uses of the personal computer, from graphics, to mathematics, to music, to writing. In 1993 the Museum opened *Robots & Other Smart Machines*, a renovation of an earlier exhibit demonstrating artificial intelligence, artificial life, and robotics. *The Networked Society* exhibit will complete the five-year plan by highlighting the invisible but pervasive use of networks in all aspects of modern life.

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[7]See examples from the Museum's *Educational Activity Packet*, Appendix X. This packet is used by students before and during their visit to the Museum in order to provide activities that bring them closer to the material being presented. (Natalie? is this a good description?)

[8]50% of the Museum's visitors are students, and 50% are adults (only 35% of whom come with children). One third of students (K-college) come in organized groups. Visitors come from a wide geographical area: 42% are from MA; 14% come from other New England states; 30% come from states outside of New England; 14% come from outside the U.S.

2) *Reaching National Impact*: A primary experience at The Computer Museum is interacting with computers. In total, there are over 120 computer-based exhibit stations at the Museum. This puts the Museum in a unique position to extend the human capital in its exhibits beyond its walls by providing the software that runs these exhibits to other locations. Already the Museum has sold over 30 Exhibit Kits, a project supported by the NSF[9] that exports the Museum's best software to other museums (and one university) around the world. Through exporting exhibits, the Museum has increased its impact by an estimated 30 million visitors in the last three years[10]. By making *The Networked Society* part of the National Information Infrastructure (remote locations, access on Internet, educational materials instructing people on how to connect to the exhibit), the Museum will be able to reach out to far greater audience.

Relation to the Present State of Education about Networks in Museums and other Learning Environments

There are a number of projects and commercial enterprises where can people learn about and gain access to networks. What follows is a summary of some notable examples, and a description of how they relate to *The Networked Society* exhibit.

Other Museums

Many science museums have exhibits on communications, and some of the more recent exhibits on this subject have highlighted computer networks[11]. What distinguishes *The Networked Society* from these exhibits is that instead of placing computer networks within the context of communications, it will be the first exhibit*dedicated solely* to computer networks. As a museum exclusively dedicated to computers, The Computer Museum is in a unique position to place networks within this context; it has the experience[12] and archives to complete a comprehensive presentation on the subject of computer networks.

Formal Learning Environments

A number of learning environment other than museums have been involved with educating people about, and providing access to, computer networks. Many of these have focused on students, teachers, and scientists collaborating

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[9]NSF award number 8955342

[10]Get stats on this!

[11]One recent example is the Chicago's Museum of Science and Industry Communications exhibit that opened in April of 1993. (more about this --- get info -- show what they included on networks.

[12]The Computer Museum's Board of Directors include a number of leaders in the field of networking: Paul Severino, Founder and CEO of Wellfleet, one of the largest internetworking companies; Caz SXXX, XXX of NYNEX; David Nelson, Founder and CEO of Fluent, a company that focuses on networked videoconferencing; and Mitchel Kapor, Founder and Director of the Electronic Frontier Foundation, a non-profit organization ... (get info--- is Mitch really a board member???)

across large physical distances to pool disparate resources and bring together communities with similar interests. The projects often have a strong component of educational reform; they are designed with a vision that network technology, by encouraging learners to be collaborators, can act as a mechanism for change in the national schools system.

The most notable and largest of these projects is the National Geographic Kids Network Project[13] where students use networks to share data about their local environment (i.e., rain water acidity) with other scientists and students at locations around the world. They develop a shared database of information which they use together to do scientific analysis. LabNet,[14] developed by many of the same organizations who designed the Kids Network Project (most notably the Technical Education Research Center in Cambridge, Mass.), is a nationwide network for science teachers designed to promote remote collaboration and the sharing of ideas and information about science education. Common Knowledge: Pittsburgh,[15] is a project designed to test the costs and effectiveness of integrating a computer network into a large public school system. Students and teachers will use networks to access data and individuals outside the classroom, and teachers will use the network to developed, distributed, and test new curriculum.

The projects describe above give a *specific audience,* students and teachers, the opportunity to use networks first-hand for real work, and allow for substantive relationships to blossom over the networks. They are also focused on specific applications. *The Networked Society* exhibit, while not designed to provide long-term experience with networks, will give a *broad* audience access to networks, and provide a "big picture" view of the variety of networks that exist in the world.

Libraries and Fee Based

The New York Public Library is planning the Science, Industry, and Business Library (SIBL), a public information center slated to open in late 1995 that will "connect on-site and remote users to hundreds of internal and external electronic information resources." [16] As its name states, the library will focus on Science, Industry and Business, with materials including electronic business and scientific resources and a comprehensive collection of U.S. and foreign government documents and patents, and a training center targeted at small businesses to teach them about using computer networks.

Millions of people subscribe to on-line services where they trade information and opinions, get the latest news, shop, and play games together. They do this through the thousands of small bulletin boards run by hobbyists and with the big commercial ventures like CompuServe, Delphi, America On-Line, Prodigy and GEnie. Many gain access to these networks with the help of computer-user groups, such as the Boston Computer Society and the Berkeley

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[13]NSF award number 8652120

[14]NSF award numbers 885065 and 9155358

[15]NSF award number 9253452

[16]Science, Industry and Business Library Fact Sheet, 3/93. The New York Public Library.

Users Group. This may be the easiest way to become part of the National information Infrastructure, and the exhibit plans to highlight this component of networks. However, as comprehensive as these networks may be, they do not touch on how large global networks work (the phone system, credit card network), or focus on the technology of networks.

In summary, when comparing *The Networked Society* exhibit to the present state of education about networks, there are two components of the exhibit that makes it uniquely different from the network-based projects describe above:

- For many the exhibit will be a first introduction to the subject. While the other projects assume a certain level of knowledge about networks, the exhibit will introduce networks to people who may not even know they exist.
- The exhibit will show the *many different ways* networks are used; the projects described above are focused on specific applications of networks.

Relation to The Computer Museum Work Completed Under Other Support

The Computer Museum has worked on three projects that have raised issues that will be part of *The Networked Society* exhibit:

1) *The Networked Puzzle*: This exhibit, sited within the *Tools & Toys: The Amazing Personal Computer* exhibit, highlights how computer networks are involved with person-to-person communications and the transferring of data. Consisting of five networked Macintosh computers (four clients and a server), visitors work together to find pieces of a puzzle that they are trying to complete as a group. Each person has pieces to the puzzle that other people need, prompting them to use the network to communicate with other visitors. Once they find a visitor who has the piece they need, they use the network to "transfer" the piece from one station to another. (see Appendix for illustration of Networked Puzzle exhibit).

Of note is the notion of *collaboration* that underlies the Network Puzzle. When first planning to highlight networks in *Tools & Toys*, the Museum researched other examples of networked activities. All the examples it found were effectively "shoot em up" games, such as a network activity at the Franklin Institute in Philadelphia (three people navigate through a maze using arrow keys and "zap" each other upon meeting), and Battle tech, a networked virtual-reality based tank battle system in Chicago. While entertaining, the Museum felt that real-life network applications (e-mail, groupware) encourage collaboration and sharing; thus evolved the idea of a networked group activity where the goal is to put together a single puzzle.

The lessons learned from this project have direct implications in the development of the interactive components of *The Networked Society*. Standard procedures about designing interactive exhibits change when applied to a multi-visitor networked computer exhibit; for example, while a "time out" program resets a single-visitor exhibit if it has not been touched (no keystrokes or mouse movements) in 90 seconds, it was discovered that if one

of the four players in the Network Puzzle left in the middle of the game, resetting the exhibit would mean the three remaining players would have to forfeit their experience. The designer of the exhibit solved this problem by automatically distributing the pieces of the puzzle to the other players in the exhibit.

2) *CompuServe Front End*: This exhibit, also located in the *Tools & Toys* exhibit, was the result of evaluating visitors' interactions with the standard text-based interface with CompuServe, the large commercial on-line service. Evaluation showed that many first-time users to the service felt uncomfortable with the interface, and often did not get beyond the first menu, missing most of the information available. The Museum built a front to this service, explaining the log-on procedures (what the high-pitched sound of the modem was), and then offering a limited but easily accessible choice of information through a mouse-based interface. Evaluation of the exhibit found that such an interface allowed for a much broader group of visitors (especially younger visitors) to gain access to the exhibit, and that users spent a longer time at the exhibit than under the earlier interface (see Appendix for illustration of the CompuServe Front End).

3) *Person-To-Person/E-mail The White House*: These two exhibits, funded by a planning grant for *The Networked Society*, are the Museum's initial interactive developments for the exhibit. As mentioned above, the Museum seeks to connect Museum visitors with remote sites, as well as provide the opportunity for them to use real networks; these two exhibits are preliminary efforts to deal with both these issues (see Appendix for illustration of both these exhibits).

Person-To-Person is an exhibit that will connect the Museum with an off-site location using beta software developed by Northern Telecom and Motorola. The software allows people to communicate using video over telephone lines and draw a picture together. The project is testing a number of questions that arise when developing remote site exhibits: what kind of activities will work with visitors at different locations who most likely will be meeting each other for the first time? how does one maintain a computer exhibit that is located remotely? what are the costs of using the telephone system?

E-mail the White House is an exhibit that uses the connection the Museum has to Internet. Visitors will be able to write an electronic message to President Clinton or Vice-President Gore, and then see how the message is routed through the web of machines that are part of Internet. This exhibit seeks to highlight the three facets of networking that *The Network Society* exhibit is showing: network applications (electronic democracy), technology (how the message is routed through Internet), and the social/ethical impact.[17]

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[17]To maintain the freedom of expression involved in the exercise, while also protecting the Museum against accusations of slander and defamation, the following footer is placed on each e-

THE NETWORKED SOCIETY EXHIBIT: GENERAL PLAN OUTLINE

Making the Invisible Visible: Approach & Design

The challenge in the approach to, and the design of, *The Networked Society* is this: How does one take the six objectives of the project –

- Promoting Network Awareness/Literacy
- Highlighting the Applications of Networking
- Highlighting the Technology of Networking
- Raising the Social and Ethical Issues of Networking
- Reaching A Diverse and Underserved Population
- National Impact

– and turn them into a substantive, educational, and compelling exhibit?

During the pre-planning process for this exhibit, the Museum developed a series of guidelines to assist in making the exhibit a rich informal learning environment, and provide a framework in which to apply the six objectives mentioned above. The guidelines are as follows:

- *The exhibit should be a place*: One can divide science exhibits experiences into two basic groups; exhibits *about* a subject, and exhibits that are, *in themselves*, a subject. For example, the Museum's exhibit *Robots and Other Smart Machines* is an exhibit *about* robotics and artificial intelligence. One the other hand, *The Walk-Through Computer* is an example where the exhibit's setting is in itself of interest[18]. While the former connotes a more traditionally-based display of information, the latter is more closely tied to the concept of a museum as a *three-dimensional* informal learning *environment*. The Museum has found that when trying to show the small and the ordinary, as was the case with *The Walk-Through Computer*, visitors and the media (an important component in bringing in more visitors) tend to be attracted to unique settings and gain a better understanding of the concepts of the exhibit.

Because computer networks are mostly invisible, it will be important to create a strong sense of place in which to frame a topic that has very little physical representation. Therefore, *The Networked Society* will not only be an exhibit *about* the networked society that exists in the real world, it will also be a *place, a networked society* people can visit within the walls of the Museum.

- *The visitor experience should be activity-based*: The exhibit should focus on experiences people cannot get at other places. This means experiencing settings

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mail message: "*The Computer Museum believes in the freedom of expression and right to privacy for all its visitors. Therefore, this letter has not been read or edited by the Museum. As such, the content included in this letter does not in any way refects the opinions of The Computer Museum.*" By informing visitors that we are placing such a footer at the end of the message, we will be highlighting the ethical issue we had to deal with when desigining the exhibit.

[18]Perhaps the most notable example of such an exhibit is the famous larger-than-life heart at the Franklin Insititue in Philadelphia, PA. Other examples include living historical villages, such as Plymouth Plantation in Mass. and Williamsburg Colonial Village in Virginia.

they might never get to see (i.e., the the telephone control center) and learning concepts in ways where reading a book on the subject would have its limitations (i.e., experimenting with bandwidth by handling real examples of cables of different bandwidth).

•*The exhibit should be based on science-facts, not science-fiction*: While this seems unnecessary to state for a science exhibit, it is important to set as a guideline since the area of computer networks has, especially recently, become a topic of great speculation. Many of the aspects of the "Information Superhighway" concept recently described in the print and electronic media recently have raised expectations about this technology to unrealistic levels. While the Museum will show the cutting-edge applications of computer networks, equally as important will be to demonstrate the limitations of this technology, and to refute the myths that have developed around the topic.

•*There should be a variety of experiences*: A significant portion of The Computer Museum is designed for unattended hands-on experiences with computers. While Visitor Assistants (guides) are there to give tours and answer questions about the exhibits and any other need a visitor may have (such as the location of the nearest bathroom!), the majority of the spaces have been designed for the Visitor Assistants to have a reactive role in the exhibits.

This will change for *The Networked Society*. The Museum has found that while unattended hands-on exhibits are successful when demonstrating computer applications and explaining technical issues, they are not as effective when trying to raise social and ethical issues. Therefore, while there will be efforts to integrate social and ethical issues into the unattended exhibits, the Museum will dedicate space specifically designed for visitor/Visitor Assistant interactions where the focus of the contact will be based on facing the social and ethical issues related to computer networks.

The Networked Society: Layout

Based on the above stated exhibit objectives and guidelines, the Museum has developed the following preliminary layout for *The Networked Society*.[19] The exhibit has three main parts:

•Part I – *A Common Beginning* (500 sq. ft.)

In order to emphasis the feeling of *place*, to provide a variety of experiences, and to focus visitors to the subject at hand, the exhibit will begin with an introductory film introducing people to computer networks (5-7 minutes, in a theater designed for up to 25 people per sitting). Designed as an immersive experience covering two or more walls of the theater, it will take people on a journey through the world of networks and introduce them to the basic

[19]It is important to note that this is a preliminary survey of the exhibit. It is customary for such a project to evolve as advisory boards suggest new ideas, and front-end evaluation confirms or refutes certain approaches.

concepts that will be covered in the exhibit: what is a network? how are computers connected? how are they used? where did they come from? how are they impacting the world around us?

The film might begin with the sound of Morse Code filling the theater, as the screens show the growth of the communications networks, from the sparse beginnings in the 1850's to a brimming world filled with connections in the 1990's. To explain how computers transfer data to each other, one can imagine a scene where visitors "travel" like a pulse through a network at the speed of light; they start in Boston by going through the telephone system, up a satellite link over the United States, and then down into the maze of a local area network located in Singapore. There could be views of all the different ways people use networks, from a child lifting a phone to make a call, to two doctors discussing a shared networked view of a CAT scan, to an elderly person using an bulletin board in their home. The final scene could be filled with people from around the world describing why they use networks and how they have been impacted by the technology. And as the film ends visitors are asked, "How are computer networks a part of *your* life?[20]"

• Part II – *A Group Experience: A Networked Society* (1000 sq. ft.)
When the film ends, visitors are welcomed by a Visitor Assistant to the second part of the exhibit, a hand-on network representing different computer network applications. The space they walk into is ringed by a series of computer stations linked together with a network.

The Visitor Assistant distributes a smart card (or similar tracking device[21]) to each visitor and explains the activity that will take place for the next 15 minutes: The network around them represent a sampling of a "networked society," with each computer having a different network application – health care, finance, government, education, law enforcement, manufacturing, etc. Visitors will use the smart cards to go from computer to computer and become involved with *scenarios* they encounter at each station.

As each visitor logs in for the first time they get to choose a character who they will get to watch interact with the different networks. This *network guide*[22], who will appear to the visitor as a video talking head[23], could be a doctor, a child in the 6th grade, a spy, a law enforcer, a teacher, or an

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[20]The Museum plans to work with XXX, a world renound film maker, to produce this film (see Appendix X for letter of interest).

[21]The Museum is presently researching the different tracking devices available. Smart cards, while proven reliable, may be difficult for some visitors to use. Another alternative may be an active badge, a small microchip identity badge people wear on their clothing that would be automatically recognized by the computers. Both systems and more alternatives will be evaluted through visitor testing.

[22]The *network guides* will be an opportunity use examples real people from all backgrounds and ages; this will help in making people from diverse audiences visualize that they too are part of networking.

[23]For the Museum's hearing impared audience, all spoken dialogue will have subtitles.

oceanographer. As the visitor moves from computer to computer[24], they get to see how their *network guide* is impacted by the networks in the "society."

For example: A visitor, smart card in hand, begins by choosing a doctor as their *network guide*. The doctor begins by welcoming them to the networked society and tells them she looks forward to "traveling" the society together. She goes on to describe and illustrate with short video sequences how she uses networks in her work, from a system that automatically fills out patient reports and sends them across a network to an insurance company ("It saves me a lot of time - I used to have to fill out all these forms by hand and send them by mail"), to a high-bandwidth hook-up with a specialist where she can get another opinion about a patient's medical state by discussing a shared image of a MRI scan ("It can be of great help. Of course, I do miss the human contact – you can't go for a cup of coffee with a colleague over the network."). She then suggests the visitor try another station: "See you there!"

At the next station, the government network, the visitor is welcomed again by the network guide: "I use government information in my work, a lot of which is stored on networks I access with my personal computer. For example, I find out the *latest* information on the state of the flu epidemic that has broken out in my county. It tells me what kind of vaccines are resistant to the virus, and which ones work." (this monologue is supplemented by video of a search in the Center For Disease Control epidemic database). She then gives an overview of the government application area: "The government uses networks for many things, from an electronic-mail system where you can send a letter to the President from your computer, to very detailed data about the toxic waste that is generated in your neighborhood." (again, this dialog is supplemented by video sequences of the different networks she is describing).

At the end of 15 minutes, the activity ends and the group is gathered by the Visitor Assistant. They go into a "debriefing" room where they discuss experience they have just had. The Visitor Assistant will be trained to ask questions that bring forth a discussion about different aspects of networks, with special emphasis on the social and ethical impact of the technology. The level of discussion will be shaped by the age and backgrounds of each group. For adult visitors there could be a comparison of experience. For example, *how did the "visit" to the "society" differ for those visitors who chose to follow the doctor verses those who followed the spy? What kind of problems did each encounter? How might this apply to the real world?* For grade school groups, there may be a discussion of the different ways people communicate (they might act out the game of "telephone" using different network structures)

Why have a "networked society," *network guides*, and a "debriefing" room? This part of the exhibit fulfills a number of exhibit objectives and guidelines that are fundamental to the success of the exhibit. As described earlier, the Museum has found that unattended exhibits, while good at conveying

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[24]This is the primary reason for the smart card or similar tracking device; as the visitor moves from one application to another, there needs to be a way to track where the vistor is going so that his or her *network guide* can follow them around.

information about the technology and applications of computers, are not the best way to highlight social and ethical issues. By having visitors interact with a person trained to raise these issues there will a specific opportunity for these issues to be discusses.

Another reason for the "networked society" is that it will give people deep *sense* that networks are made up of computers connected to each other. This will be reinforced as they move from computer to computer and observe their *network guide* following them. While much of what people see and hear in the "networked society" could be presented in the introductory film, the impact of the information will be much stronger since visitors will have gathered it themselves.

•Part III - *Networks in the Real World* (3500 sq. ft.)
The final and largest area[25] of the exhibit will be a space where visitors can observe and interact with real networks in *application areas*. Each *application area* will be in a compelling setting; some will represent places where most people do not get a chance to visit, such as a phone system control center; others will be abstractions of ideas not tied to a specific application, such as an environment where people get to put together their own network. The goal of each area will be to give visitors a feel for how the network being highlighted works in the real world and, if applicable, will let the visitor use the network for their own purposes. When possible, the areas will highlight technical, social, and ethical issues related to the network; having already discussed and thought about these issues in the previous area, visitors will likely be more aware of the relationship between networks and these issues. There will be between six and eight application areas, five of which are described below:

1) *The Central Artery Control Center*[26]
Boston's traffic problems are legendary. The city's rambling streets follow a medieval "free form" plan that are based on cow paths from the 1600's. To integrate automobile traffic into this plan, the state of Massachusetts has planned a major renovation of the central roadway that passes through Boston The project is the largest urban development scheme ever undertaken in the United States; a new tunnel is planned to bridge the airport with South Boston, a series of overpasses are planned to re-route traffic from the North and South of the city, and a major new tunnel is planned to go under Boston to replace an overhead highway.

Computers are, of course, playing a major role in every aspect of the project. One of the most compelling applications is the use of a network to gather up-to-the-minute information about traffic states. The data is processed by an

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[25]Unlike the first two areas of the exhibit, this will be an open-ended space that has no time limit. For those visitors not able to commit to the time requirements of the first parts of the exhibit, they will still be able to enter this area.

[26]This application area has already been funded by a Major Sponsor ($100,000) grant from the Massachusetts Highway Department and Central Artery/Third Harbor Tunnel project.

expert system at a central control center to determine the most efficient routes in and out of the city. This information is gathered in a number of ways; digital cameras that can "count" traffic flow are positioned all over the city, their information networked to a control center; human monitors, located in viewing stations, automobiles, helicopters, send back information to the control center using cellular phones and radio communications.

The exhibit will recreate the projects control center. In a space positioned by a large window overlooking the real Central Artery, there will be live video feeds of the digital cameras monitoring the traffic, as well as a large display of the expert system that is processing the information (it has a vivid projection of Boston's streets). People will not only get to watch the network in action as the traffic conditions change; they will get to use the system for themselves. One of the features of the system is the ability to place in a start and destination address, with the result being a listing of the most efficient ways out of the city.

The setting also has the opportunity for a discussion of the technology of networks. Due to the large bandwidth requirements of the digital cameras, they will be linked from the control center to the Museum using fiber optic cabling. An explanation of this connection (the real control center is located half a mile away), as well as the cellular connections used by the human monitors, will give visitors a concrete illustration of the technology. There will also be descriptions of other networking technologies used in traffic control planned in the next few years for the project, such as automated toll collection using wireless technology. While this technology should cut down waiting time and auto emissions from idling cars, it also brings up a compelling ethical issues that visitors can face; *what is the difference between a computer tracking your car, and a computer tracking you? Could the information gathered be used against you?*

2) *Build Your Own Network*

In this area of the exhibit, visitors will be focused on the concept and technology of a network; they will encounter examples of non-computer networks they are familiar with (rivers, the Interstate Highway System, the post office, friendships, families), the different kinds of computer network structures (Ethernet, Token-ring, ARCnet, wireless), and network scales (LANs, MANs, and WANs).

All this information will be framed by a lab-like activity based on the principle that the best way to learn about a new technology is to build somethin with it; therefore, visitors will get to build their own computer network. They will have three types of pre-configured hardware boxes to choose from; an "end point," consisting of a screen and attached keyboard; a "hub," a connection for cables; and a "server," a central repository of information. With these three boxes and a variety of cables visitors will build a variety of different types of networks; "end points" could be connected to each, or they could be centrally connected using a "hub." Once built, visitors can use the network to communicate with each other using text and video (depending on the bandwidth of the cabling they've chosen).

This will also be another opportunity for the Visitor Assistants to take an active role in the exhibit. Designed as a group activity (one can imagine a family building a small network while a school group would build a fairly large system), the Visitor Assistant could have people pretend they are "located" at different sites around the world, and go over the different levels of network scales that link organizations remotely.

Another issue this area of the exhibit will cover is the modem, and how it links the "last mile" of telephone connections that still uses copper cables with digital technology.

3) *The Telephone Control Center*

Most people do not know that the phone system is a computer network. In this application area people will enter a setting that recreates a telephone control center. Visitors will be surrounded by large projections showing real telephone traffic[27] on multiple screens, flashing lights indicating different levels of telephone demands, and up-to-the-second news broadcasts (i.e., CNN), used in real telephone control centers to watch for unusual occurrences that will impact phone traffic.

While watching the real network will be compelling, it will, of course, not be possible for people to actually interact with the network. Therefore, included as part of the setting will be a simulation of the network; this way, visitors will be able to get a hands-on understanding of how people at the control center manage phone traffic. For example, they could encounter a scenario where suddenly a great demand is placed on phone circuits in a certain part of the country (such as is the case on Mother's Day). As people do in real communications control centers, visitors can respond to this problem by using the network to re-route calls through circuits with less demand.

Another way to demonstrate the phone network, while at the same time personalizing the experience for the visitor, will be an activity where people get to dial the phone number of anyone in the world (such as a friend or family member), and watch how the phone call is routed through the network.

4) *The Wired Home*

A comfortable living room, filled with a soft couch, a coffee table, and a rocking chair, surrounded by painting and photographs: this is not a setting most people associate with computer networks. And yet, as networks begin to reach into the home, both through the telephone and cable systems, people are shopping for clothing, renting movies, ordering food, and getting all sorts of information sitting in their bedrooms, kitchens, and living rooms. Whether

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[27]The Museum is discussing the possibility of "tapping into" the phone traffic data with a number of phone carriers.

through a personal computer, telephone, or television, they are using networks linking them to the rest of the world.[28]

While a computer-savvy audience may find this all quite ordinary, the familiar, recognizable setting is deliberate. Designed to reach an audience who may have very little in common with most of the networks on display, a comfortable, local setting will let them see that networks are something which are not only the domain of large organizations and companies.

Many of the experiences in this area will be simulated. Home shopping systems, video-on-demand, and interactive entertainment will be highlighted through hands-on interactions that will give visitors a taste of the kinds of home network systems being developed around the country.[29]

This area will also deal with telecommuters, a social change where a growing body of workers, liberated from their office through the computer and networks, do a majority of their work from home. Visitors will hear about the pluses and minuses associated with this arrangement; while it means less travel and more flexible hours, it also leads to less social interaction and greater distractions. *Would they want to telecommute?*

5) *Remote Connections*

Nothing will show the power of networks as well as two-way connections to the outside world. Set in an environment anchored by a large illuminated globe, this area will let visitors interact with people and information located all over the world. These connections will happen in four different ways:

i) *Remote video connections*: Full motion video connections to remote sites, including other museums[30], public spaces, and malls. This connection will be supplemented by a networked activity, such as a joint drawing activity.[31]

ii) *Bulletin boards/commercial network connections*: Access to the variety of information and forums available through different hobbyist bulletin board systems and commercial networks (CompuServe, America On-Line[32], ZiffNet, etc.). In each case, an easy to use front-end[33] will be developed to give visitors a feel for the kind of information each service has to offer. They will get a glimpse into the unique nature of discussions

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[28]It is in this section where the earlier-mentioned guideline about presenting science-fact, and not science-fiction, has significant weight. While there has been a great deal of speculation about the way the home will be transformed by networks, the Museum will document only those examples that, even if only in a limited scale, have been applied in the real world.

[29]All the systems will be directly based on actual test systems, such as Bellcore's model video demand system in Arlington, Virginia, or US West's interactive home shopping program in XXX.

[30]See items X in the Appendix: letters of interest by three museums around the country.

[31]See the description in section XX of *Person-to-Person*, a prototype project being developed for the exhibit.

[32]See item X in the Appendix: letter of interest from America On-Line.

[33]See the description in section XX of *CompuServe Front End*, a project developed to give uninitiated visitors an introduction to the CompuServe service.

people have in forums, and see the novel "communities" that have been formed as a result of network technology.

iii) *Internet connection:* An easy-to-use front end to Internet[34], where people can explore the vast amount of information (from discussions about beetles to Beatles lyrics) located on this massive network. Included will also be information about Internet; its history, how large it is estimated to be, and how people can become part of it.

iv) *Internet chat*: An opportunity for visitors to "chat" (through text) real-time with people on Internet.

It is in this area where the Museum's plans for national impact converge with visitor activities. As described in the exhibit objectives, the Internet connection will be two-way in order to provide a chat mode, as well as to "export" some of the exhibit's information (text, images, sounds, and select interactive software) to anyone who has access to a modem. This connection and information will be accessed in three ways: at a telnet/ftp (file transfer protocol) site located on a server at the Museum, through a bulletin board system, and via connections from commercial services.

This area also provides a good setting to have visitors face some of the social issues related to a world where up-to-the-second communications change the nature of time and space. For example, to give visitors a perspective of how far network technology has advanced in such a short time, there could be a description of life in the early part of the century by someone in their 80's. Just as they were asked at end of the film in the first part of the exhibit, visitors will be faced with the question of how much this technology has impacted their lives.

Other Application Areas

The five application areas described above highlight many of the issues that are planned for *The Networked Society*. Other potential application areas include:

- *Finance:* A view into S.W.I.F.T., the world-wide network for transferring funds among banks, and a visualization of how an ATM or Credit Card works.
- *Education:* A view into the Kids Network (described earlier)[35].
- *Government*: Visitors gain access to different government networks, and get to send a letter to their government representative.
- *Health Care*: A look at the way networks are used in the health care industry, from networked insurance forms to a remote analysis by specialists.
- *Airlines:* A view into SABR, the world-wide airplane reservation system, and a view into the FAA network for an up-to-the-minute picture of all the airplanes in the sky.

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[34]Beyond ease-of-use, there is the problem of limiting access to pornography. This problem is one of the reasons why Internet has not quickly become part of most learning environment. While the Museum believes in giving people as much access as possible to visitors, it has a responsibility to make sure the information they get is appropriate within the context of a museum environment.

[35]See item X in Appendix: letter of interest by TERC

Work Plan

The concept of *The Networked Society* exhibition has been in gestation for over a year. The Museum is now (August 1993) in a pre-planning/fundraising phase (25% funded), and plans to begin the planning phase in October 1993. As with its previous exhibitions, the Museum will focus much of its creative resources on this project so that it is developed at an ambitious pace and the concepts of the exhibition remain fresh, vibrant, and relevant from planning to implementation. As with all its past projects, the Museum has found that this strategy of intensive development has proven essential to developing high-quality, innovative and thought-provoking computer-based exhibitions.

Schedule[36]

Pre-planning Phase (Jan. - Sept. 1993)

- Develop broad concepts of exhibit
- Fundraising
- Begin preliminary tests of interactive concepts

Planning Phase (Oct. 1993 - Feb. 1994)

- Concept of exhibit set
- 3-D drawings set
- Further development of interactive concepts (Exhibit Lab opens in Oct. for evaluation)

Implementation Phase (March - Oct. 1994)

- Construction of space
- Development of 2-D components: exhibit text, graphics
- Development of interactive components (Evaluation continues)
- Development of educational activities (Visitor Assistant training) and materials
- Development of introductory film

Opening (Nov. 1994)

- Exhibit opens to public
- Summative evaluation (through Feb. 1995)

Evaluation

Evaluation has always played a critical role in the development of exhibits at the Museum. This process helps make sure a component of the exhibit communicates the intended educational message and, in the case of interactive software, allows the software development staff to test for reliability. For example, the *Exhibit Lab*, a testing ground for the *Tools & Toys* exhibit, was an informal setting where new programs were evaluated for two to three weeks. During this period, the evaluation staff observed how visitors used the programs, asked them what they liked and disliked, and questioned them about what they thought was the main message of the program.

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[36]See item X in the Appendix: a detailed timeline of the project

For *The Networked Society*, the Museum will re-open the *Exhibit Lab* in October 1993 (in a new location) to once again test all the components of the exhibit. Issues to be tested include the tracking "network society" part of the exhibit, and the activities associated with remote video links. Once the exhibit is in the Implementation Phase, the Museum will employ a full-time evaluator to oversee visitor reactions to the different components of the exhibit. This person will also oversee the summative evaluation that will take place once the exhibit has opened.

Advisory Boards
The Museum has found that a series of different Advisory Boards, each representing a different aspect of the exhibit, is the most efficient way to gain valuable feedback on the project. The Advisory Boards[37] planned for *The Networked Society* are:
• *Content/Fundraising Advisory Board*: Made up of scientists and business leaders in the field of networking, this group will oversee the networking issues and technology planned for the exhibit. They will also help in the fundraising process.
• *Humanities Advisory Board*[38]: Made up of academic specialists in the area of ethics and social issues, this Board will help develop and refine the humanities themes of the exhibit
• *Youth Advisory Board*: Made up of students from a Boston-city 6th grade class, this Board will help evaluate the text and interactive components of the exhibit to insure that the content appeals and is accessible to a broad audience.
• *Teacher Advisory Board*: Made up of teachers from the Boston school system, this Board will help evaluate the educational activities (especially the "network society" component) and educational materials of the exhibit.

Staffing
•Still to be completed
Manager/Overseer/PI's
Space Designer, assistant
Construction Manager
Construction Crew
Interactive Designers
Network specialist - especially for FTP site
Educator - Ed packet, Visitor Assistant Activity person, Text Writer - for FTP site
Other Museum Staff

Results from Prior NSF Support
•Still to be completed

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[37]See item X in Appendix: list of Advisory Boards members
[38]Support for the Humanities Advisory Board has be requested in a grant to the National Endowment for the Humanitites.

Appendix

Visual Materials

- Photos of Network Game, E-mail Pres, Person-to-Person, Compuserve Front End
- Example of Letter from President, information on other side about Internet.
- Example from Educational Packet

Other Materials

- Letter from film producer
- Letter from Apple On-Line
- Letters from Museums interested in remote connection
- Letter from TERC regarding Kids Network

The Mother of all Networks: The Telephone System

Every day Americans place over 1.7 *billion* telephone calls.* Yet how many people are aware that every time they order a pizza or call a friend, indeed every time they pick up the phone, they are using the world's largest, most complex system of computers? How many people truly understand how this system provides instant worldwide communication? Very few.

The telephone system is the most pervasive, but in some senses the most transparent, computerized network in existence. As part of *The Networked Society*, a major new exhibition focusing on such strategic uses of computers, The Computer Museum will reveal to the general pubic the vast system that makes possible this service we all take for granted. Through a series of computer-based interactive stations, a hallmark of the Museum, visitors will explore what goes on behind the scenes whenever they place a call, and by so doing, will gain a better aunderstanding of and ppreciation for the way telecommunications work, how they serve us, and how they will be used to shape the world of the future.

From Here to There

Just how does your call make its way from your phone to the phone at the Pizza Palace? Most people never give this a second thought, and if asked, would be at a loss to explain how a call is routed to its destination. To gain a basic understanding of how this works, an interactive computer animation will allow visitors to experiment with a simulation of the traditional electro-mechanical switch system in which the direct connection between the number dialed and the actual circuit established is immediately apparent. This will give visitors a basic notion of how the phone system deciphers a call and connects it to its destination. The interactive demonstration will continue by explaining that today's system is electronic, digital, and much more complex.

Avoiding Overloads and Coping with Crisis

Modern phone systems must flexibly handle an immense volume of traffic. The traditional direct connection model just described could not circumvent downed lines, nor re-route calls through less busy switches—this limited its capabilities. In a simulation of a network control center, visitors will use a series of computer interactives to see how modern computerized telephone switching systems adapt to changing conditions. Using a graphic simulation of network activity, visitors can gain a sense of the enormous volume of traffic during even normal operations. In a time-lapse sequence they can watch the changing pattern of use across the U.S. during the course of the day—at noon East Coast Time the level of transcontinental traffic jumps as the business day begins in California. Visitors can direct a blizzard toward the mid-West and watch as the network re-routes calls around the afflicted area. Pressing another button shows them the big picture on Mother's Day when the volume of traffic skyrockets and the network constantly shuffles calls to balance the load so that the network does not bog down and calls go through without a hitch. Never again will visitors take the call to grandma for granted.

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* Source: Statistical Abstract of the United States, 1991.

It's not just for your voice anymore

Of course, the telecommunications system is rapidly becoming the Information Age equivalent of the interstate highway system. While individual callers represent the family sedan, increasingly large volumes of business data are the electronic equivalents of 18 wheelers. Bank and credit card transactions, faxed documents, electronic messages and the like are part of the vast flow of vital information that keeps society running across phone lines. The Museum will give visitors a special "telecomscope" to peer into a typical phone line running under a city street. Much as doctors can watch individual blood cells course through blood vessels, visitors will be able to "watch" individual calls stream past through the line—there goes a credit card check to a computer in Kansas, a news report coming in from Switzerland, an x-ray on its way to a hospital in Boston. The message will be clear: the "phone" system carries much more than the sound of your voice.

New Transmission Media Carry More Information More Places

Once all calls traveled over copper cables. To even talk of phone "lines" in this age is somewhat misleading. Telecommunications actually employs a host of different carrier media. An ordinary long distance phone call may pass from copper wire, through fiberoptic cable, along microwaves, and bounce off a satellite, without the caller hearing a thing before it reaches its destination. A large animated map of the world will illustrate how the different media are integrated to provide global point-to-point communication. Near the map will be a presentation comparing the characteristics of the different carrier media; for example, visitors will select different signals (text, voice, image) to transmit over copper or fiberoptic cable. The capabilities of the different media will be obvious.

The Future of Staying in Touch

Today, by and large, the phone system only brings voice to the home. But soon, it may be the channel though which we increasingly experience and interact with the world in many different ways. Fiberoptic cable will permit much more information traffic than copper cable. We may soon "call" up the video store and receive a movie on our TV right over the phone line. The newspaper may no longer land on your doorstep, but instead be beamed to you electronically each morning. Our children will soon not only be able to tell distant relatives about the picture they drew in school, but show it to them electronically while they speak. The phone line will become an umbilical cord to the world of information, entertainment, and services. In a "house of the future" setting, visitors will explore the increased volume and variety of information the phone system will put at their finger tips as the functions of phones, computers, and TVs are integrated.

And if you are out and about instead of by the phone—no problem. Direct satellite cellular systems will enable you to carry your link to the electronic world wherever you go, and as you wander, the system will make sure you do not miss a single call.

MINUTES

Networked Society Fundraising Meeting, 1/13/93

Attending: Gardner Hendrie, Julie Oates, Oliver Strimpel, Greg Welch, Charlie Zraket

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The meeting was held to discuss the status of fundraising efforts for the Networked Society project and to determine steps to cultivate new prospects.

The following action items resulted from the discussion:

Greg and Julie
- Will add lists of sponsors of past exhibit projects to the exhibits photo book
- Develop a conceptual floor plan for TNS for photo book
- Will work on a splashy presentation of the Walk-Through
- meet w/ Nelson Bollan (sp?) of MITRE re: educational Internet station.

Oliver
- call Barry Horowitz (271-7382) re: sponsorship and Nelson Bollan's work
- call Ed Schwartz (695-3660) re: Charlie mentioning project to Bob Everett
- call Casimir Skrzypczak (914/287-5002) re: NYNEX sponsorship, let him know Charlie is approaching O'Brian.

Charlie
- call Saul Buxbaum (sp?) to discuss appropriate person to pitch at AT&T
- talk to Paul Stern re: Museum's efforts to get Roy Merrills to visit re: project
- talk to Paul O'Brian regarding NET vs. NYNEX sponsorship
- talk to Bob Everett re: DEC Participation (Nancy Dube, head of Comm. Rel.), after Oliver talks to Ed Schwartz
- chat w/ Richard Smith re: Clubhouse prop. to General Cinema Fnd. (Gloria Oldsman, contact)

Gardner
- call Paul Severino to arrange meeting re: contacts at MCI, Sprint, AT&T

FAX

TRANSMISSION
RECORD

The Computer Museum
TEL 617.426.2800
FAX 617.426.2943

Date: 1/14/93

To: Gardner Hendrie

From: Greg Welch Ext. 337

300 Congress Street
Boston, MA 02210

Number of pages (including cover sheet): 2

Notes: Minutes from yesterday's meeting.

TRANSMISSION REPORT AUG 07 '92 13:51

RECEIVER:

PAGES SENT: 08

DURATION: 05:09

Fundraising Status for The Networked Society as of 10/29/92

	Staff	Board	Company	Contact	phone	Next Step	Action Taken	Comments
			Tandem	Jim Treybig				- do ATM's direct competitor w/ Stratus
			Teleport			- McKenney call president		- supply major data link to NYC
			Thinking Machines					Do Dow Jones text retreival
			Thomas Cooke Travel					
			Toshiba					
			TRW					
			TV Answer	Richard R. Miller, COO				
2	OS		Unisys	David Curry	313/972-7835	approach in late 1993	- OS sent prop. v1.2 8/6/92,, Sitkin sent John Holton prop., 8/13, OS spoke Curry	- Unisys profitable again
			Verifone					Gardner knows?
	GW		Walmart			get annual report		Jim McKenney knows CIO - giving perochial
	OS		Wellfleet Communications	Paul Severino	617\123-3655			
	GW		Xerox	Seeley-Brown, Weiser, Bill Spencer, Wallington		JO set up meeting at Fnd., have GB follow up ltrs to S-B, talk to Pat Wallington 1/14	- sent prop.v1.3mod to Fnd. and request for endorse to S-B and Spencer fr. GB	Spener sent endorsement
1	GW		Ziff-Davis	Bill Machrone, Bill Ziff		GW meeting w/ Belove 1/13/93--send Cyberspace Exploration Center piece,		hook Terri Holbrooke up w/ Ziff--friends
	OS	Case	IBM	Parkel, Howard Funk, Armstrong, Case		OS visiting 11/11 - send Funk prop.	- Pollard indicated that want to particpate maybe next year	
		CZ	NYNEX	Paul O'Brien – Pres NET		- send proposals		- offer menu between Networked and Clubhouse--
	JO	CZ PS	AT&T	Susana Thompson, Jim Clarke, Lucky, Zeaman Sol Buchbaum		JOto call Zeaman	- OS sent Clark prop. 7/31	- need to strategize
	GW	GH	Chipcom	David Fowler		- GW follow up after 9/7 get copy of annual report	GW sent prop. v1.2 8/21/92	- Gardner invested there knows everyone--call? - "arch enemies" of Cabletron, Synoptics
1	OS	GH	Cisco	John Morgridge	415/326-1914	OS trying to set up appointment		Founders are from Data General have left company --Gardner knows them.--head on competition w/ Wellfleet,
1	OS	GH	Stratus	Bill Foster, John Goodwin	508/460-2000	GW called Goodwin l.m. 1/13	OS, GW met Goodwin 12/92	
		IS	Humana	Fred Pirman (sp?)				
		IS	MCI	Dick Liebhaber		- try to set up visit	Sitkin sent ltr w/ propv1.2 8/10/92 JW spoke "no $" but tryto set up mtng	IS knows Leibhaber
		JMc IS	Air Products	Pete Mather		- McKenney call - Sitkin knows Mather		- software for airlin reservation systemse
	GW	PS	Sprint	Ron Pounder		Mckenney speak to Cash	GW to follow up w/ fellow from brainstorming	- McKenney knows Jim Cash (HBS) on Sprint board

Fundraising Status for The Networked Society as of 10/29/92

	Staff	Board	Company	Contact	phone	Next Step	Action Taken	Comments
	GW		3Com	David Abramson, Bill Swift		get local people over to see game – get Benhamou over	- sent prop.v1.1 7/8/92 - OS visited Abramson in CA 7/13?/92	Abramson enthused-- - need to get game running well - then get local people by,
	GW		3M Telecom Systems	Cary Williamson @ Miller Communications	214/233-0956	-GW invite rep. to visit – submt prop.	- JO sent brief summary to Williamson 6/3/92	- do research on company -- via Ziffnet
	GB		AMD	Tony Rea				- pitch as "network chip provider" – Wellfleet big customer
	GB		Amdahl	Gene White		GB and OS meeting Lloyd Dickman, 11/3/92	- OS toured on 7/21	- CC prospects, do 800 numbers
	GW		American Airlines	Max Hopper, Karen Cook		)S follow up	OS spoke w/ Cook 11/30, sent Cook prop. w/ AA piece 12/18	Approached a long time ago. OS talked w/ 10/23?, just opened Mus. little SABRE, MH have to go PR for $
	DG		American Management	Greg Pellegrino			David sent prop. v1.2	
1	OS		Bank of Boston	Michael Simmons, Warren McFarrlen (sp?)	434-6464	- OS arrange meeting and send prop.	- McKenney spoke w/ McFarrlen	
	GW		Banyan	Dave Mahoney, Siobohan Cohen		GW l.m w/Carol 1/5, 1/13	- spoke w/ Mahoney @ breakfast, sent prop v1.3 11/6, S. Carol handling-interes	- compete w/ Novell- less directly now
	JO		Bellcore	George Hielmeier		- JO to call to speak at seminar		- GW to follow up w/ Davie
	GW		Bomara Associates	Glen Seaman	508/452-2299	GW follow up	- sent prop v1.2 8/25/92	- networking consultants group--Seaman can recommend vendors they work with we can approach
1	GB		Cabletron			-GB to call Glenda for info.		
	GB		Cadre Technologies, Inc.	Louis J. Mazzucchelli, Jr.	401/351-5950	- GB follow up	- OS met w/ WHEN?	- produce software team*work* used by Siemens to do automated toll road in Oslo.
	JO		Compuserve	Tibor Vais, Charlie Terry				- come to breakfasts
			Consolidated Freightways					- McKenney knows folks there? - networked trucking company
			CONVEX					- transaction processing - making $
	OS		Corporate Software, Inc.	Morton Rosenthal		OS follow up	- OS met w/ Rosenthal and Rotenburg 7/16, sent prop. v1.2 7/23	
1	OS		DARPA	Squires	703/696-2226	OS follow up--call Squires	- sent Squires prop. v 1.2 7/23/92, sent copy to Vint Cerf and tried to follow up	
2	OS		DEC	Nancy Dube	508/123-4567	shmooze Debbie--invite to open house	pitched as part of 3-year plan, send prop. v1.1 7/8/92	
			Dow-Jones					
			Dunn-Bradstreet					
			EDS	Jeff Heller				- IS knows Heller
			Equifax					
			Fidelity			- talk to Linda Bodman about getting contact thrugh Sam		
			Frito-Lay	Allen Deering (Pepsico)				IS knows Deering
			Fujitsu					
			GAP			- Mckenney call Jiro (sp?)		
	OS		GTE	Bill Griffin			OS sent prop. v1.2 8/14, invited to RSM opening	- GB and OS met w/ Griffin and Selfridge

Fundraising Status for The Networked Society as of 10/29/92

Staff	Board	Company	Contact	phone	Next Step	Action Taken	Comments
OS		Hewlett-Packard	Jim Bell		OS get in touch w/ Bell and ask for local advisor, Gary Eichorn–	- OS met w/ Bell 7/9/92, invited to be advisor-declined- offer some one else	
		Hitachi					
		Hughes	Michael Armstrong (CEO) Wayne Shleton (Div. Hd)				Has $1B contract fr om NASA for ? Headed by Armstron-former IBM
		Informix	Chuck House		- meet w/ House at board meeting		- informix does world-wide reservation system for Marriot
		M/A-COM					- do radio networking for Walmart
GW		Markle Foundation	Geller		- Greg to contact		- spoke at CPF-2
		Mead					
OS		Mitch Kapor	Mitch		GW to discuss CDC concept w/ EFF	sent proposal v1.2 8/7/92	get annual report
1 GB		NEC	Kobayashi		follow up?	OS has written Unohara per suggestion of Eric Bloch, GB wrote Kobayashi 9/3	cc: to local folks
GW		NEH	Tim Meagher, Fred Miller		re-visit in October	- Greg has spoken to sent prelim. proposals-	
GB		NetFrame	Enzo Torresi		- Gwen to meet or send proposal for $?	- Gwen saw at Shaeffer's conference-will give Netframe server	
		Nippon Telephone & Telegraph					
		Northern Telecom	Roy Merrills, Pres. Paul Stern, Chair.			- Sitkin spoke w/, trying to sched. visit, sent propv1.3 12/18	
GB	???	Novell	Terri Holbrooke, VP Corp Com, Martha Felt, Scott Ford	801/429-5829	send follow up materials	GW sent all prop v1.3 12/18, met Holbrooke and Ford 1/12	- next time in Boston
GW		NSF	Bob Russell, Barbara Butler		contact folks at CIS, GW call Bryant York (member)		- approach folks in Computer and Information Sciences Div.
		Pactel	Hancock		- McKenney call?		- McKenney knows Hancock
		Picturetel	Norman E. Gaut				
		Prodigy					
OS		Proteon	Patrick Cortin (pres.) Howard Salwan (chair.)		invite Salwen to RSM opening then in to visit		Salwan friend of the Museum for a long time. -GH: " not direct competitors w/ anyone really"
GW		QED	George Fosque	617/225-2510	- Greg call and send proposal	- OS met at opening	- make software for police and fire dispatching –too small for $$?
		RBOCs					
GW		Reuters			- Greg contact Jon Eklund to get name at Reuters		- on-line info provider- - Money 2000 exhibit at Info. Age
GW		Rockwell	James Sutter, Dana Abrams, Rich Byer		- GW call Abrams 310/797-1716 1/93	- OS spoke w/ Sutter— GW spoke Dana 12/21	
GW		S.W.I.F.T.	Peter Drummond, Jessica Kuborn		GW send proposal.	- Greg met w/ 5/11/92	- holding big annual conference here in 94
		Sears					
		Skypix	Howard M. Lefcowitz, Pres.				
OS		Society of Information	Pat Wallington (Xerox)		OS send prop.? chat up Wallington @ seminar	- Wallington giving talk at Museum	

The Networked Society

Executive Summary

Computerized networks span the globe. As we progress toward a more information-intensive society, this marriage between data processing and mass communications technologies will play an ever larger and more important role in our daily lives.

To enhance the public's appreciation of this technology and its impact on our world, The Computer Museum is creating a major new exhibition entitled *The Networked Society*. This exhibition will portray the strategic uses of networked computers upon which modern society depends and will feature applications in such areas as:

- Banking
- International Markets
- Travel Reservation Systems
- Communications Systems
- Manufacturing
- Utility Management
- Retail Management
- Education

In effect, the exhibit will be a microcosm of our society. By means of hands-on interactive displays, large-scale models, and multi-media presentations, the exhibition will take visitors right to the heart of the vital but invisible computerized networks that underlie our world. For instance, visitors will be able to explore what goes on "behind the scenes" when making travel arrangements on a real airline reservation system, get the "big picture" by monitoring telephone traffic in a simulation of a major network control center, observe how point-of-sales terminals provide retailers with up-to-the-minute information on inventory, and use an Automatic Teller Machine while hearing a real-time commentary on how a transaction is actually processed. Thus, as they interact with the exhibition, visitors will gain an understanding of how networks are integral to many of the activities that they take for granted. *The Networked Society* will provide the public with an overarching vision of the importance of networking technology, how it has been used to change our world, and the promise it holds for the future.

Advisors from industry and academia will guide the Museum in creating an exhibition and associated educational materials and outreach programs that have great public appeal and educational merit. Information within the exhibit will be presented at several levels of detail to accommodate the interests and backgrounds of a diverse audience. In addition to printed materials available in the gallery, further materials will be disseminated to schoolteachers and students nationwide. On-line information will further extend the reach of the project.

The total cost of developing *The Networked Society* project will be $2,482,500, comprising the donation of $1,425,000 worth of goods and services, and $1,057,500 to offset the cash cost of developing and constructing the exhibition. The Museum is seeking visionary corporations, foundations, and individuals to sponsor this unique and innovative educational project. Sponsors will receive significant recognition in the exhibition and all associated promotion and marketing efforts and materials. The exhibition is scheduled to open in mid-1994.

The Networked Society

Marketing and Promotion Plans

General Plan

The promotion of *The Networked Society* will be a multi-tiered program. In conjunction with the pro bono efforts of one of New England's top advertising agencies, *Leonard Monahan Lubars & Kelly*, The Computer Museum will develop a professional print and broadcast campaign for newspapers and magazines, TV and radio, and billboards. *LML&K* will be involved in both the creation of promotional materials and the implementation of the campaign. As it has done successfully in the past, the Museum will engage in cooperative promotional and marketing efforts with area hotels, tourist attractions, and convention facilities. Collateral materials and a retail merchandising program will also be developed. All efforts will be targeted to both trade and consumer market segments on a national level.

Sponsor Recognition

In addition to credits appearing in press releases, exhibit panels, posters, opening invitations, and other printed and electronic materials, sponsors of $25,000 or more will be included in a special series of promotional advertisements to be placed in industry and business publications prior to and following *The Networked Society's* opening in October 1994. The Museum will request full-page, four-color advertisements in leading industry, business and news publications to promote the new exhibition. The Museum has successfully solicited over $500,000 per year in free advertisements from over twenty publications, including:

- *Business Week*
- *Fortune*
- *Byte Magazine*
- *Computerworld*
- *MacWeek*
- *PC World*

The Museum's new galleries and exhibitions receive extensive international media coverage. For example, promotion of the Museum's landmark exhibition, *The Walk-Through Computer*™, made over 300 million media impressions worldwide. Since July 1, 1988 PR efforts for the Museum have resulted in over 828 million media impressions in 63 countries. Articles on the Museum have appeared in *The New York Times, The London Times, TASS, Der Spiegel, Life Magazine, USA Today, Popular Science, Newsweek, The Wall Street Journal*, the AP wire service, and many other publications. Electronic media coverage of the Museum has included reports by CNN, the Today Show, and National Public Radio.

As an exhibition treating a topic of great public interest and vital economic importance, *The Networked Society* is expected to result in exceptional worldwide electronic and print coverage. This will provide unusual visibility for the exhibition's sponsors and, in turn, attract large numbers of visitors to the exhibition.

The Networked Society

Sponsorship Opportunities

The Networked Society provides a unique opportunity for corporate and individual sponsors to be associated with a highly visible exhibition about how computerized networks affect our world. Not only will sponsors be part of a unique and important public education project, they will help people from all walks of life discover the importance of networking technology, how it has changed our world, and the promise it holds for the future. Benefits and privileges are designed to ensure that all sponsors and donors receive appropriate levels of recognition.

Principal Sponsors ($250,000 and up)

Principal Sponsors will receive prominent acknowledgement in all published materials and communications regarding the exhibit including the ad campaign (see "Marketing and Promotion Plans"), press releases, posters, gallery leaflets, Museum publications, and educational materials for school groups and on the screen of on-line resources and activities. Sponsors in this category will lead the list of supporters on credit panels placed prominently in the exhibition and will be granted rent-free use of the entire Museum for a function, an open house with 50% discount on admission to all employees and their family members with discounts in the Museum Store, and 100 tickets to the exhibit opening.

Major Sponsors ($100,000 to $249,000)

Prominent acknowledgement in all published materials and communications regarding the exhibit, including the ad campaign, press releases, posters, gallery leaflets, Museum publications, and educational materials for school groups and on the screen of on-line resources and activities. Sponsors in this category will follow Principal Sponsors on the list of supporters on credit panels placed prominently in the exhibition and will be granted rent-free use of the entire Museum for a function, an open house with 25% discount on admission to all employees and their family members with discounts in the Museum Store, and 50 tickets to the exhibit opening.

Sponsor ($50,000 to $99,000)

These sponsors will be acknowledged in exhibit publications and advertisements; their names will follow those of the Major Sponsors on the gallery credit panels. These sponsors will be entitled to an open house with 25% discount on admission and Museum Store discounts for all employees and their family members, and 15 tickets to the exhibit opening.

Donor ($25,000 to $49,000)

These sponsors will be acknowledged in publications and advertisements associated with the exhibit, but not in all press releases, and their names will follow those of the Sponsors on the gallery credit panels. Donors will receive 10 tickets to the exhibit opening.

Contributor ($10,000 to $24,000)

These sponsors will be acknowledged in exhibition advertisements, and on the sponsor panel in the exhibition itself. Contributors will receive 5 tickets to the opening.

In-kind Support

Supporters providing in-kind donations of equipment or services will be acknowledged on a separate credit panel displayed in the exhibition gallery, in accordance with the significance of the contribution.

All sponsors and contributors of in-kind support will also be listed in The Computer Museum newsletter and Annual Report, sent to the Museum's members and friends.

The Cyberspace Discovery Center: A Whole World of Information at Your Fingertips

Introduction

The Computer Museum proposes to create a center where visitors, with staff assistance, will actively experiement with and explore the vast resources and fundamental tools accessible through commercial and public computer networks and on-line information services. The goal of the project is to inspire people with the motivation, confidence and spirit of adventure to explore and make use of the world of information that networked computers place at their fingertips.

The need for such a center

Today it is increasingly clear that we stand on the verge of a movement which will have a profound effect upon how we as individuals and as a society work, play, and interact: the proliferation of computer networks. Low-cost, easy-to-use links will transform the computer into our primary means of interacting with an ever expanding universe of information. Every day more people have access to and make use of this technology. Every day more information and more services become available on-line. In tomorrow's world, the ability to use information networks will be even more critical than the ability to use a library is in the world of today.

Whereas, in the past, use of networks was limited by access and utility, today, with these impediments rapidly eroding, use of networks is limited largely by people's appreciation for how networks can be of use to them. Provide people with insights into how using a network is relevant to their work and interests, and they will be motivated to overcome whatever technical hurdles may stand in their way.

Most introductory books to using the Internet focus on the technical aspects of *how to* use the system, and provide much less insight into *why* one would want to use "the net" or *for what.* Presumably the purchaser of the book already has some motivation for getting "on-line." The Cyberspace Exploration Center will start by first providing visitors with that motivation.

What visitors will do?

Through intuitive introductory software and staff assistance, visitors will vault over many of the technical difficulties associated with accessing networks and data services to gain a sense of "what's out there." For example, to convey the notion of "traveling" through the net by calling one computer from another, visitors use a computer program that will allow them to take a spin around the globe by leap-frogging from one machine to the next. A map on the screen displays their progress.[1]

Another computer will then introduce visitors to the notion that the fundamental purpose of all these interconnected computers is that it permits people to exchange information. No utility illustrates this better than a newsgroup (electronic bulletin board). Visitors will be asked to select a topic. The computer will then search for a suitable newsgroup and allow visitors to peruse the latest postings.

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[1]This program would probably be a simple Hypercard front-end making use of the gopher utility.

The program will then allow visitors to scan a list of the thousands of newsgroups and will explain how a newsgroup functions and etiquette for getting involved in one.

A third program will enquire if there is a topic about which the visitors would like information; if not, it will suggest a topic. Explaining that, like in a library, computers have indexes that can be searched, the computer will conduct a WAIS search for the specified topic and display the results of its search. For the interested visitor the program will provide a more thorough tutorial on how to use such search utilities as ARCHIE, WAIS, GOPHER, and WWW. One of the key messages of this section of the exhibition is that, as with our pioneer ancestors, perseverance pays off for people exploring the information frontiers of the net.

In a computerized version of the Whole Internet Catalog, visitors will be free to browse through the system and various resources simply by pointing and clicking. Visitors will also be given the opportunity to explore the information made available by various commercial services such as ZiffNet, Dow Jones Information Service, Compuserve, Prodigy, etc. As with the other interactive stations, simplified front ends will help visitors surmount their inexperience with the services to quickly get some notion of the information and services they offer.

Once visitors have had an opportunity to explore the kinds of information networks can place in their grasp and to discover some of the basic utilities for accessing and making use of that information, they can investigate how to get "on line" themselves.

The Center will also maintain a fully-function server and make available on-line resources to assist people in making use of the Internet, including some of the software available in the exhibition and a moderated newsgroup about using the services and utilities available. In a sense, this might allow a class in California to "visit" the Center on-line.

Who will use the Center?

While the Center will be open to the general public, the needs of students will be a priority. For most of the Museum's open hours, families, professionals, tourists, students, and other Museum visitors will be free to drop in and use the Center at their leisure. However, during specified morning hours during the week, school classes will be able to schedule 1-hour visits for their exclusive use, allowing the Center staff to focus on their needs. Materials distributed to teachers ahead of time will help their classes get the most from their visit.[2]

Who will staff the Center?

The Center will require a full-time Coordinator and a part-time system administrator, but will depend largely upon the efforts of volunteers. The Coordinator will be responsible for training and scheduling volunteers to work with visitors and school groups. Volunteers will be selected less for their expertise on the Internet than their ability to work with the public and inspire a sense of adventure and the confidence to experiment and persevere that are so critical to making valuable use of on-line services.

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[2]The Museum staff will work with local educators to integrate the Cyberspace experience with school curricula, such as learning to write a research paper.

What will be required to build the center?

The most challenging aspect of creating the Center will be to design and implement interactive software that helps visitors easily explore on-line information and utilities. Creating such software is the Museum's forté. The Museum will also need to solicit the donation of computers and services necessary to run the software and link to the Internet.

The Center as a national model

Once the Center has been opened, tested, and refined it will serve as a model for creating similar centers around the country. Indeed the software developed by the Museum could be made available at moderate cost to other Museums and educational institutions to re-construct Cyberspace Discovery Centers to serve their local audiences.

The Computer Museum

300 Congress Street
Boston, MA 02210
(617) 426-2800

November 13, 1992

Gardner Hendrie
Sigma Partners
300 Commerical Street
Boston, MA 02109

Dear Gardner,

Here is the revised *Network Society* proposal. Your comments at our session after the last Board meeting inspired me to add some new elements which I hope have captured the excitement of the topic. I look forward to your feedback.

Julie and I are working to pull together a host of sales materials for the project, and I am drafting a description of a display which will directly appeal to the communications companies. As soon as we have these complete, I'll pass them along.

Regards,

Greg

Gregory W. Welch
Director of Exhibits

enclosures

The Networked Society

Executive Summary

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- Travel Reservation Systems
- Communications Systems
- Manufacturing
- Utility Management
- Retail Management
- Education

In effect, the exhibit will be a microcosm of our society. By means of hands-on interactive displays, large-scale models, and multi-media presentations, the exhibition will take visitors right to the heart of the vital but invisible computerized networks that underlie our world. For instance, visitors will be able to explore what goes on "behind the scenes" when making travel arrangements on a real airline reservation system, get the "big picture" by monitoring telephone traffic in a simulation of a major network control center, observe how point-of-sales terminals provide retailers with up-to-the-minute information on inventory, and use an Automatic Teller Machine while hearing a real-time commentary on how a transaction is actually processed. Thus, as they interact with the exhibition, visitors will gain an understanding of how networks are integral to many of the activities that they take for granted. *The Networked Society* will provide the public with an overarching vision of the importance of networking technology, how it has changed our world, and the promise it holds for the future.

Advisors from industry and academia will guide the Museum in creating an exhibition and associated educational materials and outreach programs that have great public appeal and educational merit. Information within the exhibit will be presented at several levels of detail to accommodate the interests and backgrounds of a diverse audience. In addition to printed materials available in the gallery, further materials will be disseminated to schoolteachers and students nationwide. On-line information will further extend the reach of the project.

The total cost of developing *The Networked Society* project will be $2,482,500, comprising the donation of $1,425,000 worth of goods and services, and $1,057,500 to offset the cash cost of developing and constructing the exhibition. The Museum is seeking visionary corporations, foundations, and individuals to sponsor this unique and innovative educational project. Sponsors will receive significant recognition in the exhibition and all associated promotion and marketing efforts and materials. The exhibition is scheduled to open in October 1994.

The Computer Museum

300 Congress Street
Boston, MA 02210

FAX

TRANSMISSION
RECORD

Date: 8.7.92

To: Gardner Hendrie

From: Greg Welch Ext. 337

TEL 617. 426. 2800
FAX 617. 426. 2943

Number of pages (including cover sheet): 8

Notes:

August 7, 1992

Gardner,

Here are the minutes and updated status reports from our meeting last week, and a draft of letter for the Board brainstorming session. I will send these via snail mail as well, as some may not fax well.

Let me know how you want to proceed.

I will send a proposal to David Fowler at Chipcom. Any chance you go put in a word of encouragement for us at the top?

Talk to you soon.

Greg

Minutes from Networked Society Fundraising Meeting 7/30/92

In attendance: Gardner Hendrie, Oliver Strimpel, Greg Welch

Gardner, Oliver, and Greg met to discuss fundraising efforts an potential prospects for The Networked Society exhibition. Much of the discussion focussed upon the prospects listed on the Fundraising Status Report and the Funding Matrix diagram and has been incorporated into those documents (attached). A few new prospects were added, including Reuters and Rockwell International. It was agreed that the Reuters Money 2000 exhibit on display at the Smithsonian was be worthwhile including in the exhibition and should be pursued by Greg. Additional manufacturing applications should be explored.

Gardner made the following points:

- A $25K lead gift from Wellfleet was unrealistic.

- We should meet with Mike Simmons of Bank of Boston.

- Naomi Seligman would be the best person to approach Max Hopper at American Airlines.

- Linda Bodman could speak to Sam Bodman about a contact at Fidelity.

- We should set up a fundraising brainstorming session after the forthcoming board meeting (Oct. 9, at 12:45pm). Gardner would send letters to the following board members inviting them to attend:

    - Naomi Seligman
    - Max Hopper
    - James Sutter
    - Dick Case
    - Charlie Zracket
    - James Clark
    - Bob Lucky
    - Chuck House
    - Irv Sitkin
    - Paul Severino

(Should James McKenney be included?)

Greg agreed to draft a letter for Gardner and support him in pulling together this group on October 9.

Dear [Charlie],

Planning for The Networked Society, an exhibition focusing on large-scale strategic business uses of computers, is now in full swing. As you know, this ambitious exhibit will be the finale to the five-year exhibit plan adopted by the Board in 1989. The latest project description developed by the staff is enclosed.

To bring this exciting project to fruition, the Museum will have to do quite a bit of networking in the network user and supplier communities. To jump start this process, I am convening a brief brainstorming session following the next board meeting at 12:45 on October 9. We will be discussing people's ideas for the exhibition and picking their brains for contacts in the networking world whom we could approach to support this project. I hope you will join the meeting and share with us your experience and perspectives in this area.

Thank you.

Regards,

Gardner C. Hendrie

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	MCI						
	NYNEX			- send proposals		- offer menu between Networked and Clubhouse--	
	EDS						
	CONVEX					- transaction processing - making $	
	M/A-COM					- do radio networking for Walmart	
	Tandem	Jim Treybig				- do ATM's direct competitor w/ Stratus	
	Frito-Lay					-- McKenney know anyone here?-- not anymore they've left	
	Dow-Jones						
	Thinking Machines					Do Dow Jones text retreival	
	Mead						
	Dunn-Bradstreet						
	Prodigy						
	Sears						
	Toshiba						
	Fujitsu						
	Nippon Telephone & Telegraph						
	Hitachi						
	Verifone					Gardner knows?	
	Pactel	Hancock		- McKenney call?		- McKenney knows Hancock	
	Consolidated Freightways					- McKenney knows folks there? - networked trucking company	
	Teleport			- McKenney call president		- supply major data link to NYC	
	Air Products	Pete Mather (sp?)		- McKenney call		- software for airlin reservation systemse	
	Rockwell	James Sutter		- GH invte to meet aftr board meeting			
	Fidelity			- talk to Linda Bodman about getting contact thrugh Sam			
	Informix	Chuck House		- meet w/ House at board meeting		- informix does world-wide reservation system for Marriot	
	GAP			- Mckenney call Jiro (sp?)			

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GB	Xerox	Seeley-Brown, Weiser		GB meet w/ Weiser -- get to see Seeley-Brown	- GB met w/ Weiser - he will discuss w/ Brown		
GB	Cabletron			-GB to call Glenda for info.			
GB	Amdahl	Gene White		send prop?-- GB to write Lloyd Dickman	- OS toured on 7/21	- CC prospects	
GB	Cadre Technologies, Inc.	Louis J. Mazzucchelli, Jr.	401/351-5950	- GB follow up	- OS met w/ WHEN?	- produce software team*work* used by Siemens to do automated	
GB	NetFrame	Enzo Torresi		- Gwen to meet or send proposal for $?	- Gwen saw at Shaeffer's conference-will give Netframe server		
GB	AMD	Tony Rea				- pitch as "network chip provider" -- Wellfleet big customer	
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G W	Sprint			Mckenney speak to Cash	GW to follow up w/ fellow from brainstorming	- McKenney knows Jim Cash (HBS) on Sprint board	
G W	American Airlines	Max Hopper		GH inviteHopper to session after Board meeting--talk to Naomi about		Approached a long time ago. - Ask Hopper to host	
G W	Chipcom	David Fowler		get copy of annual report	GW to call and send prop.	- Gardner invested there knows everyone--call?	
G W	QED	George Fosque	617/225-2510	- Greg call and send proposal	- OS met at opening	- make software for police and fire dispatching	
G W	3M Telecom Systems	Cary Williamson @ Miller Communications	214/233-0956	-GW invite rep. to visit -- submt prop.	- JO sent brief summary to Williamson 6/3/92	- do research on company -- via Ziffnet	
GW	Walmart			get annual report		Jim McKenney knows CIO - giving perochial	
G W	S.W.I.F.T.	Peter Drummond, Jessica Kuborn		GW send proposal.	- Greg met w/ 5/11/92	- holding big annual conference here in 94	
G W	Reuters			- Greg contact Jon Eklund to get name at Reuters		- on-line info provider- - Money 2000 exhibit at Info. Age	
G W	NSF	Bob Russell, Barbara Butler		contact folks at CIS		- approach folks in Computer and Information Sciences Div.	
G W	NEH	Tim Meagher, Fred Miller		re-visit in October	- Greg has spoken to sent prelim. proposals-		
G W	Markle Foundation	Geller		- Greg to contact		- spoke at CPF-2	
JO	AT&T	Susana Thompson, Jim Clarke, Lucky, Zeaman		JOto call Zeaman	- OS sent Clark prop. 7/31	- need to strategize	
JO	Banyan	Dave Mahoney		send prop? chat up at seminar	- JO set up talk Oct. 27.	- compete w/ Novell	
JO	Bellcore	George Hielmeier		- JO to call to speak at seminar		- GW to follow up w/ Davie	
JO	Compuserve	Tibor Vais, Charlie Terry				- come to breakfasts	
OS	DEC	Nancy Dube	508/123-4567	shmooze Debbie--invite to open house	pitched as part of 3-year plan, send prop. v1.1 7/8/92		
OS	Wellfleet Communications	Paul Severino	2617\123-3655	send prop.?, ask for $25K up front for planning--won't then go to Cisco	hosted w/ 5/17 brainstorming session	- after brainstorming we'll share our strategy w/ Paul	50,000
OS	IBM	Parkel, Howard Funk, Armstrong, Case		- wait to hear	- Pollard indicated that want to particpate maybe next year		

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OS	Proteon	Patrick Cortin (pres.) Howard Salwan (chair.)		Geri to get Salwen in for visit		Salwan friend of the Museum for a long time.	
OS	Hewlett-Packard	Jim Bell		OS get in touch w/ Bell and ask for local advisor, Gary Eichorn--	- OS met w/ Bell 7/9/92, invited to be advisor-declined- offer some one else		
OS	Unisys	David Curry		OS follow up late Aug.	- OS sent prop. v1.2 8/6/92 - GB saw Curry	- Unisys profitable again	
OS	DARPA	Squires		OS follow up-- send copy to Vint Cerf	- sent Squires prop. v 1.2 7/23/92		
OS	Bank of Boston	Michael Simmons, Warren McFarrlen (sp?)		- OS send prop.	- McKenney spoke w/ McFarrlen		
OS	Corporate Software, Inc.`	Morton Rosenthal		OS follow up	- OS met w/ Rosenthal and Rotenburg 7/16, sent prop. v1.2 7/23		
OS	Mitch Kapor	Mitch		send proposal		get annual report	
OS	GTE	Bill Griffin		OS/GB send prop.--set up further meeting		- GB and OS met w/ Griffin and Selfridge	
OS	Society of Information Management	Pat Wallington		OS send prop.? chat up Wallington @ seminar	- Wallington giving talk at Museum		

APPLICATION AREA

	Banking/Finance/ Markets	Travel/Transport	Retail	Communications	Information Utilities	Manufacturing	Utilities/Control	Services	Government/Law
GLOBAL	S.W.I.F.T (Unisys)	***Airlines*** American Airlines, SABRE (IBM, Air Products) United, Delta Consortium		***Phone*** AT&T Sprint MCI GTE ***Internet*** NSF DARPA Teleport	Reuters		***Air Traffic Control*** FAA (Fu Assoc.) (Dave Nelson)		
NATIONAL	Cirrus ***Credit Card*** Visa, Mastercard, Amex (Verifone) Credit Checks	***Shipping*** Fed Ex Consolidated Freightways UPS Union Pacific	Walmart (MA/-COM) Waban (sp?) (IBM) Gap	RBOCs Pactel ***Research***	Dun&Bradstreet Dow-Jones (Thinking Machines) Mead ZiffNet Compuserve Prodigy	Navistar Chrysler GM (EDS, IBM)	***Electricity*** Boston/Edison	remote diagnonsis ***Health Care*** Humana HCHP	FBI (NEC, NCR?)
REGIONAL	Ariz. Stock Exch.		***Food*** Frito-Lay Taco Bell					***Office Network*** (Novell,	
LOCAL	Bank of Boston (Stratus?)	Thomas Cooke Travel	McDonald's ***Groceries*** Stop & Shop Purity Supreme (NCR, IBM)		Seniornet		***Traffic Control*** Subway/train control Stop light (NYC?, Tokyo?) (Media Lab map of NYC)		

Mtg. 10/12
agreed to Telephone proposal
by GW
then CZ & Paul Severino talk
about strategy to sell

APPLICATION AREA

	Banking/Finance/ Markets	Travel/Transport	Retail	Communications	Information Utilities	Manufacturing	Utilities/Control	Services	Government/Law
GLOBAL	S.W.I.F.T (Unisys)	***Airlines*** American Airlines, SABRE (IBM, Air Products) United, Delta Consortium		***Phone*** AT&T Sprint MCI GTE ***Internet*** NSF DARPA Teleport	Reuters		***Air Traffic Control*** FAA (Fu Assoc.) (Dave Nelson)		
NATIONAL	Cirrus ***Credit Card*** Visa, Mastercard, Amex (Verifone)	***Shipping*** Fed Ex Consolidated Freightways UPS	Walmart (MA/-COM) Waban (sp?) (IBM)	RBOCs Pactel	Dun&Bradstreet Dow-Jones (Thinking Machines) Mead	Navistar Chrysler		remote diagnonsis ***Health Care*** Humana HCHP	FBI (NEC, NCR?)
REGIONAL	Credit Checks Ariz. Stock Exch.	Union Pacific	Gap ***Food*** Frito-Lay	***Research***	ZiffNet Compuserve	GM (EDS, IBM)	***Electricity*** Boston/Edison	***Office Network*** (Novell,	
LOCAL	Bank of Boston (Stratus?)	Thomas Cooke Travel	Taco Bell McDonald's ***Groceries*** Stop & Shop Purity Supreme (NCR, IBM)		Prodigy Seniornet		***Traffic Control*** Subway/train control Stop light (NYC?, Tokyo?) (Media Lab map of NYC)		

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3Com	David Abramson		get local people over to see game -- get Benhamou over	- sent prop.v1.1 7/8/92 - OS visited Abramson in CA 7/13?/92	Abramson enthused-- - need to get game running well -	
3M Telecom Systems	Cary Williamson @ Miller Communications	214/233-0956	-GW invite rep. to visit -- submt prop.	- JO sent brief summary to Williamson 6/3/92	- do research on company -- via Ziffnet	
Air Products	Pete Mathieson (sp?)		- McKenney call		- software for airlin reservation systemse	
AMD	Tony Rea				- pitch as "network chip provider" -- Wellfleet big customer	
Amdahl	Gene White		send prop?-- GB to write Lloyd Dickman	- OS toured on 7/21	- CC prospects	
American Airlines	Max Hopper		GH inviteHopper to session after Board meeting--talk to Naomi about		Approached a long time ago. - Ask Hopper to host	
American Management Systems, Inc.	Greg Pellegrino			David dent prop. v1.2		
AT&T	Susana Thompson, Jim Clarke, Lucky, Zeaman		JOto call Zeaman	- OS sent Clark prop. 7/31	- need to strategize	
Bank of Boston	Michael Simmons, Warren McFarrlen (sp?)		- OS send prop.	- McKenney spoke w/ McFarrlen		
Banyan	Dave Mahoney		send prop? chat up at seminar	- JO set up talk Oct. 27.	- compete w/ Novell	
Bellcore	George Hielmeier		- JO to call to speak at seminar		- GW to follow up w/ Davie	
Bomara Associates	Glen Seaman	508/452-2299	GW follow up	- sent prop v1.2 8/25/92	- networking consultants group--Seaman can recommend	
Cabletron			-GB to call Glenda for info.			
Cadre Technologies, Inc.	Louis J. Mazzucchelli, Jr.	401/351-5950	- GB follow up	- OS met w/ WHEN?	- produce software team*work* used by Siemens to do automated	
Chipcom	David Fowler		- GW follow up after 9/7 get copy of annual report	GW sent prop. v1.2 8/21/92	- Gardner invested there knows everyone--call?	
Cisco	John Morgridge				Founders are from ~~Data General~~ Stanford Univ have left company--Gardner	
Compuserve	Tibor Vais, Charlie Terry				- come to breakfasts	
Consolidated Freightways					- McKenney knows folks there? - networked trucking company	
CONVEX					- transaction processing - making $	
Corporate Software, Inc.`	Morton Rosenthal		OS follow up	- OS met w/ Rosenthal and Rotenburg 7/16, sent prop. v1.2 7/23		
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Dow-Jones						
Dunn-Bradstreet						
EDS						
Fidelity			- talk to Linda Bodman about getting contact thrugh Sam			
Frito-Lay					-- McKenney know anyone here?-- not anymore they've left	

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Fujitsu						
GAP			- Mckenney call Jiro (sp?)			
GTE	Bill Griffin		OS--set up further meeting	OS sent prop. v1.2 8/14	- GB and OS met w/ Griffin and Selfridge	
Hewlett-Packard	Jim Bell		OS get in touch w/ Bell and ask for local advisor, Gary Eichorn--	- OS met w/ Bell 7/9/92, invited to be advisor-declined- offer some one else		
Hitachi						
IBM	Parkel, Howard Funk, Armstrong, Case		- wait to hear	- Pollard indicated that want to particpate maybe next year		
Informix	Chuck House		- meet w/ House at board meeting		- informix does world-wide reservation system for Marriot	
M/A-COM					- do radio networking for Walmart	
Markle Foundation	Geller		- Greg to contact		- spoke at CPF-2	
MCI						
Mead						
Mitch Kapor	Mitch		sent proposal v1.2 8/7/92		get annual report	
NEC	Kobayashi			OS has written Unohara per suggestion of Eric Bloch, GB wrote Kobayashi 9/3	cc: to local folks	
NEH	Tim Meagher, Fred Miller		re-visit in October	- Greg has spoken to sent prelim. proposals-		
NetFrame	Enzo Torresi		- Gwen to meet or send proposal for $?	- Gwen saw at Shaeffer's conference-will give Netframe server		
Nippon Telephone & Telegraph						
Northern Telecom	Roy Merrills			- Sitkin arranged Merrills visiting on 10.21		
Novell	Bills		GB to send proposal	met here at Museum functions	- next time in Boston	
NSF	Bob Russell, Barbara Butler		contact folks at CIS		- approach folks in Computer and Information Sciences Div.	
NYNEX			- send proposals		- offer menu between Networked and Clubhouse--	
Pactel	Hancock		- McKenney call?		- McKenney knows Hancock	
Prodigy						
Proteon	Patrick Cortin (pres.) Howard Salwan (chair.)		Geri to get Salwen in for visit		Salwan friend of the Museum for a long time.	
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Reuters			- Greg contact Jon Eklund to get name at Reuters		- on-line info provider- - Money 2000 exhibit at Info. Age	
Rockwell	James Sutter		- GH invte to meet aftr board meeting			
S.W.I.F.T.	Peter Drummond, Jessica Kuborn		GW send proposal.	- Greg met w/ 5/11/92	- holding big annual conference here in 94	

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Sears						
Society of Information Management	Pat Wallington		OS send prop.? chat up Wallington @ seminar	- Wallington giving talk at Museum		
Sprint	Ron Conder (IS)		Mckenney speak to Cash	GW to follow up w/ fellow from brainstorming	- McKenney knows Jim Cash (HBS) on Sprint board	
Stratus	Foster, Bill		follow up -- Hendrie to call Foster	OS sent Foster prop 1.1 7/10/92, copy to Hendrie	old history-needs to be warmed up	
Tandem	Jim Treybig				- do ATM's direct competitor w/ Stratus	
Teleport			- McKenney call president		- supply major data link to NYC	
Thinking Machines					Do Dow Jones text retreival	
Toshiba						
Unisys	David Curry		Curry to try to arrange visit w/ Jim Unruh	- OS sent prop. v1.2 8/6/92,, Sitkin sent John Holton prop., 8/13	- Unisys profitable again	
Verifone					Gardner knows?	
Walmart			get annual report		Jim McKenney knows CIO - giving perochial	
Wellfleet Communications	Paul Severino	2617\123-3655	send prop.?, ask for $25K up front for planning--won't then go to Cisco	hosted w/ 5/17 brainstorming session	- after brainstorming we'll share our strategy w/ Paul	50,000
Xerox	Seeley-Brown, Weiser		GB meet w/ Weiser -- get to see Seeley-Brown	- GB met w/ Weiser - he will discuss w/ Brown		
Ziff-Davis	Bill Machrone		GB to call to invite to visit			

K-Mart David Carlson

talk to Greg & Oliver

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JO	Banyan	Dave Maboney		send prop? chat up at seminar	- JO set up talk Oct. 27.	- compete w/ Novell	
JO	Bellcore	George Hielmeier		- JO to call to speak at seminar		- GW to follow up w/ Davie	
JO	Compuserve	Tibor Vais, Charlie Terry				- come to breakfasts	
OS	DEC	Nancy Dube	508/123-4567	shmooze Debbie--invite to open house	pitched as part of 3-year plan, send prop. v1.1 7/8/92		
OS	Wellfleet Communications	Paul Severino	2617\123-3665	send prop.?, ask for $25K up front for planning--won't then go to Cisco	hosted w/ 5/17 brainstorming session	- after brainstorming we'll share our strategy w/ Paul	50,000
OS	IBM	Parkel, Howard Funk, Armstrong, Case		- wait to hear	- Pollard indicated that want to participate maybe next year		

Fundraising Status for The Networked Society as of 8/6/92

Resp.	Company	Contact	phone	Next Step	Action Taken	Comments	Request
OS	Stratus	Foster, Bill		follow up -- Hendrie to call Foster	OS sent Foster prop 1.1 7/10/92, copy to Hendrie	old history-needs to be warmed up	
OS	Proteon	Patrick Corbin (pres.) Howard Salwan (chair.)		Ceri to get Salwen in for visit		Salwan friend of the Museum for a long time.	
OS	Hewlett-Packard	Jim Bell		OS get in touch w/ Bell and ask for local advisor, Gary Eichorn--	- OS met w/ Bell 7/9/92, invited to be advisor-declined- offer some one else		
OS	Unisys	David Curry		OS follow up late Aug.	- OS sent prop. v1.2 8/6/92 - GB saw Curry	- Unisys profitable again	
OS	DARPA	Squires		OS follow up-- send copy to Vint Cerf	- sent Squires prop. v 1.2 7/23/92		
OS	Bank of Boston	Michael Simmons, Warren McFarrlen (sp?)		- OS send prop.	- McKenney spoke w/ McFarrlen		
OS	Corporate Software, Inc.`	Morton Rosenthal		OS follow up	- OS met w/ Rosenthal and Rotenburg 7/16, sent prop. v1.2 7/23		
OS	Mitch Kapor	Mitch		send proposal		get annual report	
OS	GTE	Bill Griffin		OS/GB send prop.--set up further meeting		- GB and OS met w/ Griffin and Selfridge	
OS	Society of Information Management	Pat Wallington		OS send prop.? chat up Wallington @ seminar	- Wallington giving talk at Museum		

APPLICATION AREA

	Banking/Finance/ Markets	Travel/Transport	Retail	Communications	Information Utilities	Manufacturing	Utilities/Control	Services	Government/Law
GLOBAL	S.W.I.F.T (Unisys)	***Airlines*** American Airlines, SABRE (IBM, Air Products) United, Delta Consortium		***Phone*** AT&T Sprint MCI GTE ***Internet*** NSF DARPA	Reuters		***Air Traffic Control*** FAA (Fu Assoc.) (Dave Nelson)		
NATIONAL	Cirrus ***Credit Card*** Visa, Mastercard, Amex (Verifone) Credit Checks	***Shipping*** Fed Ex Consolidated Freightways UPS Union Pacific	Walmart (MA/-COM) Waban (sp?) (IBM) Gap	Teleport RBOCs Pactel ***Research***	Dun&Bradstreet Dow-Jones (Thinking Machines) Mead ZiffNet	Navistar Chrysler GM (EDS, IBM)	***Electricity*** Boston/Edison	remote diagnonsis ***Health Care*** Humana HCHP	FBI (NEC, NCR?)
REGIONAL	Ariz. Stock Exch.		***Food*** Frito-Lay Taco Bell		Compuserve Prodigy			***Office Network*** (Novell,	
LOCAL	Bank of Boston (Stratus?)	Thomas Cooke Travel	McDonald's ***Groceries*** Stop & Shop Purity Supreme (NCR, IBM)		Seniornet		***Traffic Control*** Subway/train control Stop light (NYC?, Tokyo?) (Media Lab map of NYC)		

August 7, 1992

Gardner,

Here are the minutes and updated status reports from our meeting last week, and a draft of letter for the Board brainstorming session. I will send these via snail mail as well, as some may not fax well.

Let me know how you want to proceed.

I will send a proposal to David Fowler at Chipcom. Any chance you go put in a word of encouragement for us at the top?

Talk to you soon.

Greg

Minutes: Brainstorming Session for the exhibit *The Networked Society*.
March 30, 1992, 3:30-5:30
Corporation for National Research Initiatives., Reston, VA

Attending: Vint Cerf (CNRI), Howard Funk (IBM), Patrice Lyons, Stephen Wolff (NSF), Tony Rutkowski (Sprint), Bruce Davie (Bellcore), Gwen Bell (Computer Museum), Oliver Strimpel (Computer Museum), Greg Welch (Computer Museum)

Introduction

Oliver Strimpel initiated the conversation by providing some background on the Museum and the exhibition. The core of the Museum's approach to exhibitry is the 3-minute interactive computer station. Software for such stations are developed through combining in-house efforts, donated programming time, and off-the-shelf products. The group agreed that one of the biggest challenges in planning this exhibition would be to frame a presentation that would be interesting for several years to come. The participants also noted that the exhibition should probably focus on what networks are and what they do first, in order to stimulate interest in how they work.

Vint Cerf recorded a host of topics that might be examined in the exhibition:

Technical Issues

- What is a network? Answer by example: Electronic Data Interface?, ATM, Nasdaq, on-line data system such a Compuserve, Prodigy, etc.
- How do networks grow? Internetworking.
- network scales -- office LANs, campus networks (CMU and Woods Hole (Ballard)), WANs
- Networking technologies--telephone, optical, radio
- ARPANET/Internet--MOSES program?
- speed -- super nets -- high speed gigabyte networks
- Virtual reality
- Public Networking (the phone system)
    - how do modems and faxes work (why are they disappearing?)
    - Universal numbers
- computers in the telephone net
- use of the net for computer communication
- distributed computing and the National Machine Room concept
- Database and network guides -- Archie, Prospero, GOPHER, knowbots, WAIS, virtual notebooks
- grassroots networks -- FIDO

Non-technical Issues

- copyright issues
- intellectual property rights
- liability issues associated with electronic bulletin boards and forums
- security and privacy issues linked to encryption
- Surveillance (Big Brother) and privacy--FedNet/Cross-border dataflow
- Networks as bureaucracy busters -- non-hierarchical e-mail (see Lee Sproul's work)
- Network as instrument of liberation (Relcom-- Soviet net's role in dissolution of Soviet Union -- see Ithiel Pool article in NYT) fax (China).
- Vulnerability--Implications of dependency on networks.
    - natural failures and consequences (NYC fire, Chicago flood, SF earthquake)
    - deliberate sabotage (crackers, viruses, theft of services)
    - breakdown (AT&T crash)

- What should national/international cyberspace look like? (e.g. Sterling's *Islands in the Net*)
- What competitive structures should exist within networks?
- How will networks impact the haves and have-nots?
- fluid social groups created on the fly on networks

Applications

Residential
- electronic publishing--on-line books, magazines, newspapers
- libraries and databases accessible by the net
- smart houses

Industrial
- intelligent manufacturing
- farming -- SPOT

Business/Office
- Role in banking (see Thomas Judd @ Fed Reserve in Culpepper), SWIFT, electronic fund transfer
- Electronic marketplaces-- Nasdaq, commodities
- data delivery--Knight-Ridder (training databases), Mead (Lexis, Nexis),
- video conferencing
- retail-- Gap, Mrs. Field's Cookies, Taco Bell

Research
- Medical Applications--remote diagnosis
- scientific research--SIMNET
- collaborative applications--Telnet (Minneapolis)

Education
- Education--remote teaching, EDUCOM (John Clement)

Government
- Disaster recovery networks--UNDRO, AID-VITA, -- Marty Silverstein
  - earthquake sensor networks
- traffic control
- law enforcement--FBI,

Military
- Defense--distributed war games, networked flight simulators?

History
- pre-ARPANET (smoke signals, teleprocessing, optical telegraph)
- significance of break up of Ma Bell--fax revolution, introduction of new services,
- Jim Pelkey @ Lawrence Livermore has many videos
- Ira Fuchs in ARPRANET film

Exhibit Suggestions
- make this a joint project with other science and technology centers
- link w/ schools
- get Internet Society involved -- solicit ideas over net
- ask industry about their use of networks--IBM, DEC, HP, Salomon Bros., Schlumberger, Mobil, GM, Ford

Minutes: Brainstorming Session for the exhibit *The Networked Society.*
May 14, 3:00-5:00
Wellfleet Communications, Bedford,MA

Attending: Paul Severino (Wellfleet), Howard Salwen (Proteon), Bill Haynes (GTE), David Fowler (Chipcom), Jim McKenney (Harvard Business School), Oliver Strimpel (Computer Museum), Greg Welch (Computer Museum)

Summary

Discussion focussed upon potential case studies of applications for the exhibition, how the exhibition could present future applications, technical topics which ought to be explained by the exhibition, and techniques that could be employed to present these topics.

Introduction

Oliver Strimpel and Greg Welch introduced The Networked Society exhibition: it will focus on the large-scale strategic networked applications of computers, occupy roughly 5,000 sq. ft., open in early 1994, and cost approximately $2 million. They briefly summarized the previous brainstorming sessions and some of the ideas that emerged from those discussions (see minutes from earlier meetings). The basic approach that is emerging is to feature a series of case studies that would take visitors behind the scenes of familiar environments (such as a bank) to reveal the networks employed by different organizations.

Case Studies of Current Applications

Service Providers

Howard Salwen noted that such applications as inventory tracking by Frito-Lay or K-Mart really only represented one-way networking. Instead he proposed the exhibit feature the sort of system Chrysler is implementing in repair bays that both collects data about the frequency of specific repairs on particular models and also supplies information about different vehicles to the mechanic. Jim McKenney noted that American Airlines has a similar system. In a similar vein, he noted that Mass General and Brigham and Women's hospitals have installed networks that permit that remote diagnosis of MRI data.

David Fowler expanded upon the point by commenting that hospitals, in general, represent a good case study. They are a microcosm in which computer networks assist in the management of vast amounts of diverse data. Every patient generates a 30" stack of paperwork, from records of symptoms, diagnosis, and treatment, to forms for billing and insurance.

Howard Salwen noted that airports, too, represent a microcosm that might make a good case study.

The consensus of the group was that the exhibition must also feature a "shared facilities" network, Novell-style, as they are certainly the most widely used sort of network. Salwen suggested looking at Fidelity's teleport net as a case in point, or Empire Blue Cross Blue Shield, or Amex's completely digitized billing and service operations. Jim McKenney mentioned that Consolidated and UPS are similarly networked.

To portray global-scale networking, McKenney also suggested taking a look at Teleport's facility outside NYC. A picture of 200 acres of satellite dishes dramatically illustrates the volume of information transfered in and out of cities every day and the importance of global networks to the infrastructure of modern society.

The group agreed that showing behind the scenes of an ATM was a must for the exhibit. Paul Severino suggested locating the ATM in some distant city, to emphasize the global reach of banking networks.

Other Uses
Howard Salwen suggested the exhibition should also depict what the Internet really does, other than mail. Salwen suggested featuring a scientist's remote use of data from a CERN experiment, or Earth Observation Satellite, which will generate a gigabit of data per second. He and Jim McKenney suggested a display that showed the content of traffic on the net.

Jim McKenney also felt strongly that some sort of point-of-sale application be featured, and Paul Severino suggested McDonalds, partly for its appeal to kids.

Manufacturing
Fowler cited the highly-networked assembly line used by Navistar to mass-produce customized trucks, and noted that a scale model of such a plant using Legos might illustrate how the system works. McKenney has a case study of Navistar's application and mentioned that Boeing's similar system extends out to all its subcontractors.

Future Applications
One of the topics the group focused upon was whether and how to display future applications. As David Fowler pointed out, the exhibit should make clear that these applications are technically feasible today, but are simply too expensive, require too much infrastructural improvement, or bound in red tape to be widely implemented yet. The future applications discussed all revolved around direct consumer use of networks.

Paul Severino suggested featuring the sort of "smart house" network produced by Echelon, depicting some wide-band, multimedia network. David Fowler suggested creating the networked living room of the future, with a direct interactive "entertainment network" feed hooked up to the "all-purpose TV." He advocated focussing of the things people will be able to do, rather than opening the can of worms of who will provide the service and how.

Bill Haynes stressed that, regardless of application environment, wireless networks would be very important and ought to be featured in the exhibition. Howard Salwen responded that the developments taking place in Eastern Europe, which does not have well established wired infrastructure, would indicate how successful wireless technology will be in supplanting cables.

Jim McKenney also recommended portraying some sort of banking service of the future such as Bank of Boston is experimenting with.

All agreed that the area of the exhibition focusing on future applications would have to be designed to allow it to be updated.

Technological Points and Issues

The group felt strongly that the exhibition should also educate visitors about some of the fundamental technical points of networks and features of their use.

Some of the issues discussed included:
- the rapidly increasing complexity of systems and customizing of services,
- the potential for choice offered by networks (over the force-fed nature of current broadcast),
- the collapse of time (illustrate transaction time between NYC and London),
- the shrinking cost curve of communication (vs. computation) (show copper vs. fiber).

Some of the technical points that the group felt the exhibition should explain included:
- how information is packaged in a network (headers, tails, packets, etc.)
- explain protocols, addressing, etc.
- seven layer model
- modulation in fiber
- LAN architecture
- how intercontinental transmission occurs.
- different media (copper, fiber, wireless)
- bandwidth (DEC has demo using metaphor of transferring bricks to build a wall).
- history of networking (punched cards, to time-sharing, to PC, to networks)

-use a trucking company as a metaphor to help people understand how a network functions.

Techniques for the Exhibition

Lastly, the group discussed various techniques that might be used in the exhibition to assist in conveying the topics and themes proposed.

First, Paul Severino asserted the exhibition and Museum must be properly networked. All participants advocated providing visitors with some sort of active badge, smart card, or wireless phone that they would use to interact with the exhibition and that the exhibition could use to track visitors. David Fowler suggested that the whole exhibition might be presented as "A day in the life of the networked society" or as an adventure game.