Get A Life: Thinking Outside the Box

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At the moment of their creation, computational devices and software capture a "snapshot" of contemporary desires, philosophies, and paradigms. As the technology has developed and evolved over the last several decades, the historical detritus of embedded design and compromise has piled up underfoot like strata of fossilized bones. This is both a blessing and a curse. As Isaac Newton said, "If I have seen further it is by standing on the shoulders of Giants." On the other hand, the burdens and legacies of history often hinder fresh conceptualization and development.

China, Brazil, and other developing nations—only now getting around to building a technological infrastructure—can leapfrog over decades of our old baggage: today's state-of-the-art devices form the bedrock upon which their future will be built. For example, cell phones and pagers are penetrating these markets at a rate unknown in the United States, avoiding the need to lay vast copper grids. Users of the technology are more mobile, more digital, and more social than their counterparts in the Western world.

Visual story construction and social context

A recent visit to Thailand drove home the observation that the Thai people have a remarkable ability to appropriate technology and adapt it comfortably to their own social context. On our way to the night market in Lampang, the streets are filled with motor scooters, each carrying three or more young people. This affordable technology provides freedom of transport within the local community—especially for the youth, and particularly for women.

Multimedia is also being appropriated for social purposes. At the night market, a young woman uses a computer workstation with a video camera to capture personal, intimate portraits of her visitors. I watch as several young couples mime and mug for the camera, always to the amusement of onlookers. In fact, the engagement in this installation is threefold. All parties invest in a moment of camaraderie; the night market provides the framework for continuity and context.

Photographers and moviemakers are by nature a nomadic crowd. I'm in Thailand to teach my second annual workshop on digital photojournalism and storytelling as part of Project Lighthouse—a joint program between the MIT Media Lab's Learning and Epistemology Group and the Suksapattana Foundation. My goal: to explore how storytelling functions within a constructionist framework of learning. This proves a good match with the students' desire to explore digital self-expression. This time, I'm working with young teachers from the alternative school system and Mr. Dacho Buranabunpot, a highly regarded photographer favored by the Thai royal family.

Dacho runs a camera dealership in Bangkok and regularly travels to exotic and remote locations (with and without royalty) to fulfill his passion for capturing the majesty of light and form. Beyond his skillful and practiced eye, he also brings several Olympus digital cameras and the ability to communicate with the students in their own language.

On the first day of the workshop, we focus on the way in which light defines material shapes. Students practice by taking pictures of each other. As in life, photography is about selection. As we look at their portraits, we begin to share our interpretations of each photograph. As day one draws to a close, we discuss the subjects of larger stories that the students will follow and document: a mosque, a horseman, a fisherman, an elephant camp, and the making of an herbal shampoo.

The next day, each group goes off on a field trip to collect photographs for their story. I join

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the group going to the herbal farm. The place is remarkably lush compared to the surrounding landscape. As we arrive, several employees have begun preparing huge piles of herbs—they're stripping long stems of leaves, which they then grind in a large mortar. The man who built the business welcomes us. He explains his business and personal goals. I sense a story in the making.

The woman student who suggested this theme dominates the shooting; she and her comrades snap photos continuously. Clearly, this group enjoys taking each photograph. As they proceed, they gain a sense of how to frame the picture for the most interesting light. I have the sense that they're focusing on process. However, I don't realize until we return to the education center that no one took any so-called "establishing shots." That is, there were no portraits of people, the buildings, or the broader vista. Instead, the students took more than 200 beautiful close-ups: hands manipulating leaves, mushrooms drying, capsules being filled.

Working with and alongside the students, Dacho offers invaluable inspiration. Several of the student groups rise at 6 am to capture the most interesting light. At high noon, they're back at the education center reviewing their images. Sometimes they look over at those Dacho captured. "Where was that taken?" one student asks in awe, admiring the picture of a mosaic peacock, "I never saw it" (though they had been together in the same temple that morning).

Once the students return with their photographs, I encourage them to select their best eight that together tell a story. In the hours and days that follow, students work closely within their group, first struggling to articulate a model for their story, then to construct the presentation environment on the World Wide Web. For some students, the task of selection proves difficult and produces no small amount of anxiety. For others, the story layer generates added interest and commitment to capturing the necessary photographs. Interestingly, the herbal contingent is in no mood to edit. To them, each picture is precious—each functions as a memory on its own.

On the last day of the workshop, each group of students presents their final story crafted from a collection of frames. The story of the fisherman, made with the help of my research assistant Paul Nemirovsky, actually incorporates a surprising irony (see Figure 1). The herbal group has managed to put together something that resembles a public service announcement: a young man, stricken with a headache, takes some herbal capsules and recovers.

The herbal group's lead woman is angry. In an unusual show of emotion, she argues her case in Thai. She didn't understand that she would only be allowed to use eight pictures for her final presentation. Everyone was giving her group story ideas, and each idea changed their story. She has so many beautiful pictures which she ached to show but couldn't.

I'm wounded. I wonder at the complexity of the task. We tell stories all the time. It should be trivial to transition from verbal to visual stories. However, this is not the case. Learning to take better pictures is relatively easy—taking the picture involves direct action. Telling a story with pictures relates to language: a story requires the teller to articulate a model, to shape an associative framework that the audience will receive as the author intended. Mastering the technology is not enough. Storytelling requires deep knowledge and feeling for cultural forms and formats that can only be gained through repeated experiences of creating and consuming.

Moving toward more fertile ground

In a recent paper, "Thinking Like A Tree (and Other Forms of Ecological Thinking),"[1] Mitchell Resnick makes an analogy between distributed learning and the "walking tree" that can be found in the Costa Rica rain forests. The tree throws out roots from a meter or so above ground level—the roots act as an evaluation system, searching out good soil for the tree. If there's good soil on the

Figure 1. A Thai fisherman. In this story, the tellers focus on the ambiguities of the fisherman's belief systems. The pictures show the altar at which the fisherman worships Buddha before leaving for a day of fishing; the image of the King which hangs in a place of respect in the fisherman's house; a sign at the river bank that states "No fishing" (by order of the King); and the fisherman, with his very straight back, sitting and fishing at the river's edge.

north side of the tree, the roots on that side dig in deeply and hold firmly. If the soil on the south side isn't as good, the roots on that side remain shallow and weak. As the roots on the north side become stronger and deeper, the whole tree gradually shifts toward the north, pulled by the strong roots in that direction.

Resnick uses the walking tree to illustrate the way in which distributed systems work. To bring home the point, he asks a workshop group to solve an algebra problem using the random choice/evaluation method of the "walking tree." Resnick introduces an equation, the participants randomly choose a value that might solve the equation, and the participants evaluate the closeness of their guess. They identify the range of guesses that come closest to solving the equation and pick a new value within that range. The process continues until the participants solve the equation.

The "walking tree" suggests a model for learning that resonates with what might be best called social constructionism. Social constructionism recognizes the learning that occurs through inter-personal exchange as well as through personal construction of an object—be it a Lego creature, a story, or a song. While this method may not be the most efficient, it's interesting and conceptually revealing—well worth pursuing if the resources are available.

In recent years, many individual researchers have begged the broader community of computer users for their spare machine cycles. Those wishing to compute a longer encryption key or calculate the value of pi to a billion decimal places have split the task into smaller parts and distributed the effort across thousands of machines in far-flung locations. Similarly, the state of the art in computer chess-playing currently relies on brute-force methods—such as calculating every possible move on the board and reviewing the entire history of masters' games before deciding what to do next—which earlier artificial intelligence workers would have found abhorrently inelegant and shamefully wasteful. As computing power becomes cheaper, more highly distributed and ubiquitous computational efficiency becomes

Figure 2. "Berliner sehen." Developed by Ellen Crocker and Kurt Fendt, the project combines an extensive collection of shared media archives with Internet technology to create a collaborative learning environment for beginning and advanced-level language students.

less important than obtaining an interesting result. There's no reason why complex calculations must be performed entirely within a single box. Many compelling reasons exist why complex social interactions should be distributed among many communicating boxes—particularly when our personal computers are embedded in our clothing, our jewelry, and our bodies.

Designing for a social interaction: "Berliner sehen"

Like a good classic novel or a cutting political debate, multimedia content should and can generate rich interpersonal exchanges. "Berliner sehen"—a language-learning application developed by Kurt Fendt and Ellen Crocker at MIT—offers us glimpses of a model for this future experience (see (http://web.mit.edu/fll/www/projects/BerlinerSehen.html).

"Berliner sehen" tells a story of the city through the eyes and dialogs of six Berliners who meet as part of the production (see Figure 2, next page). The characters were initially selected based on the hypothesis that people of Berlin would reveal dif-

ferent cultural and social perspectives depending on which side of the Berlin Wall they had lived on.

German-language students begin by working with a shared collection of contemporary interviews and historical documents that depict Berlin's cultural, social, and political life. As students explore these video moments, the system keeps track of what they have seen and provides a facility for sorting through segments based on general attributes such as theme or character. Then, the students use these raw materials to construct mini-movies, which reflect their own thoughts and interests. Later, in class, the students share their constructed sequences and reflect on what they have seen in the material as they discuss certain culture-centric ideas such as "Kiez" (neighborhood).

This learning method emulates the walking tree approach. Students build a shared vocabulary as they blaze their own individual trails through the source material. When they come together in the classroom, they discover the range of possible interpretations. Then, they can return to the online material with fresh perspectives. The repeat-

ed acts of deconstruction and reconstruction of source materials, both individually and collectively, build a deeper and more complex understanding that the students can use to discern finer interpretations of the shared vocabulary of spoken language.

Conclusion

As we move toward a future of embedded, mobile computing, we (as a society of inventors) are rather like a walking tree—throwing out roots, finding fertile ground, moving now toward an intelligent computer, now toward social computing. Today, we can clearly see that we need the computer to serve as a socially responsible partner, able to manage our personal stuff with intelligent versioning and significant clustering, but also inviting us to join together in memorable adventures with people from other cultures who speak different languages.

In the future, fashion designers and architects will be as influential as engineers in shaping our journeys behind the looking glass. The stand-alone computer will be replaced by isolated, seemingly autonomous components distributed throughout the physical landscape—including our bodies. But-

tons and boutonnieres will serve multiple purposes: as clothing fasteners, image-capturers, displays, and messaging devices. The threads of your clothing, as well as those of your tablecloth, will channel personal perceptions and idiosyncratic memories throughout an invisibly interconnecting network, from one mind to another.

Social relationships and communication are central to this future world. The act of searching for information will be replaced by playful, adventurous discovery and sharing. Affordable, ubiquitous, ever-present communications devices will allow us to find and build a society of audience who will congregate, debate, and co-create in profound new ways—far beyond the meager marriage of telephony and the passive consumption of canned experiences common today.   **MM**

Reference

1. M. Resnick, "Thinking Like A Tree (and Other Forms of Ecological Thinking)," to be published in *Int'l J. of Computers for Mathematical Learning*, Kluwer Academic Publishers, Norwell, Mass., 1999.

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