MIT Media Lab Trip Report

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Abstract — **This paper contains the trip report for the AOLTW visit to the MIT Media Lab. It contains information on the presentations during the information: organized and Changing Places symposiums for sponsors.**

Index Terms — **MIT Media Lab, information: organized, i:o, Changing Places, university, sponsorship**

I. OVERVIEW

THE visit to the MIT Media Lab was arranged by the university coordinator, Amy Hale. AOL was invited to the Media Lab as visitors based on the sponsorship that Time, Inc. has for the information: organized (i:o) consortium. The expected outcome of the trip was to bring back information on research that is being performed at the Media Lab in the realm of new ways of data representation. Also, the trip was to see if it would be beneficial for AOL to sponsor activities at the Media Lab directly.

I attended representing AOL Internal Computing. Other attendees included Harry Morris, Architect from the AOL Center for Innovation, the VP of the Electronic Devices (Digital Household?) team, and at least one technologist from the Office of the CTO.

Attendees of i:o were also offered the chance to stay for the first meeting of the Changing Places consortium the next day. I attended most of this event as well, and while some new information was gained, a lot of the new consortium is based on work from the i:o work currently. The CP consortium does include work from the Department of Architecture as well as the Media Lab in an effort to look at new places of work and living. As the Changing Places consortium expands, AOL might be interested in direct sponsorship of the consortium to align efforts with the Digital Household initiatives. Currently though there isn't a great departure from the i:o consortium efforts which Time, Inc. already sponsors.

The event was broken down into brief research updates from the various professors at the Media Lab and demonstrations from the students on the projects they are working on. The research updates ran about 5-10 minutes each. Also a couple of external industry organizations (Johnston & Johnston, and Danger.com) made presentations as well. I will break the trip report down into five sections, this Overview, i:o Research Updates, CP Research Updates (on topics that differed), Industry Presentations, and Personal Comments.

If you would like to review my raw notes you can view my online blog (web log) at http://www.tp.org/jay and search for the Raw MIT Notes entries, which there are two of.

For information on the research projects at the Media Lab, please see: http://www.media.mit.edu/research/

II. I:O RESEARCH UPDATES

For an overview of what the information: organized consortium is all about, I'll go to the source, and quote their webpage:

> "information: organized (i:o), formerly News in the Future, seeks to further innovations in information technology, to understand how digital content can enhance the human experience. As the digital age continues to change the way that information is collected, presented, and disseminated to the public i:o will respond by focusing its core research on three areas: description: "intelligent" machinery for describing and analyzing digital content; design: new, expressive modes of presentation and visualization of digital content; and debate: tools to engage "information consumers" in new types of discourse around digital content. (Includes the research of Bender, Csikszentmihalyi, Davenport, Maeda, Mikhak, Resnick, Schmandt, and Smith.)"

Now that we have an overview we can investigate the research updates given by the various professors.

1) Electronic Publishing Update
Walter Bender, Executive Director Media Lab, and Principle Investigator of Electronic Publishing

The presentation was both an update on some of the activities of the Media Lab as well as a research update on specific areas.

One area of research at the lab currently is in regards to recording EVERYTHING. Not only would this be recording all conversations, but also as many environmental variables as possible. By doing so a more complete picture of an event is on hand both for an individual's memory recall as well as for providing the most available information to search on in the context of computing.

An important concept to remember regarding information is that it is referenced most times in a bottom up fashion vs. a top down fashion. While information is often categorized after the fact in hierarchal fashion, it is almost always the specifics

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of a piece of information that are stored and retrieved and not the statistics of the storage. When searching for information we are often not looking for the fact that we have 4,302 stories regarding highway litter… but for an article on the problems caused by litter.

What is news? A classic example:

1. dog bites man – not news
2. man bites dog – news
3. man eats dog – not news in Korea

Ontology is the mining of local common sense. With the above example man eats dog isn't news if you are in Korea, but it would most likely make the news in the Boston area. Along with the obvious portions of ontology such as what relates to specific demographic, there are studies that link the local common sense to the organization of information as well. When users utilized aspects of ontology organizing information instead of classic keywords, there was an order of magnitude in the relevance of information searched for.

Tools of persuasion in the form of new technologies are being developed to assist us in our decision making process. Once the tools understand how we are limited in our decision making capabilities, the tools can focus on those aspects instead of just reacting to the input we give.

Common sense tools are being developed at the lab in order to capture the aspects of ontology in regards to the organization of information. Once the tools are developed we achieve a large amount of information, presented in a form that relies on our local common sense. Manual tools of this already exist in the form of local newspapers. For example, a non-Bostonian reading the Boston Globe would miss many of the inferred meanings of various statements, while someone from Boston would immediately realize the relevance. As automated tools are developed, the information they provide has a more immediate and greater impact on the user.

As with most new technologies a key driver is a consumer. An example given was technologies sharing relevant information. Today's cars have many sensors built into them. With that ever increasing amount of information, decision making processes to allow consumers to make informed decisions, *at the right time*, will follow. If for example your car can tell when it is time to change the tires, and it is has connectivity to other potions of your life, then you could start seeing more tire commercials on TV or the radio. The information is presented to you at the right time, and in a fashion that does not change the way you would normally be doing things; if you have to have commercials, they might as well be relevant.

So, where is the value in the organization of information? In 1992, Haase stated the value was in the links of information to other relevant information. Ten years later, the value is in the context of the information and we leverage that information through the network.

2) The City That We Want: Brazil
David Cavallo, Principal Investigator of Future of Learning Group

First off, the speaker did acknowledge that Brazil is a country and not a city. He also acknowledged that while we probably don't want all aspects of Brazil for our cities, some new ideas in education being investigated there are leading to good success in education of the future leaders.

Three years ago there average computer to student ratio in the US school system was 1:6. While that ratio has gotten better today the speaker challenges that a person would be hard pressed to find good things that are coming out of it. The speaker challenges that it is not the technology that is lacking, but the fact that it has slipped from being a tool to a focus.

Two examples were given, both from Brazil. The first was from a San Paulo school. Kids were asked if they could fix anything in their city what would it be. Immediately the children wanted to fix the lack of recycling and thus trash build up in the city. The students were given the task of creating a model to help alleviate the issue. Technological tools were given to them such as the Lego Mindstorms Bricks, sensors, and modeling tools.

During the construction of the model, it was observed that the tools were never a focus, and it was always just a matter of using the tools on how to solve the problems. Instruction wasn't given on how to program the Bricks or the proper ways to use the tools at all. The kids figured that out as they went along and again, did not focus on them. In the end the kids came up with a recycling system that would identify waste products and reject them if they were the incorrect materials for that bin.

Another project that the kids worked on was an improved toilet that separated the various forms of waste and made appropriate decisions based on that… he left that to the imagination of the attendees. ☺

The second project, which I didn't catch the location of, focused on rural education to solve local problems. At the project site, the local populous could not grow their own foods and were relying on imports. 70% of the population was illiterate and training them with traditional methods was not working. Technology was turned to in order to assist their learning how to garden properly. In this particular case, solar powered sensors were created that could be checked by the locals to see when to use pesticides and fertilizers. Through this method the locals self-educated themselves and food production is now up for the test areas.

3) Artistic Refiguring of Technology
Chris Csikszentmihályi, Principal Investigator of Computing Culture

Unfortunately it was a very intense presentation and I did not get any notes. I'll paste in the information from the Computing Culture webpage.

"The Computing Culture group works to create unique media technologies for cultural applications. Projects will result in specific works of art, but will also help further an understanding of the relationships between new media and cultural production. Some of the strategies we utilize include interventions in contemporary consumer electronics, creating special events for public situations, and applying technical research and development to cultural agendas that wouldn't normally receive them.

"Our emphasis is on physically embodied, rather than screen-based or virtual, work. Specific research directions include: creating new technologies for cultural groups or agendas that don't usually get them--one example is the DJ I, Robot project, the first random access robotic model of a human hip-hop DJ; developing alternate applications of existing technologies--for example, the possibilities of console computer games have far outweighed their actual applications, and we hope to find new interfaces, economic models, and development strategies might make them as expressive a medium as film or photography; and understanding the unique opportunities afforded by new media forms, such as telepresence, or extending contemporary art forms, such as video installation. "

4) *Video for Everyone*
   Glorianna Davenport, Principal Investigator of Interactive Cinema

This presentation focused on several of the student researchers projects. Unfortunately they were just quick overviews of each.

Filmmaker and Camera Partnership (Barbara Barry) – With this project the student filmmaker donned a camera 24x7 in order to be able to capture all important pieces of her day. One thing quickly learned when using the camera in this fashion is the amount of scenes that are captured that could never be recreated and the importance of those pieces.

Networked Camera (Pengkai Pan) – The example setting for this project was a wedding. By networking several individuals together in order to be able to view each others current shots, the overall quality of the effort was enhanced. This was mostly due to be able to get multiple angles for scenes and not having to rush around if it was being shot solo. The experience is fun and engaging for consumers, as they don't have to worry with missing something.

Video Weblogs (Aisling Kelliher) – This project was video diaries to help people reflect and make sense of their lives. Some of the work can be viewed at: http://www.audiovisceral.net

5) *Process Modeling*
   Bakhtiar Mikhak, Principal Investigator of Learning Webs

Utilizing easy to customize logic bricks (named CRICKETS for the first generation, TOWER for the current generation) the team was able simulate many different processes and flows. Some of the key points:

Tabletop Process Modeling Toolkit
- for collaborative design and construction of tangible, real-time, and interactive simulations that model complex network and system dynamics
- includes tools for building multiple visualizations
- applications include:
  o Engineering: networking – tabletop Internet
  o Management: modeling information flow in an organization
- collaboration with the US Postal Service (also a Media Lab sponsor) to create the toolkit

Collaboration with the USPS assisted in creating the toolkit. The toolkit allowed modeling of information flow and mail flow and new business models for the post office of the future.

The problem to be solved at the USPS was analyzing mail flow which is very challenging due to the varying way that mail moves through a processing plant. Different types of mail have different delivery standards and therefore separate streams within a facility. All of the separate mail flows move through automation and mechanization within a postal facility and it creates a complicated web of physical and information flows associated with each mail stream. The existing simulation models are hard to customize and require time to setup.

With the postal service, the hands on managers do NOT have input to much of the simulations as they are busy with the day to day. Previously process modeling would get dumped in order to focus on immediate needs since it was so complex and the hands on managers could not readily access the models.

The idea was to create a tool to allow postal managers and supervisors to work collaboratively around a table to develop intuition for different flows and how they impact one another. The goal was to focus on the human issues vs. the technical issues.

By using a programmable brick called TOWER, the team was able to collaborate quickly and easily and not get hung up in the technology of the process modeling and work on getting to the mail flows themselves. The TOWER bricks, which were previously CRICKET bricks, are a modular electronic package consisting of stackable boards that are easy to operate. Using this package many more people are able to utilize electronic prototyping without having to have specialists as involved.

6) *Speech Interfaces*
   Chris Schmandt, Principal Investigator of Speech Interfaces

Unfortunately my notes were lost due to an Intel Web Pad problem. I had attempted to use the device to take notes while my laptop batteries were recharging, but the web browser that Intel has, does not follow common convention of allowing back and forward browsing while keeping information in filled out forms. As a result I went back to check something, and

when I went back forward the Web Pad lost my notes. I'm pasting in the web site information for the Speech Interfaces research.

> "The Speech Interface group uses speech technologies and portable devices to enhance human communication and make digitized audio more useful as a data type. Our focus is on developing novel applications, user interfaces, and services to exploit computer speech processing for interacting with and through computers far removed from keyboards and monitors."

7) Sociable Media
Judith Donath, Principal Investigator of Speech Interfaces

Again, unfortunately my notes were lost due to the Web Pad mishap. Here is the information from the web site on the Sociable Media website.

> "The Sociable Media group investigates issues concerning identity and society in the networked world. We address such questions as how do we perceive other people on-line? what does a virtual crowd look like? how do social conventions develop in the networked world? Our emphasis is on design: we build experimental interfaces and installations that explore new forms of social interaction in the mediated world."

I do have a couple of comments on some of the research that I remember from this team however. The first involves one of the research projects regarding the visualization of Usenet data. Usenet News presents an interesting opportunity to have a large amount of written data by a variety of authors in an electronic format. The research was based around the idea that a lot can be learned about society in general and the inner-workings of specific groups of people based on newsgroups just from the ebb and weave of the words in posts. Moods were assigned based on word counts and the group mood could readily be observed through visualization. Overall this was very interesting research in order to determine behavior patterns and even how get specific reactions from groups of people.

The second piece of work that I recall was in regards to analyzing email TO/FROM/CC headers to determine circles of influence. By utilizing mail server data and the history of the headers a lot of work was done to create influence trees for people who had never even met. Once the trees were created information flow could be graphed throughout the circles. One application that came out of the research was the ability to display information on a "printable floor" to establish points of references for individuals to discuss. Even if they had never met, most individuals had at some point seen the same piece of email and keyword reference could be made for it.

8) Affective Computing
Roz W. Picard, Principal Investigator of Affective Computing

Again, the web pad fiasco struck. Here is the blurb from the web page:

> "The Affective Computing research group aims to bridge the gap between computational systems and human emotions. Our research addresses machine recognition and modeling of human emotional expression, machine learning of human preferences as communicated by user affect, intelligent computer handling of human emotions, computer communication of affective information between people, affective expression in machines and computational toys, emotion modeling for intelligent machine behavior; tools to help develop human social-emotional skills, and new sensors and devices to help gather, communicate, and express emotional information."

There were several projects that the team has been working on that might be of interest. One was the measuring of physical actions to change the way a computer would prompt and interact with a person. After many studies and interviews several key criteria were determined to be easily identifiable my computers. By using pressure sensors in the chair of a person, eye tracking/facial expression tracking, mouse movement and hand pressure on the mouse, computer prompts could be adjusted to react to the user.

9) Cognitive Machines
Deb Roy, Principal Investigator of Cognitive Machines

Again, the web pad fiasco struck. Here is the blurb from the web page:

> "The Cognitive Machines group combines aspects of artificial intelligence and cognitive science to develop, implement, and test models of learning. The overall goal of this effort is to gain insights into human cognition by building computational models of infant development, and conversely, to build intelligent machines by modeling human abilities. Emphasis is placed on systems that learn from speech, video, and other naturally occurring data. To handle sensory signals, we employ and extend methods from speech and multi-modal processing, pattern recognition, and machine learning. Initial work has focused on automatic acquisition of spoken language from audio-visual input. Applications include adaptive speech-based, human-computer interfaces for multilingual computing, assistive aids, entertainment, and command-and-control."

Imagine describing a piece of video footage using natural language to a computer, something like: "Show me footage of President George Bush in the White House Rose Garden with Millie the dog." The Cognitive Machines research team is working on achieving that with the aid of IBM. Some of these things are already available through manual annotation of images; the goal of the research though is to allow the machine to recognize images on its own.

10) Synthetic Characters
Bruce Bloomberg, Principal Investigator Synthetic

Characters

Again, the web pad fiasco struck. Here is the blurb from the web page:

> "The Synthetic Characters group's goal is to understand the nature of intelligent behavior. By intelligent behavior we mean the kind of everyday commonsense displayed by animals such as dogs, helps insure that "they do what they ought to do", "learn what they ought to learn", "move the way they ought to move", and ultimately evoke the same sense of empathy and understanding that dogs do. Our approach is summarized by the points.
>
> *"Use models of animal behavior, learning and training as our inspiration.* There is a wealth of untapped observational data, conceptual models and experience on which to draw. In addition, animals provide a tangible target to shoot for. For example, can we build a class of system which learns the types of things that are easy for a "dog" to learn?
>
> *"Embrace the inherent interconnections between motivation, emotion, perception, behavior, learning and motor control.* Thus, we attempt to understand these functions within the context of a complete system rather than study each in isolation.
>
> *"Gain understanding through the process of constructing complete creatures and discovering what works and what doesn't.* As we build ever more complex creatures, we will gain valuable insights as we discover what ideas carry over from simpler creatures, and what ideas simply can not be scaled up.
>
> *"Use animated characters that interact with human participants as our medium for exploring these issues.* With animated characters there is no place to hide and faults are readily apparent."

11) Critical Computing

Brian Smith, Principal Investigator of Critical Computing

Again, the web pad fiasco struck. Here is the blurb from the web page:

> "The Critical Computing group explores ways that static and moving images can become primary tools for reflection and explanation. We develop technological and conceptual architectures around imagery that allow people to construct and communicate their understandings in new ways."

III. CHANGING PLACES RESEARCH UPDATES

To start out with it would be good to have an introduction of what Changing Places is all about. The following is from the Media Lab Research website:

> "Changing Places (CP), a joint Media Lab and Department of Architecture consortium, explores how new technologies, materials, and strategies for design can make possible dynamic, evolving places that respond to the complexities of life. It is an expansion of the MIT House_n Consortium. Central to this research is the development of a home-scale, occupied "Living Laboratory" - an agile facility to test new design, construction, and digital infrastructure concepts. The Living Lab will enable ongoing scientific studies into the real-world impact of design and technology for preventative health care, energy/resource conservation, human-environment interfaces, and links between the home and changing places of healing, work, learning, and community."

More information on the consortium can also be found at:

1) Overview and Proposal for a "Place Lab"
Kent Larson, Director of Changing Places Consortium

The new consortium Changing Places attempts to take two subjects, Buildings and Technology and blend them together. Buildings are permanent places and life and technology are all about change, so Changing Places was thus born. The consortium grows from the original House_n work by combining programs from the Media Lab and the Department of Architecture at MIT.

The Department of Architecture is about places and utilizing technology in places. The Media Lab is about technology and of course technology is used in places. The House_n Program is about the fact that there is no single solution for places. The n is used as the variability in the places. The work continues with previous visionary architects work such as Fuller and Gropus.

Homes of the future will not merely be the place to sleep, relax, and eat. They are expected to become the place for health care delivery, energy production, and commerce as well. With all of the new functions of homes, choices are important as more and more time is expected to be spent there.

CP is currently conducting research on the future process of building a house. Over the next 10 years, a couple will play design games online in order to establish their needs and work through the design of their own home. A preference engine will gather information about the homeowners, their needs, their wants, and the functions they expect to have within their houses. As information is gathered in this fashion, a design engineer will then generate custom proposals for the couple. This new process is enabled through the use of web based design tools, CNC mass customization, and rapid field assembly.

Creating an agile and modular environment is key to be able to rapidly change to meet the needs of occupants. Digitally tagged components (as well as people) and sensor arrays throughout the house, will allow the home to reflect the needs and values of the occupants.

The House_n portions of the consortium focus on:
- New design tools (for democratization if architecture)
- New ways of building (integrated components

accommodating change)
- Connecting anything, anywhere, anytime {*jm note: hey, they stole my line... or we stole from the same place!*}
- Chassis based wiring and other technology enablers
- Hybrid lighting as a utility

New technologies that will enable the house are:
- Anywhere displays: project laser drawn images anywhere to relay information to people, an example is on a lampshade print: "This costs 4 cents/minute"
- Emergent materials: high performance, net_0 energy use

Untapped consumers are one reason that technology companies be interested in the ever changing places. For example $2.3B/year is spent on residential broadband and $30.8B/yer on home computers. But by comparison, $368B/year is spent on home improvement and residential construction!

There are three "places" that the consortium is focusing on; the home with the House_*n* team, the workplace with the Agile Workplace team, and the city with the Urban Narratives project. The laboratory for the work is being proposed and built now. It is the Place Lab at MIT and will be adjacent to the Media Lab. In the classic way of doing things at MIT, the Place Lab will be for research and not for prototyping. It will be up to sponsors and the industry to prototype and bring to market new ideas born from the research.

Several activities will be performed by testing with people at the Place Lab, a few are listed below:
- Preventive Health, Health Delivery, etc.
- Interfaces with the place
- Models of behavior
- Technology in the context of a real life place
- Just-in-time information delivery, delivering the right message, at the right time, in just the right way

Investigation in creating a community of Place Labs is underway as well. Finland is looking to build a Place Lab to study energy and wireless, Korea to study high density urban housing, and Portugal to study application of technology to older buildings.

2) Bits and Atoms
Neil Gershenfeld, Principal Investigator of Physics and Media

Unfortunately as with most of the research update presentations they were too fast paced and multimedia oriented to take good notes, so once again I turn to the write up from the research web site:

> "The Physics and Media group studies the relationship between the content of information and its physical representation, from molecular quantum computers to virtuosic musical instruments. Research includes fundamental studies of the physics of computation, applied development of devices and algorithms for user interfaces, and collaborations ranging from creative expression to industrial applications."

Currently they are breaking ground on the new addition to the Media Lab which will include the above Place Lab as well as The Center for Bits and Atoms. The future of personal computation is person fabrication, which is good that things are heading in that direction. The most advanced technologies are needed in the least-developed countries, by leveraging personal fabrication; those countries can then enable more people through the use of technology that has direct application for them.

The home of the future doesn't respond with: "The House Just Crashed, Click (OK) to Continue." At least we hope not. It will have a network of switches, lights, and controls though. ID tags will be embedded so that when they are physically moved they associate properly. RS-432 works well for the physical wiring at this time. The killer app for smart buildings is simple, the buildability and agility of the premise. It has to be just as easy if not easier to build, once it is much easier, it takes off.

3) Materials
John Fernandex, Building Technologies program of the Department of Architecture

As with all things, there is no reason to believe that material science will deliver new materials to architects and expect them to get used. The architects, material scientist, and engineers have to work together to meet specific needs. By recent collaboration new materials are being delivered that are co-designed and they are being used.

Investigation into Fabric Walls is ongoing in the program. There are many advantages to using fabric composites, such as weaving in of cables, delivering materials not in the standard 4x8 size, but instead in 8x300 rolls.

Fabrics can be deployed for emergency egress from building utilizing a fire resistant fabric to have an alternative means to escape from buildings. The material is rolled up inside of the building and deployed as needed from great heights to address disasters such as the WTC fires without a way to exit from above the fire.

A new Façade Lab is being creating on the frontage of one of the MIT buildings to allow for constant changes on the façade. The armature to hold the façade in place will be the only permanent piece and will allow multiple changes of façade materials for testing.

4) Persuasive Environments
Stephen Intille, Research Scientist, Department of Architecture/People

There is a health care crisis today. It stems from healthcare costing more to deliver, rationing of the care, and the inability to help people stay healthy longer and outside of the costly system. There is also an energy crisis today, the speaker asserts that they are linked together but does not elaborate.

The question the researcher is working on is: Can technology motivate behavior change in the home, workplace, and city? The research has so far led to Point of Decision Messaging is key and can be delivered through technology. Motivating behavior change can be accomplished by the message, the timing and placement of delivery.

A couple of examples to this, are the installation of a blue light on air conditioning controls to alert inhabitants know that it is cool enough outside to just open the windows and stay at the desired temperature. This simple light creates an 18% reduction in the amount of energy used by having people use the AC 15% less. (Not sure how the math works there. ☺)

A simple message displayed with a laser drawing on the floor in front of escalators changes the stair usage from a normal 4-7% to 8-14%. It clearly works. Sensors in the future would even allow the message to be targeted to special needs, or even personal devices so that messages are customized to a particular user.

The idea is simple, link advice with the activity and people start doing the right thing.

5) A Picture of Health
Brian Smith, Principal Investigator of Critical Computing

The researchers ideas are to change a person from "listening to the narrator" regarding their health to writing their own narration. By doing so, the person immediately becomes more involved and really learns the object and starts actively participating in the treatment.

An interesting though not relevant story was in regard to wanting to measure things and looking for visual representation. Diabetes has been recognized for thousands of years. The first glucose meter was invented in Egypt where one would urinate on an ant hill. If the ants came out to feed, then it would be known that the sugar was high and the person would need care of some sort.

6) Human Design
Sandy Pentland, Principal Investigator of Human Design

Within the Human Design research the primary focus is the interaction between human and computer. The research is around making sure that technology only enhances the core human values and expands human expressiveness.

One of the first things noted is that too many cameras or technology inputs and people began to feel like big brother is watching them. By moving the input devices onto a human then others accept them more readily. Gathering all information, all the time from a person means that the information is there when they go to the bathroom, when they are walking around… all the time. But that information is valuable even if it feels intrusive.

One of the more interesting projects revolved around children with diabetes. It is hard to teach children what affects their blood sugar, so a simple game utilizing glucose monitors and PDAs was developed for the kids. Essentially kids with diabetes associate with other children, by "betting" on their sugar levels they have an achievement to see who is closest. It becomes more interesting as they realize they can collect data to backup their bets, such as exercise, what they are eating and the like. After a while, the children can almost always accurately guess their sugar levels based upon their mastering their environment and the variables that affect it.

7) Lifelong Kindergarten
Mitchel Resnick, Principal Investigator of Lifelong Kindergarten

The idea behind the lifelong kindergarten is to recreate the way people bring forth their ideas. The ultimate goal is a world of playfully creative people, who are constantly inventing new possibilities for themselves and their communities. This happens most often by personalizing what is to be learned. Once learning is personal, it happens quickly and creatively.

In one example a young girl wanted to know what her gerbil did at night. Since the gerbil was never active during the daytime, she wanted to see what she could learn about the night time activities through data gathering. Utilizing Lego Mindstorm bricks, she was able to rig all the different pieces of the gerbil cage and capture movement information for the gerbil.

Another child wanted to keep track of how many miles she put on her rollerblades. Using technology made available to her, she was able to create an odometer for her rollerblades. Another young girl valued the privacy of her diary and created an alarm system for it. The learning came to the kids thanks to their intense interest in it. It is that enthusiasm that the Lifelong Kindergarten is trying to foster for kids of all ages to improve creativity.

8) Fabricating Rules
Larry Sass
9) Customizing Mass Housing: A Challenge to Design and Production
Jose Duarte
10) Design on Demand
Jarmo Suominen

One bit of the research is along the lines of the architect Pallido's (spelling?) rules of architecture. The architect had designed several houses throughout Portugal (I think that is right) that follow exacting rules while having different layouts and functions. The researcher is working on expanding the work and creating rules that can be interpreted by a computer program to create custom housing for people without requiring re-architecture. All three speakers are looking at different aspects of the same "fast" architecture.

11) Postal Service using TOWER & CRICKET
   Bakhtiar Mikhak

See previous write up.

12) The Agile Workplace
   Michael Joroff

Most employees do not think about what they do. When someone comes in to discuss designing new spaces for them, they often report back ideals such as, need to collaborate, or need privacy, or the like. The researchers are trying to really examine what employees do and design spaces around that. The researcher gave good summary points that I will just list out here.

Basic mindset to where the Agile Workplace is going:
1. Work is the fundamental to creating a workplace, it is NOT about creating a cool space
2. Workplace is a bundle of services, physical space, connectivity, etc.
3. Work is situated:
   a. Tools
   b. Places
   c. Culture
4. Work place is subject to continuous change
5. Agility is a mindset for the way work is managed, not just flexible physical space
6. Work is no longer place based, can be broadly distributed anywhere, anytime now

Purpose of the research:
1. evaluate the effectiveness of new technology when work place changes
2. improve the application of technology; unless the technology is fit into the culture of the place it will fail
3. apply technology from one place to another work place (ie: voice loop from black boxes could be used elsewhere such as conference rooms for quick playback)
4. really understand the work in order to come up with new suggestions for technology application
5. Look at three things in laboratories, must know the first:
   a. Oberservation
   b. Modeling
   c. Re-situation

13) Urban Narratives: Making the City Speak
   Gregory Beck, Researcher on Architecture + Experienced Design

Urban narratives are stories that enhance places. They are interpretation and not raw facts and data. Technology acts as a translator for the place to the interpretation to be passed along.

The 2002 demonstration project is the Boston Freedom Trail. The technology resides on a PDA and is more than a simple guidebook for the person following the trail along with their PDA. Eventually other urban laboratories will be created to continue the research. By using the PDA, several different narratives can be traced. Historical, commercial, current events, or even just location based information.

Some of the consequences of the urban narratives are as follows:
1. Increase visitor length of stay
2. Establishes a conversation among people, place, and culture
3. Impacts every level of commercial activity
   a. Urban infrastructure
   b. Retail
   c. Visitor industries
   d. Mobile electronics

14) Urban Narrative: Media in the City
   Dennis Frenchman

Continuing on with the Urban Narrative topic, we head to Seoul Korea which is having the Digital Media City added to it. DMC is a portion of the city that is being designed with all the latest in city design, but keeping the current Korean city environment in tact. For example, there will be a large pedestrian street running through the center of the area to allow the street vendors and markets to still be place, but now without competing with automobile traffic.

15) Glorianna Davenport
See previous write up.

16) David Cavallo
See previous write up.

IV. INDUSTRY PRESENTATIONS

There were two presentations from outside of the media lab. The first was from the CTO of Danger, Inc. and was an update on coming technology that they are offering. The second was from the director of the Network & Computing Infrastructure at Johnston & Johnston and has good input as to what other large corporations like AOL are doing to support their users.

1) Danger, Inc. (http://www.danger.com)
   Joe Britt, CTO & SVP of Software Development

Danger's goal is to create a $200 device that mimics what you'd get on a desktop PC but on a handheld device. Some of the key criteria to create the device was graphical HTML web browsing, computer-like instant messaging, email with attachments, and a phone. The model taken is a split application model. Both sides have some intelligence and that intelligence is based on what that particular side does best.

The end-user device is called The Hiptop and its function is to cache and present information to the user. There is no need to understand all Internet Protocols in order to achieve this. By taking this methodology it the Hiptop decreases memory,

processor, and network bandwidth needs. The unit is GPRS based.

The service side of the product offerings is where the profit will be made with ongoing usage charges. The Danger Service does all the heavy lifting and serves as a backup and access point for the user's data. The primary functions are:

- centralize knowledge of support standards
- optimize content conversion for the device
- manage device software revisions
- maintain a copy of all data on the user device
- gives user non-Hiptop access to their data through a web portal

Not really a thin client model, the data is still conveniently available for the user on their device, and applications that make sense are ran on the device itself. The device is Java based with a virtual machine to allow swap out of hardware as needed to grow and improve without re-writing all applications. The product has been in development for over two years and will be released the summer or fall of 2002.

The Hiptop itself is a very cool unit. The keyboard is hidden underneath the screen and exposed only when needed. The unit has the following current applications though more will come and an SDK will also be eventually released for user written apps.

- Web browser (uses real content, not mobile content)
- Email
- AIM (Yahoo, Jabber, IRC, coming as well)
- Phone (with hands free jack too)
- SMS
- Address book
- Calendar (iCal support)
- To Do List
- Notepad (cut & paste from web)
- Camera (plugs in through audio headset jack)
- Easy to write for… Java!
- Support Word files and pictures as attachments

The Danger team determined that there were three technology aspects that had to be most flexible and they were: CPU selections, display resolutions and bit depth, and the network selection (GPRS now, Bluetooth testing, more coming). Currently the unit has a 24mhz Arm7 CPU, 16mb RAM, and 4mb Flash and a GPRS radio. The unit gets 48 hours of standby time, 8-10 hours of continuous data transfer, and 2 hours of talk time. Currently the unit can not function as a GSM phone and GPRS for data at the same time.

The four area of concerns focused on in the marketing plan were: end user device cost, ability to use existing content, application development times, and the ability to easily evolve as technology changes.

2) Next Generation Collaborations & Applications
Stuart Kippelman, Corporate Director, Johnston & Johnston Networking and Computing Infrastructure
J&J's vision about data:

- More new information will be created over the next two years than throughout our entire history
- Medical science will not be possible without advanced computer solutions
- Instantaneous global communication is the worlds next killer app
- Research & development will become more reliant on academic partnerships than ever before

Thinks the common accepted growth rate of technology is totally off at 20-30%. Instead believes that the growth rate is 20-30 times year over year. That can be seen in relation to databases, computing power, etc. Technology is here to stay, there is no way to turn back to test tubes and previous ways of research.

J&J Research Areas:
- Knowledge
- Data
- Communication
- Media
- Grid Computing
- Academic Partnerships

When capturing information from a study of usage or the like, capturing non-verbal information would be key. If facial expression, body language and other forms of communication could be captured and categorized then products could be much more appealing in the end.

Grid computing isn't just relaying a little information back and forth. It needs to tell all the other like components as well so that they can all utilize new information.

Research Goals:
- Push the boundaries of technology and how we think about it!
- Focus on content first, then technology
- Solve J&J's toughest computing challenges
- Bridge the gap between J&J scientific research needs and the computing abilities it requires
- Central coordination point to further J&J objectives in relationships with academia
- Transfer research lessons and successes into production

Almost all J&J scientist are looking at things that cannot be delivered by today's technology. While the final portions may not be delivered for a while, baby steps are important and as much as work as is feasible should be released as quickly as possible.

Even though the work isn't about technology, eventually technology has to be touched. When technology does get involved, it is never simple stuff… but if it was simple, we'd be out of a job!

So what is wrong with the technology? It's not so advanced, because we have more ideas about what we want it to do, than what it can do. Technology vendors just don't get it. Cisco has tens of thousands of settings just to move

packets from place to another.

Technology is currently extremely complex. It takes a $100k a year employee to configure linux, when you can just pay Microsoft $30 and accomplish like functionality.

The J&J Networking & Computing Infrastructure team quickly realized that the office network isn't the place for research. As such J&J built a separate network for research activities. J&J joined Internet2 for collaboration with other researches as well as high speed interconnections between their own researches around the world.

The new Advanced Network is preparing for extreme J&J data needs in the future. Investigations into J&J data needs within the 2-10 year time frame are performed on the advanced network. It includes the generation, movement, storage, and archiving of data. There is a significant focus on bandwidth and latency. In the end the entire project is about making the bandwidth irrelevant.

Previously if there was a bandwidth or latency problem, an application just wouldn't work very well. New applications just refuse to work at all. Several of the J&J apps need a round trip time of less than 80ms to even function.

Internet2 consortium"
- effort to duplicate the successes of the original Internet
- members include: 185 universities, 50 corporations, 5 government agencies
- J&J focus is on partnerships first, technology second
- "It's the best computing laboratory and test bed in existence."
- J&J directly influences the coming architectures by participating in Internet2

Examples of Internet2 capability is within the download of the Matrix DVD:

171 hours over a 56k modem

74 hours over ISDN

25 hours over DSL/Cable

6.4 hours over T1

30 seconds over Internet2

(takes about 20 minutes from the IC office network, though new GIG firewalls will speed it up to the same as Internet2)

Grid Computing Research
- will power the vision of scientific computing in the future
- intelligent devices communicating with powerful processors, research instruments, and huge data archives
- all linked by super fast networks and advanced software
- grids will be as easy to use as the web
- grids will be as convenient as turning on your kitchen faucet to get water, you'll just get CPU power

Scientific Office of the Future:
- complete redefinition of how scientists work
- fully immersive experience
- allow advanced technology to be used in any space, not just dedicated ones like Telesuites
- vision and mechanism for testing research successes
- currently creating a prototype immersion cubical, walls are screens, cameras, full surround sound
- high speed network access

High Definition TV
- used a source of extreme amounts of data for research
- investigation as a scientific and marketing visualization tool
- upgrade of scientific instruments and future products to support output to HD
- upgrading collaboration spaces to support HD quality

Bandwidth Medical Lessons
- J&J highest LAN speed is 100mbs
- Digital radiology of the chest is 200MB
- Mammography is 1600MB
- MRI Study is 2000MB
- New 4D MRI is 80 Terra Bytes

V. Personal Comments

The visit to the MIT Media Lab was quite impressive. While there wasn't a lot directly applicable to AOL Internal Computing, there were several promising projects that could benefit AOL and AOLTW. If there are questions on specifics of any of the briefs that I have written up, please feel free to contact me through any of the contact methods listed on the front page.