
V. LESSONS LEARNED & NEXT STEPS

- Rob Semper, Executive Associate Director, Exploratorium

We have had some success yesterday in laying out the landscape and in getting the group psyche. It struck me that although we are from different walks of life we are all grappling with the same issues. However, the goal of this forum is to emerge with documentation that serves as a report to the field at large, and we have not yet discussed how to prioritize the things that surfaced yesterday.

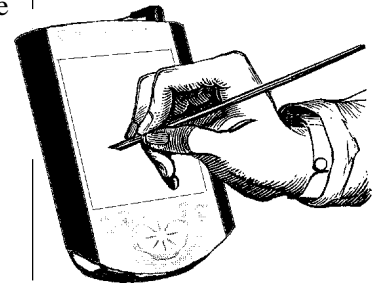
Today we will try to get our hands around lessons learned, what surprised us, and what we see as the next steps in development. We will do that by working in small groups in an attempt to keep the discussion focussed. Each group will generate a list of recommendations. The first set of recommendations will be based on lessons learned. Some of you have expressed an interest in hearing the horror stories from those who have already tested or implemented electronic guides. Our hope is that those horror stories will be translated into lessons learned.

The second set of recommendations will focus on next steps: new studies, points of research, things we don't know, things to be learned. We will then regroup as a whole, hear the reports from the smaller groups, and have the chance to compare notes and discuss the ideas that emerged.

The Task

Working in small groups, generate a list of recommendations regarding:

1. Lessons learned,
2. Next steps.



A. Group One

1. Lessons Learned

Rules of Design

In all of this, the basic rules of design apply: start at the beginning, look at the environment, focus on the use of the device within the space. Start with a prototype and content and the interaction between the prototype and the content. • Rakhi Rajani

Lessons

- Rules of design apply
- Select a minimal set of features and activities
 - Focus is not on the device
 - Device affords user activity
 - Avoid "feature creep"
- Make sure mobile device is what you need
 - Consider the alternatives
 - Benefit to user must outweigh the cost (inconvenience, need to interface, possible limit to social interaction, etc.)

Some people in the group said, "Of course the basic rules of design apply." But I think some museums are not familiar with literature on Human-Computer Interface design. • Natalie Rusk

A Minimal Set of Features & Activities

It's important to select a minimal set of features you're going to address; make it good at a few things. This brings up CoolTown because they made a device for a lot of different things and are now focusing in on one: "remember."

Group Members

- Paul Aoki, Member of Research Staff, Xerox PARC
- Andrea Bandelli, Museum Consultant
- Jenna Burrell, Application Concept Developer, Intel Architecture Laboratories
- Marcos Frid, Research Engineer, Hewlett-Packard Research Laboratories
- Rakhi Rajani, Researcher, Hewlett-Packard Research Laboratories
- Natalie Rusk, Project Director, Electronic Guidebook Project, Exploratorium
- Susie Wise, Senior Producer Interactive Educational Technologies, San Francisco Museum of Modern Art

Is A Mobile Device What You Need?

Make sure a mobile device is what you need. People were saying earlier that you need to measure the benefit versus the cost. Is this really what you need? There could be other ways to do it. • Natalie Rusk

Next Steps

- Increase social interaction
 - Use handhelds as catalyzers for face-to-face interaction
 - What are ways to do this?
- Encourage visitor feedback, reflections, responses, knowledge. Explore:
 - How this works?
 - What motivates contribution?
 - How much will they?
 - When?
 - In what forms?
- Work to make it easy for other museums to learn about what's been done and how they can do it themselves.

The focus should not be on the device but on user tasks. The purpose of the device is to afford user activity. And finally, avoid feature creep. For example, because it comes with e-mail and a browser it's tempting to exploit these but it confuses the user. • Paul Aoki

2. Next Steps

Increase Social Interaction

This could be done with programming, or at some point visitors could put the devices away and connect with each other. The handheld could help increase social interaction. We know that people come to museums to be in a social environment. • Andrea Bandelli

Encourage Visitor Feedback, Reflections, Responses, Knowledge

There are ways that a handheld can help a visitor reflect back, be a constructor, a maker, a responder, not just a rememberer. We need to explore how this works and what that might mean. • Susie Wise

Making It Easy For Other Museums To Do It

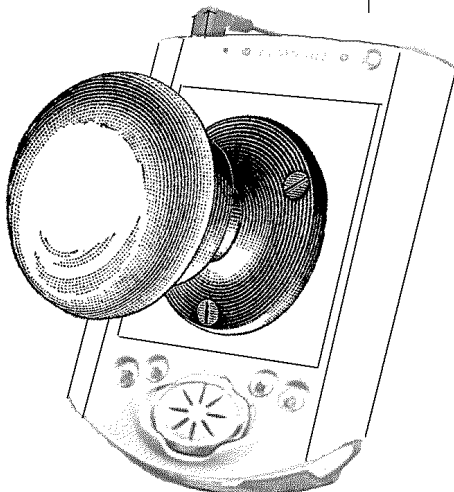
Our final point is to make this technology available. We've heard about customizing for different situations. At CoolTown we are talking about making a starter kit. People will come up with their own custom solutions but you can't expect everybody to start from scratch.

Also, if we have a starter kit we can get other museums to start their own pilots which will lead to a bigger community that can interact virtually, through a Web site. On the Web site you can check out source code and put in your version of it. • Marcos Frid

3. Questions, Comments, Ideas

Starter Kit, Web Site For Other Museums

- Is this something your group was talking about or is this something that Hewlett-Packard is talking about? • Melissa Alexander, Project Director, Origins, Exploratorium
- It's something my boss told me to do. • Marcos Frid, Research Engineer, Hewlett-Packard Research Laboratories
- We're also talking about resources, a place where people can talk about lessons learned – like this meeting, but in a broader forum. • Jenna Burrell, Application Concept Developer, Intel Architecture Laboratories
- So building a community of knowledgeable developers and users? • Rob Semper, Executive Associate Director, Exploratorium
- And bringing other museums up to speed. I think if museums can find out what others are using they'll learn more, faster. • Jenna Burrell,



4. Overheard In Group One - Background Discussion

Visitor Feedback (Thoughts and Reflections)

- There is something that requires more understanding and research – the question of where people want to contribute or feed in. That's different than social interaction. We did originally have an idea where you could see what another visitor is looking at or working on so someone else could come up and interact. • Susie Wise
- Are you talking about feedback that others could benefit from or ways to improve the system? • Jenna Burrell
- You're saying it's their ideas, not so much, "Is it a good exhibit?" • Natalie Rusk
- One thing a museum can be is a place for thinking and reflection and this is a way to encourage that. • Susie Wise
- And otherwise where does that thinking and reflection go? It's in their heads. • Jenna Burrell
- The question is how that would work. • Natalie Rusk
- When will they contribute, and in what forms? • Jenna Burrell

Increasing The Community of Museums Doing This

- One thing I'm working on is a starter kit for museums so that the number of people familiar with using this technology will increase. We have a site for Web developers and one part is for CoolTown ideas, and Mirjana asked me to put together a starter kit for museums. I want to do it on different levels. The first can be super simple. This becomes Web pages and the code is there and works on the Palm, on laptops, on whatever. And when we work on "remember" technology we can put that on there as well. You could make it more general and make the tools and the technology available to other institutions. • Marcos Frid
- What do you think is entailed in that? It's not just the technology, it's also lessons learned. • Susie Wise
- You could have a place where you have links to reports to find out what other users are doing. But from my point of view, you want something quick – so the tools are there and you can use it. • Marcos Frid
- Maybe you want a community to share tools, interests, etc. • Paul Aoki
- This could grow into a monster Web site where all these museums have different questions. It could carry on what's happening here, at this forum. • Marcos Frid
- But only if they have decided this is what they really want to try. • Natalie Rusk
- So one thing is to make sure we share the lessons learned. • Jenna Burrell

Group One - Butcher Paper Background Notes

- Focus on explicit tasks
 - Importance of knowing what they are
 - Example = social interaction
 - give info
 - promote social interaction
- only tapping
- not complicated
- minimal explanation
- experience not about device
- Why using this medium?
- Visitor benefit has to be worth the "cost"
- need motivation to create personal content
- join a community, not burden of starting community
- benefits:
 - leave happier, enhanced
 - engagement
 - "voices" of the place
- cost:
 - physical discomfort
 - learn new system, interface
 - risk to initiate participation
- physical context: standing vs. sitting, space in environment

benefit	cost
engagement	limited social experience
voices you wouldn't otherwise hear	physical inconvenience
richer experience	work w/in context
more info(?)	learn new system
additional media	
different modalities	

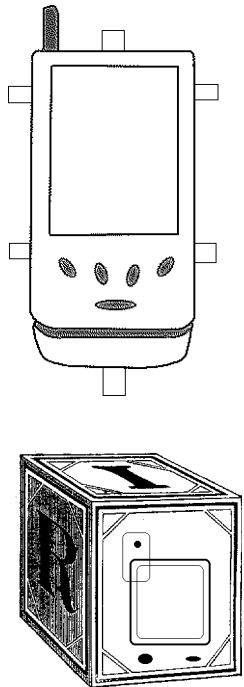
B. Group Two

1. Lessons Learned

We had representatives from two deployed projects and two research projects so there was no shortage of lessons learned.

Group Members

- Katherina Audley, Content Developer, Electronic Guidebook Project, Exploratorium
- Deborah Lawrence, Manager Interactive Technology Audience Services, San Francisco Museum of Modern Art
- Daniel Molitor, Consultant
- Michael Schiess, Project Manager, Physical Science Interpretation, Museum of Science, Boston
- Mirjana Spasojevic, Project Manager, CoolTown Program, Hewlett-Packard Research Laboratories
- Allison Woodruff, Member of Research Staff, Xerox PARC (Mirjana Spasojevic reported results to the full group)



Goals

- Be clear, be realistic
- Time, resources, audience
- Management buy-in, intellectual property issues

Our first lesson involves goals and how much work one has to do setting goals and expectations, and how realistic you have to be. The tendency is to be enthusiastic and to oversell.

Make sure you have management buy-in. One side note was about intellectual property issues – this has to be a multitrust project.

Then it's down to implementation, though our questions concerning the team also have to do with setting the scope. Make sure you have a team that includes all of the necessary skills. That has to include someone with the ability to make decisions for the team and the project. Communication is key because with team members from different institutions and different disciplines, if you don't communicate there can be chaos. So you need a disciplined team, but at the same time you need to allow for freedom and creativity. You also need to know your key stakeholders (e.g., maintenance, visitor services, etc.).

Team

- UI Designer/Graphic Designer
- Content Developer
- Museum Educator
- Exhibit Developer
- Visitor Advocate
- Participant Designer
- Program Manager/Decision Maker

communicate!

Prototypes

- Paper Prototypes/Low Fidelity Prototypes
- Prototype Activities
- Prototype Technology
- Test Very Simple Things First

(Demo vs. Prototype)

Our third set of lessons is around prototypes, starting with the idea of using a paper description instead of a full blown prototype. Then there is the idea of testing prototype activities before prototype technology. In our case [Electronic Guidebook] we did a demonstration. We want to make it clear that a demonstration is different than a prototype. You can use prototypes in a variety of ways, and you can use low fidelity prototypes. For example, if you plan on using a Palm, you can use a wooden block as a stand-in

during early prototype testing. With early testing in general, you can work in spiral development, starting with a semi-working prototype.

2. Next Steps/Questions/Projects

Here we were all over the map. We tried to boil it down to three recommendations and didn't quite succeed, so we ended with four.

First, evaluate and test the choices for content delivery and find out what works for different domains. Different museums have different environments, which feeds into choices regarding content.

Evaluate/Test Choices for Content Delivery

- Text, audio, video . . .
- How it depends on the domain

Evaluation

- Visitor Experience
- How to Measure (quality, quantity)
- Real World Trends (technological sophistication of visitors)
- Surveys, Interviews (use existing)

On the top level there is the question of visitor experience. How do you capture, measure, quantify, express differences in quality? We would like a handle on these questions.

If you are talking about an informal situation, it happens over time. How do you know if the flavor of the individual

experience will motivate someone to be a science teacher years later? How do we measure that?

And how do you correlate the technological sophistication of the user? We have all heard how technologically savvy teens are. What do we know about that and how much does it apply here?

Then we thought about in-depth, specific studies focusing on one exhibit or area, and going really in-depth concerning content and questions.

In-Depth Study

- Narrow Scope
- One Exhibit, One Area

Customization, Personalization - What?

- Pre-, Post-Visit Experience
- When, Where, How Deep Content

Finally, one interesting direction that some projects could take might involve customization and personalization. What does that mean? How do you want it to happen? What and where?

Shallow content? In-depth? Will it stretch into the pre- and post-domain?

So these are our general next steps, around which we could write a new proposal or a two-year project. I think personally we could have spent another hour talking about next steps and some of them are very high level versus very specific.

Overheard in Group Two: How Technology Changes the Visitor Experience

- In our project at Filoli there was the story of a couple going through, using the guidebook. His comment was that he was replaced by the guidebook – he was the one who usually answered questions and assumed authority.

Also, there are people who get the paper guidebook and don't use it because they don't like it. They just wander through, which is a very relaxing experience for them. When they get the electronic guidebook it becomes a task. They learn more but it's hard for me to assess whether that's a better activity. • Allison Woodruff

- It's important to recognize how use of these things changes the experience; it's a different activity. • Daniel Molitor

- Characterizing the visitor experience and how it changes are research questions. • Allison Woodruff

- The socialization things, for me, are the most intriguing but you can't use standard evaluation techniques. • Mirjana Spasojevic

- There's also the question in the larger field. There are kids with pagers and now they have two-way pagers. How is that affecting them? There must be some existing study out there about how this is affecting society in general. • Daniel Molitor

- There's a valid argument that if you're in a museum you want an experience different than your every day experience, so if I use a cell phone in daily life I may not want to use it here in a museum. • Mirjana Spasojevic

- There is something that worries me in thinking about how to evaluate this technology. A visitor could be standing in front of a visit waiting for a video to load. You're observing them and you think, "Wow, they're spending a lot of time with that exhibit. They must be having a valuable experience." And what they're really doing is waiting for a video to load. • Katherina Audley

C. Group Three

Lessons Learned

- Keep it simple
 - Don't do wireless unless your network is stable and well documented
 - Don't use "bleeding edge" technology for your deployment application
- Have enough equipment
 - Doing it with minimum equipment makes the project take longer
- Involve all staff that will be impacted
- Put enough resources into content
- Add a strap

Add a Strap

And finally a simple suggestion – add a strap. • Craig Rosa

Group Members

- Melissa Alexander, Project Director, Origins, Exploratorium
- Scott Beveridge, Internet and Multimedia Exhibit Manager, Museum of Science and Industry, Chicago
- Michael Drennan, Technology Developer, The Tech Museum of Innovation
 - Margaret Fleck, Senior Researcher, Hewlett-Packard Research Laboratories
 - Eamonn O'Brien Strain, Research Scientist, Hewlett-Packard Research Laboratories
 - Craig Rosa, Director of Information Technology, The Tech Museum of Innovation
- Tom Steller, Chief Curator, Natural Sciences, Oakland Museum

1. Lessons Learned

Keep It Simple

Our first lesson is keep it simple. Don't do a wireless project unless your existing network is stable and well documented. On the other hand, if your building or space is old, historical, or tricky it could be difficult to get your network to integrate so another alternative is to skip integrating with the existing network and start new.

Don't use bleeding edge technology in the deployment stage. Instead, go back a couple of steps. Visitors won't cut you a lot of slack – they expect it to work. • Craig Rosa

Have Enough Equipment

Also, if you try to do it with less than you need it will be twice as hard. • Melissa Alexander

Yes – doing a wireless project on a shoestring is tricky. • Craig Rosa

Include All Involved Staff

This means involving your front line staff right from the start. • Craig Rosa

Put Enough Resources Into Content

Put enough resources into content. The "medium is the message" only goes so far. • Craig Rosa

Particularly innovative content. • Margaret Fleck

This isn't just a technology project. From what I've heard, the emphasis on developing content is maybe fifty percent of the project. • Craig Rosa

2. Recommendations

Recommend

- Make prototyping part of museum experience
- Plan for labor intensive user/visitor studies
- Be very clear about what your objective is and only use the application when it's the most effective
- Don't use handhelds for things that already work well

Not up to you

Be willing to say something doesn't work

Make Prototyping Part of the Experience

Make prototyping part of the process of innovation, and part of the fun of being at the museum. Be overt about it – for example, give discounted or free admission to visitors who participate in testing the prototype. This also establishes your brand as being an innovative place. • Craig Rosa

Evaluation and Visitor Studies

Plan for extensive evaluation and visitor studies. • Craig Rosa

Match Objectives and Goals to Use of Appropriate Technology

Be clear on your objectives and only use technology when it is called for. For example, a portable DVD player may be better than a wireless device in certain circumstances. Don't use handheld devices for things that already work well as is. If you have a scavenger hunt that works well with clipboards and the kids love it, don't shoehorn a wireless device into that experience. • Craig Rosa

Recognize When It Doesn't Work (Which Is Up to the Visitor)

Be prepared to say that something doesn't work well. And it's not up to you to decide that something doesn't work; it's up to the visitors. • Craig Rosa

3. What We Don't Know

These are some of the things we don't know:

- What the visitor thinks.
- The impact on visitor behavior.
- What device is the best given for any application? We're still not clear on that yet.
- What is the killer application for a wireless handheld device that you wouldn't want to do on a DVD player, with a clipboard, and so forth, and can we focus on that subset? • Craig Rosa

4. Questions, Comments, Ideas

Identifying Killer Applications/Matching Museum Objectives

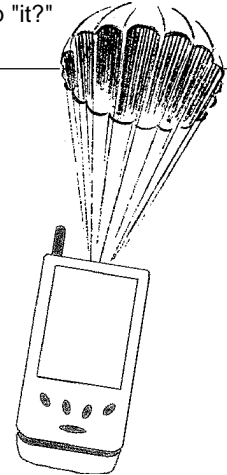
- I'd be curious how people here respond to your last question. We talk about what visitors think; what do we think? What do we think the killer applications are? • Daniel Molitor, Consultant
- You had a good one [at Port Discovery]: kids using a pager to communicate with each other. • Anon.
- But there has to be congruence between what the museum believes it is and what you're providing, so if paging is a long term strategy for connections between exhibits fine. If not, you shouldn't be doing it. The research has to be guided by the museum's choices concerning what it wants to do. • Larry Friedlander, Professor; Co-Director Stanford Learning Lab, Stanford University

Strategies for Coping With "Bleeding Edge" Technology

- I wholeheartedly agree with your comment about choosing technology that is a step or two behind but the problem with the handheld market is that it is moving so fast, if you are two steps behind your device is

What We Do Not Know?

- What the visitor thinks
- Impact on visitor behavior
 - Are we changing their perceptions?
 - Does the device improve their experience?
- What device is best?
- What killer application?
- How far can we drop "it?"



Straps and Fanny Packs

- Make sure the strap fits your audience. It was a huge issue for us. The solution turned out to be a simple off-the-shelf product (a kevlar tether used for camcorders) but it did involve research and testing. • Daniel Molitor, Consultant
- What about a fanny pack? • Allison Woodruff, Member of Research Staff, Xerox PARC
- We found one that fit the device perfectly. • Daniel Molitor, Consultant
- How did you attach the tether to the device? • Margaret Fleck, Senior Researcher, Hewlett-Packard Research Laboratories
- Epoxy - that was another real issue. • Daniel Molitor
- I was amazed that there is no form of strap or lock point on any of these. • Margaret Fleck

Overheard in Group Three: Make Sure the Technology Works & Involving Visitors in Prototype Testing

- What about tolerance for exhibits that don't work? I'm thinking in terms of risk and I'm getting a sense that there's more tolerance for risk at the Exploratorium. Is it different at The Tech Museum? • Eamonn O'Brien Strain
- People treat technology like they do their PC – they get frustrated if it doesn't work. • Craig Rosa
- At The Tech we have a very aggressive engineering staff to make sure that there aren't downed exhibits. Our up time is about 98%. If you handed someone a computer at The Tech you would have to go beyond: "Oh wow, I've got a computer." • Michael Drennan
 - When we were testing devices at the Exploratorium people seemed to understand that it was a prototype, and we gave them a cool pen at the end for participating. I think it would have been different if it had been an experience they paid for. • Margaret Fleck
 - One thing I've been thinking about at The Tech is the idea of getting people involved in testing the technology. That way they feel they're part of the innovation and I think they'd find that even better. So giving you feedback would be part of the fun. • Craig Rosa

obsolete and there's no support for it. • Jim Thornton, Member of Research Staff, Xerox PARC

- We were thinking more of software and also of the next range of deployment in museums that are less well staffed. • Margaret Fleck, Senior Researcher, Hewlett-Packard Research Laboratories
- Maybe the solution is to budget in changing technology over a four to five year project so you could always feed new devices in. For example, you could plan for three swap outs in the life cycle of the project and build that into the cost, knowing that the problem of obsolescence will be there. • Craig Rosa, Director of Information Technology, The Tech Museum of Innovation
- There's a secondary market the obsolete devices could feed into, like the one at Stanford that distributes textbooks to third world countries. • Margaret Fleck
- I'm struck by lease terms and the question of how you make the right device-time trade-off so you can move on. • Rob Semper, Executive Associate Director, Exploratorium
- And where is the innovation focused: on hardware, software, design for interaction? The latter will last the longest. This is an enormously important question if you want to have something sustainable. • Larry Friedlander, Professor; Co-Director Stanford Learning Lab, Stanford University
- You can have a system where content is stored in a data base and you hook into it. • Scott Beveridge, Internet and Multimedia Exhibit Manager, Museum of Science and Industry, Chicago
- It's hard to separate the ability to innovate on the software side from the hardware. Right now there are a lot of limitations. • Allison Woodruff, Member of Research Staff, Xerox PARC
- But if you are doing a research project, research is about innovative design and use. I agree that hardware functionalities are configured so it's difficult to pour from one to another. • Larry Friedlander
- But the process should get better. Look at laptops – now any random laptop can do what you want it to do. We're right at the beginning of handheld technology. • Margaret Fleck
- In a few years it could be that people bring their own devices and what we're providing from a network they feed into their own handheld device. • Larry Friedlander
- Is the model going to handing out devices ala audio tours or are we assuming the technology will be ubiquitous enough so that people will have them? • Craig Rosa

A Focus on the Message, Not the Medium

- All this gets back to a basic museum issue which is: what do you want your museum to be doing? It's like the television issue. A television can be the size of your watch, the size of a wall, or whatever; the content makes the difference, and the content creates the identity. The medium is transparent. So we need to be planning for a time when the technology is ubiquitous and unimportant. • Daniel Molitor, Consultant

5. Overheard in Group Three - Background Discussion

Evaluation Issues and Questions

- Part of the prototyping process has to be visitor evaluation, but it's not whether you think it works, it's whether the visitor thinks it works. SFMOMA appears to be doing that and I hope they get valuable information. You have to put in a ton of time. I would think you need a whole evaluation scheme including formative and summative.

Looking at the lists of what we don't know, a lot of that is from the visitor's point of view. Retention came up yesterday, and the idea of how much retention has to do with knowledge. That's something we don't know a lot about. • Tom Steller

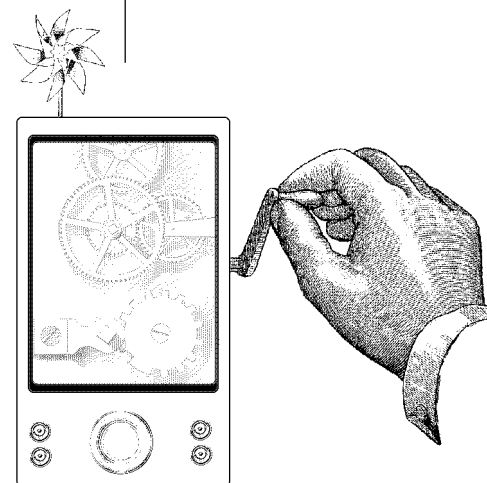
- I would like to see research on the impact this has on people's behavior; the impact on their everyday life, on their viewpoint. • Scott Beveridge
- This is a question museums ask themselves constantly. I think just looking at it as a question of: by the time they leave, how did it change their perception? • Tom Steller
- But the impact may not show until four or five years down the road. Asking people right after they leave might not have much to do with what you really want to know. That's what worries me – the time scale. • Margaret Fleck
- We have people say, "I came here three years ago and it made me decide to be a doctor," but that's what we get – stories. • Scott Beveridge
- What about these devices enabling evaluation? You would only get a sample but you would get a lot of feedback. • Eamonn O'Brien Strain

Involving Frontline Staff

- One thing I'm hearing is that you have to get the frontline staff involved from the early stages. • Craig Rosa
- That should be extended to all involved or interested parties. For instance, docents are a big issue for me. If they can be involved from the beginning instead of saying to them, "We've developed this: live with it." • Tom Steller
- What if we say, "You don't have to give the same tour over and over, because the device will do that. You get to do the fun things" • Scott Beveridge
- But again, that's involving them from the beginning. • Tom Steller

Ongoing Maintenance - Keeping It Simple

- What about an IT plan or maintenance plan? • Melissa Alexander
- I think that's why you want it to be reasonably simple and standard, so you can keep it going. • Margaret Fleck
- Experience Music has fifteen staff just to keep it going. • Scott Beveridge
- I think it's going to settle down the way the Web has settled down. Select the simple software because it's better. There is also the problem of shifting models. You want to have something simple enough so you can have half this year's model and half last year's. • Eamonn O'Brien Strain
- One of the lessons is that you don't want to use bleeding edge technology. If you really want your Web site to be readable by everybody, don't use some of the trendy extensions. • Margaret Fleck



D. Group Four - The Next Step Project

Group Members

- Keith Braafladt, Director of Learning Technologies, Science Museum of Minnesota
- Larry Friedlander, Professor; Co-Director Stanford Learning Lab, Stanford University
- Michael Petrich, Co-Project Director, Playful Invention and Exploration Network, Exploratorium
- Margaret Pezalla-Granlund, Museum Consultant
 - Susan Schwartzenberg, Senior Artist, Exploratorium
 - Jim Thornton, Member of Research Staff, Xerox PARC
- Karen Wilkinson, Co-Project Director, Playful Invention and Exploration Network, Exploratorium

i want to be the guide too...

user adding an annotating experience

Museum Driven

I'm going to start for our group, talking about "The Next Step Project." The first characterization of the project is that it is not driven by devices but by the museum itself – by the way the museum encourages new ideas and projects to be formed. • Michael Petrich

In terms of not being device driven, the idea is to not have so many parameters; to look at the big picture rather than focus in right away. • Karen Wilkinson

Not More Content; Different Voices

Also, in this project we are proposing content is not the focus. Even though the mission of the museum is to enhance understanding of science on the part of the public, this is not about content. It is not necessarily that we need more content or content in a different medium, but rather that we need to diversify the sources of the content. For example, a scientist, an artist, and a ten-year-old talking about the Echo Tube. The idea is that different voices might model in some way the education that may happen through personal experiences and interaction. • Michael Petrich

The Role of the Device

Mediator, Manager, Order & Access

This, in turn, will force us to identify a project where the handheld device mediates, whether through devices like audio, or video, or a little pad that allows you to sketch. • Michael Petrich

We also thought that maybe the device's role is to order, suggest, or make sense of the experience. • Karen Wilkinson

It seems that the mediation function of the devices, where we make meaning ourselves, needs to be thought about quite a bit. There was the idea of how we take personal devices and build into them functions more related to the behavior we all have when understanding and sorting information. Probes get into that in some ways. • Michael Petrich

Next Step Project

- Driven by museum not device
- Not about more content
- About different voices
- Device provides access and order
Device as mediator & manager
- Pay attention
- Ratio of investment to payoff
- Take Away

Paying Attention

Models that we might build on includes one at the Minneapolis Institute of Art that Larry Friedlander mentioned. There are four or five works of art and a stack of blank four by five cards. And, posted nearby or scanned in there are cards on which people have drawn their own version of the art or have written what they like about it. What is important is sitting and reflecting, and that is the piece of art that Larry remembered. • Michael Petrich

Everyone who is a teacher knows that what is most important is getting people to pay attention. Can handheld devices help to do that in a really fruitful way? • Larry Friedlander

Investment & Payoff

We also talked about the problem of the ratio of the investment to the payoff. This is highly expensive and time consuming for us and for the visitor, so there has to be a payoff. We have heard how people turn the devices back in if they're too much hassle to use. • Larry Friedlander

Take Away

We want something people can take away and build on so that the experience in the museum is just the beginning, rather than the end. • Larry Friedlander

Questions, Comments, Ideas

Impact on Exhibit Development & Connection Between Exhibits

- One comment I have is, what effect is all of this going to have on the general development of exhibits? At what point do we start to think differently about the way we use the technology so that we can take advantage of it? Or will it limit exhibit development because you can't take advantage of the technology? • Daniel Molitor, Consultant
- That's a terrific point. Exhibit design is a shotgun effect. If you knew content delivery would happen somewhere else you could be more focused, powerful. You're not cluttering up the effect so it could be more streamlined. What if you had a biology exhibit and with the handheld device they could say, "I want it to be about chemistry." You could distribute the exhibit in an interesting way – in the mobile device, not in the exhibit itself. • Larry Friedlander, Professor; Co-Director Stanford Learning Lab, Stanford University
- What goes where is an interesting question – whether in the exhibit or in the device. And yesterday there was the question of whether this should be portable or ubiquitous. • Rob Semper, Executive Associate Director, Exploratorium
- And connection between exhibits is a big issue. You don't want to do it on the floor because you want to have it open, but you could do it with the handheld. • Larry Friedlander
- That's a good point. We think in terms of content development but the best use might be for spaces where there is no physical content – the spaces between. • Daniel Molitor
- For example, in an art museum you might want to focus on color, then go back and focus on historical period. I think there's too much information in museums. I spend five minutes and then go get a cup of coffee. This gives a way to manage the information. • Larry Friedlander
- So it is a device that is almost a manager. • Rob Semper
- It gives *you* the ability to be the manager. • Member of group four

Overheard in Group Four Discussions

Changing Technology - Impact on Goals

- The challenge is always a top-down, bottom-up system when you're doing things in leading edge technology. A lot of these things were not possible five

something that helps me stop - have intimate experience w/ something...

The Role of the Device

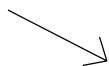
- This is really about how the device can be a mediator and a way of providing attention and focus. • Rob Semper, Executive Associate Director, Exploratorium
- So the device can be mediating with an exhibit and can add different capabilities according to the visitor's questions. • Larry Friedlander, Professor; Co-Director Stanford Learning Lab, Stanford University
- Interesting – this relates to the idea that came up yesterday of visitors using these devices across museums, collecting things of interest to them. • Natalie Rusk, Project Director, Electronic Guidebook Project, Exploratorium

Make it really rich
organized data → *Picking a different voice - to hear from about what you're seeing*

Industry Research Goals vs. Museum Goals & Investment vs. Payoff

- The interesting question for me is that with all this fancy hardware and software you may get something that works, but how useful is it to the museum? Researchers want to push the field, get a bandwidth of usefulness this big into something this small. Museums have to worry about resources. Mixing together research and the mission of institutions is a difficult thing. You don't want to subsidize industry research do you? That's an expensive proposition. If the end result is that it's just adding high tone to a moment that's a lot of money for a small addition. So one thing is, how does it integrate into overall museum planning? • Larry Friedlander, Professor; Co-Director Stanford Learning Lab, Stanford University

Excerpts from Michael Petrich's notes



years ago because the hardware was not available at a reasonable cost. So there's going to be a tension continually for some time with goals and objectives. • Jim Thornton, Member of Research Staff, Xerox PARC

Using the Technology - Walkie Talkie Toys or Based on the Museum's Mission?

- Daniel Molitor said that in the Port Discovery project they found that visitors want to talk to each other. That's something you could do with walkie-talkies. It's an interesting issue: what *do* people want to say to each other? Let's talk to each other in space and time. It doesn't have to do with devices, toys can do that. • Keith Braafladt, Director of Learning Technologies, Science Museum of Minnesota
- Is it based on what the museum wants to do? That's what people do on their cell phones – call to let their family know they're two blocks from home. It should be based on the museum's mission. • Larry Friedlander, Professor; Co-Director Stanford Learning Lab, Stanford University

A Personal Device for Collecting Thoughts, Images, Information

- I am thinking these devices can be more and more interesting depending on how they tailor them. If you can download stuff about light and color, I would like to be able to take pictures too. Rather than downloading data, I would like to use it as a notebook. And later that day, as I rode on a bus to the Museum of Modern Art I could notice how the light looks in the fog. And then I could go to a show on Impressionism and see how they dealt with light and color. • Susan Schwartzberg, Senior Artist, Exploratorium
- So museums would be the context with museum resources available. • Keith Braafladt, Director of Learning Technologies, Science Museum of Minnesota
- But you could chose what you wanted. • Susan Schwartzberg
- And the museum wouldn't be defining it. • Keith Braafladt, Director of Learning Technologies, Science Museum of Minnesota

Moving from guide model → invitation model

STUFF we share → how do we let them create something else w/ this...

connect museum experience → real world experience

design it so you don't have to do much w/ device (menus etc...)

Being able to invest/construct meaning into the thing....

more flexible / access info. → but add new things

(capturing) conversation starters

commenting/talking about something.... → add one more environment (like outside.)