IST Panel “On Creativity: A research perspective”
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Q: What makes a good research environment?
A: Creativity, Openness, Sociability

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A researcher by definition explores that which is not known. Researchers -- particularly those in academia -- build theoretical ships and sail forth into uncharted waters, optimistically searching for new knowledge which will in some way change civilization. Some bring back recognizable treasure, while others find less obvious booty (sometimes, the crew's education is the only tangible result of the trip); but, every voyage of discovery helps to flesh-out and improve our collective maps of past, present, and future worlds.

Any map of the future is by necessity a moving target. In an era of rapid technological advancement, change is continuous; to describe change is to describe an emergent shift in the perceptions, thought and sociology of a time. What sort of institution can support constant change as a generative virtue, without breaking down, clogging up, or going broke? In other words, what makes for a good, sustainable, and extensible research environment?

When the problem space is large, time and circumstance may bring together an interdisciplinary group which acts as a significant force for discovery, innovation, and change. The founding of my parent institution -- the Media Lab at the Massachusetts Institute of Technology -- is a good case in point. Largely through the visionary efforts of Jerome Wiesner and Nicholas Negroponte, an amazing team of luminaries was assembled under a single roof, including: Marvin Minsky and Seymour Papert, who together had founded MIT's Artificial Intelligence lab; the legendary filmmaker, Ricky Leacock, who had built MIT's internationally-recognized Film Section; Muriel Cooper, the noted graphic designer who had previously headed the MIT Press; Barry Vercoe, a composer who had founded the Electronic Music Studio at MIT; and Steve Benton, the holographic inventor who had for years served as a lead scientist in Edwin Land's Polaroid Corporation. Together with many talented younger faculty and students, these visionaries established and grew a new paradigm for inventing-and-learning

subcultures, based on a "hands on, heads in" approach and collaborative interdisciplinary projects.

The Media Lab was chartered to invent and creatively exploit new media for human well-being and individual satisfaction, without regard to present-day constraints. It continues to carry out its mission with internationally-famous aplomb. Since 1985, the Lab has grown at a steady pace and is now a 400-person operation (including some 280 graduate and undergraduate UROP students) with a $30 million annual research budget. Despite its growth, the Lab still has little by way of hierarchy. When new faculty are hired, they are encouraged to leave their past work behind, in order to redefine their ideas with a five-, ten-, or even fifteen-year horizon. The Lab's independent academic program -- the Media Arts and Sciences program -- enables faculty to select students for graduate studies and then hire them as Research Assistants. The atelier style of groups within the Lab insures that each faculty member can follow her research direction with passion in a highly entrepreneurial fashion.

Born in an era when most university research programs in the U.S. were funded by the government, the MIT Media Lab was a contrarian enterprise. From the outset, its founders sought industrial funding. As sponsorship grew, the faculty increasingly insisted on an "open knowledge" framework; this included barring proprietary technology from the Lab. Within five years, the Media Lab had established its beachhead as a center for pre-competitive research. Today, the Lab takes on very little directed research; all sponsors have access to intellectual property; companies who are arch-competitors frequently sit in on the same sponsorship meetings.

Research is driven by the mind-set as well as by the devices of the time. Researchers explore what is possible, within the context of what they would like to see happen and the society of which they are a part. Belief in the merits of technology fosters belief in access to technology -- at least, within a democratic framework. This, in turn, requires openness and the opportunity for constructionist learning. The open framework for knowledge and invention remains a hallmark of the Media Lab . This openness allows students to learn from each other and representatives from sponsor companies to learn from students. Good ideas spread, creating an ecological shift in thinking and a basket of related demonstrations from which sponsors can draw as they consider improvements to their product line. One such example is a field-sensing device first used in a cello designed for world-renowned cellist Yo-Yo Ma. This technology allowed Ma to "conduct" his accompaniment as he simultaneously played in live concerts. More recently, the same technology, which measures the human effect on electrical fields, was incorporated into NEC's Passenger Sensing System. This system distinguishes between a rear-facing or forward-facing baby, and signals an auto's airbag when -- and more importantly, when not -- to deploy, making it a potentially life-saving device for a baby traveling in the front seat of an automobile.

In the mid-1980's, computing was largely resident in mainframes; access to the technology was effectively gated by large academic and industrial institutions. Researchers who were privileged to "play" with the technology naturally longed to share this fun with a broader public. The advent of the workstation platform and predictions of ever more powerful, lower-cost machines sparked research interest in the development of tools and personalized applications for a consumer constituency. Digital video and audio on the desktop were watershed developments whose potential has yet to be fully realized. When the invention of the World Wide Web with its universal browser burst onto the scene in the early 1990's, it suggested that a future Knowledge Library would provide important content to a broad public. In the years that followed, the sociology of the WWW -- with its easy-to-construct code and flexible access -- transitioned from single-user experiences to communities of sharing and sub-cultures of interest; this created a vital scaling-up of the network.

Today, the research landscape is again shifting, this time incorporating new material inventions: together, electronic remote-sensing devices, tiny "wearable" computers, message transcoding devices, printable circuit boards, and "haptic" devices for input and display will result in an array of inexpensive, single-purpose computing devices which speak to the network. The role of the researcher is to embrace these inventions as part of the paradigm shift in communications and to discover means by which they can be applied to ideas that foster human well-being. In the coming years, we imagine the birth of very inexpensive, printed computing which will transform the third world and make e-markets ubiquitous. Likewise, we imagine vigorous experimentation in all forms of technological convergence art. In the next millennium the divide between artist and audience, creator and consumer, product designer and service provider will fade to insignificance as all participants, using open channels of communication, work together in the co-construction of meaning and experience.

Beyond all conscious predictions, as William Gibson observed, "the street finds its own uses for things." The Street is a lively research environment driven by the "hacker ethic:" some discoveries can only made through the extensive use, abuse, recombination, and creative repurposing of new technologies and the content that they carry.