

HOW TO USE THIS MAP

Foresight to Insight to Action

The *2007 Map of the Decade* is the first step in a process of using foresight to reveal insights that can lead to more effective action in the present. You can use it as a simple road map, pointing to signposts in a landscape that you can't afford to overlook. But you can also tap it much more deeply, using group processes to discover how your own organization—your strategies and your goals—will be shaped by the passage of the next ten years.

TAKE A FORESIGHT TOUR

This map organizes IFTF's research findings from the last year into six columns—six big shifts that seem to encapsulate everything else.

focus points
Crossing these columns, you'll find ten key perspectives—the big forecasts from this year's *Ten-Year Forecast*. These are the focal points of the map, the big stories that will give the decade its distinctive form. Many of these have indexes, drawn from factor analysis of survey data, that show how deeply the stories penetrate the culture today and where the cutting edge lies.

indexes
Waving across the map are dozens of smaller signal banners: the details that add up to the big stories in our forecasts. These are indicators, innovations, memes—they can link directly to some part of your strategy. Track several of them across the map to see what kind of story they tell together. Share the story with a colleague, a team, your whole organization.

BUILD YOUR OWN FORESIGHT

No map is ever complete. So add to it. The easiest way is to add signals. In a group or individually, use the columns and forecasts to organize your own intelligence about the future. Where do your most important internal forecasts fit in this bigger picture? What signals do they amplify?

CAPTURE INSIGHTS

Insight often emerges from juxtaposition. Circle three of the most important signals (or forecasts) on the map. What makes them important—especially when you put them together? The answer to this question is an insight. Capture as many of them as you can.

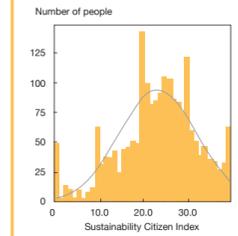
LINK TO ACTION

Ultimately you want to link your foresight and insight to action. What is the next step? It may simply be to collect more foresight. Or it may be to link specific signals to key indicators you need to track. Or it may be to translate an insight into an initiative. Try not to leave the map without jotting down at least one action step.

A PLANET AT RISK

As climate change, deterioration of the global food chain, uncertain energy supplies, and environmental health issues loom, ecological indicators will become key measures that organizations—and society as a whole—need to steer a strategic course through in the next decade.

SUSTAINABILITY BEHAVIORS



- Community health
- Personal care

CITIZENS OF SUSTAINABILITY
Personal self-interest will focus sustainability efforts on local communities

PEOPLE WITH DISABILITIES AS INNOVATORS

- More people survive with birth defects
- More chronic disease: from 43% of global disease burden to 60% by 2020



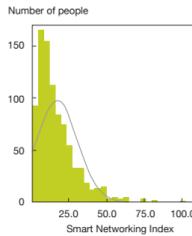
SLUMS AS INCUBATORS FOR INNOVATION

- Von Hippel: Lead users face needs that will become mainstream eventually

URBAN SQUATTERS AS LEAD USERS

- Alternative instruments for Muslim and non-Muslim populations

SMART NETWORKING



- Group participation
- Collective behavior
- Online lifestyle
- Mobile communication
- Locative activity
- Computer connectivity

who are smart networkers?

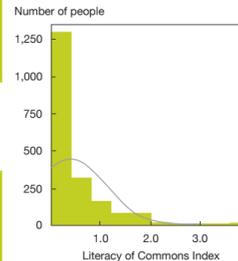
- Youth
- Slightly more men
- Slightly better educated
- No correlation to income

DIGITAL NATIVES, CIVIC SPACES

Youth media literacy will create a new civic culture

- Maintaining the commons
- Personal expression

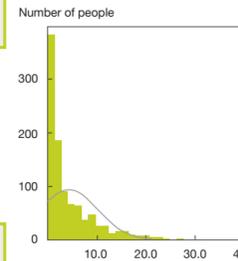
LITERACY OF THE COMMONS



SELF-INTEREST PLUS COLLECTIVE GOOD

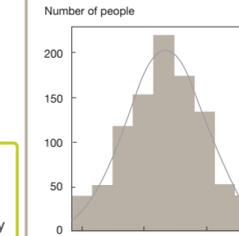
New commons behaviors, correlated with youth, may represent lead users—watch for the curve to grow more mainstream

A NEW SOCIABILITY



- Social-network development
- Social-identity creation

EXTENDED-SELF

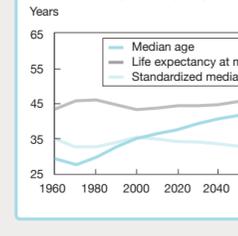


Transhumanist attitudes—the desire to be “better than human”—are normally distributed in U.S. population

ENGINEERED LIFESPANS

- De Grey's SENS:
 - Cell therapy
 - Somatic gene therapy
 - Somatic protein therapy
- Self-organized lifestyle
- Online sociability

GETTING YOUNGER



Life expectancy + median age yields a declining standardized “real age”

EXTREME LONGEVITY

Surprise—the population is getting younger!

CALORIC RESTRICTION

- Reduction of 20% takes 15 years off age of heart
- Caloric-restriction mimetic drugs

HUMAN-FUTURE INTERACTION

- A pattern language for:
 - Design tools and media formats
 - Strategic needs of users
 - Goals and insights of forecasters



SCIENCE REVOLUTION

Uncertainty will drive a new era of post-normal science

EXABYTES OF DATA

- One exabyte = half of all the information generated in 1999
- Number of exabytes of data in one year of phone calls worldwide: 17,000

EXPLAINING THE UNIVERSE

- Weak emergence: a consequence of physical and chemical actions
- Strong emergence: nonreducible to physical phenomena

EVOLUTIONARY DESIGN

James Martin: evolution can happen a billion times faster in a computer than in Nature

MARGINAL MAINSTREAMS

Marginalized populations—whether they are slum dwellers or citizens of economically disadvantaged countries or people with disabilities—will grow in number and influence over the next ten years, remaking mainstream culture as they work around apparent limits.

PARTICIPATORY CULTURE

Taking advantage of lightweight infrastructures—for everything from media to energy and fabrication—many more people will participate in the creation of the cultural fabric that defines who we are and how we will manage the dilemmas that face the world in the coming decade.

NEW COMMONS

Even as the Earth's natural commons are increasingly at risk, humans are creating new kinds of commons that can generate new wealth and sustain health and well-being in the face of these risks. From the Internet to bio-commons, they will provide new lessons in human social organization.

MOLECULAR VISION

Human ability to engineer at the molecular level, whether through biological, chemical, or electro-mechanical means, will grow over the next decade, changing not only the way we manage the world but actually transforming it to create new kinds of built environments—and new ways of living in them.

LOOKING LONG

The 21st century will test our abilities to grasp the future impacts of present choices, but even as we struggle to incorporate future knowledge into our day-to-day decisions, we're tuning up our bodies and minds and even our cultural frameworks for a much longer view of our personal and collective worlds.

RENEWABLE-FUEL STANDARDS

- 20% of energy portfolio in 20 states is renewable by 2020

ECOSERVICES OPTIMIZATION

- Ubiquitous environmental labeling

INTANGIBLE WEALTH GENERATION

- Investors get serious about alternative capitals:
 - Intellectual capital
 - Social capital
 - Natural capital

PERSONAL CARBON FOOTPRINTS

- Personal carbon credits

ECOSCIENCE + ECONOMICS

Climate change will drive effort to develop economic measures of ecosystem services

GLOBAL BURDEN OF DISEASE

- Leading causes:
 - Malnutrition
 - Poor water and sanitation
 - Unsafe sex
 - Tobacco
 - Occupational hazards
 - Hypertension
 - Physical inactivity
 - Illicit drugs
 - Air pollution

ONLINE ECO-RATING

- Environmental reputation tools

ENVIRONMENTAL REPUTATION TOOLS

- Bottom-up pollution geomapping

EARTH TRANSPARENCY PROJECT

- Integrated monitoring and reporting

FINANCIAL REFORM

New financial instruments will emerge to manage ecologies of risk

REURGENCE OF CLASS

- Class distinctions grow—and even gain favor—as people in growing economies express their newfound wealth

ECOLOGICAL-HEALTH LITERACY

- Two knowledge-based drivers:
 - Holistic models of health
 - DNA links to environmental impacts on health

GLOBAL POPULATION DISTRIBUTION



BRIC: 8 ZONES OF INSTABILITY

- Environment
- Infrastructure
- Employment
- Health
- The Generations
- Property
- Morality
- Identity

DIY INFRASTRUCTURE

- A patchwork of publicly and privately funded solutions—with lots of gaps in emerging economies

DETERMINANTS OF HEALTH RISKS

- Global population distribution
- Exposure to disease
- Poverty
- Lack of education
- Access to health care
- Armed conflict
- Population displacement

MICROFINANCE

- Muhammad Yunus: “End of poverty by 2030”

REGENERATIVE COMMERCE

- Brazil: Viva Favela
- India: FOOD
- Argentina: iPeople
- Mexico: Bioplaneta

SHIFTING BASIS OF AUTHORITY

- From expert authority to distributed trust

YOUTH MEDIA PRODUCTION

- Half of teens have produced online media

CHINESE BBS

- 43% of Chinese Internet users use BBS on a regular basis

CONSUMER COLLECTIVES

In China, online groups will redefine purchasing power

OPEN-SOURCE LICENSING

- Public domain license
- Creative Commons attribution license
- General public license
- Copyright license

OPEN ECONOMY EDUCATION

Open-source and cooperative strategies will transform public education

MOBILE LEARNING NETWORKS

- New learning agents proliferate
- Kenya: EPROM's mobile phone programming
- India: MSSRF's volunteer radio

RECIPROCAL ACCOUNTABILITY

David Brin: empowered with rights—speech, protest, petition, and recourse of law—people themselves will curb the nasty tendencies of human nature

PARTICIPATORY PANOPTICON

Portable connected media make privacy—and secrecy—things of the past

TECHNOLOGICAL CITIZENSHIP

- Democratization of science & innovation

USER-CREATED VIRTUAL WORLDS

- Second Life:
 - Active residents: 1.3 million
 - Monthly transactions: 6.2 million
 - Users with positive U.S. dollar flow: 21,000 +

BIO-TEAMING

- Beyond project management: bio-processes as guidelines, models

BIO-HACKING

- DIY molecular biology

NATURE AS CODE

- Biomimetics at three levels:
 - Materials
 - Structures
 - Processes

BIO-INSPIRED MATERIALS

- Eastgate Centre: ventilation inspired by termite mounds
- Plantation Place: ventilation inspired by human lungs

GREEN ARCHITECTURE

- Lotus-like self-cleaning coatings
- Synthetic gekko tape
- Diatom-like filtration systems

SWARMING MICROBOTS

- From a single expensive robot to multiple, very small robots

LAB-GROWN MEAT

- 3D prototyping
 - Inkjet printing
 - Laser sintering

DESIGN-BASED MANUFACTURING

- 3D printers + computerized design will trigger transformation of factories—and maybe desktops

DIY

Number of people

DIY Index

3D PROTOTYPING

- Inkjet printing
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TAUNGOU

- Chinese shopping collectives:
 - Employer-sponsored groups
 - Gated-community collectives
 - Ad hoc rural collectives
 - Retail service groups

NEW MOBILITIES

- Driving innovation and regional growth:
 - Physical
 - Residential
 - Social and economic
 - Virtual
 - Financial
 - Ephemeral

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PARTICIPATORY PANOPTICON

Portable

2007 MAP OF THE DECADE

THE FUTURE IS A PASSAGE THROUGH WORLDS WE'VE YET TO IMAGINE

The coming decade is the embarking. Spurred by unavoidable signs of a planet at risk, we begin to look for new ways of living, new ways of measuring and valuing the world around us. What was marginal begins to look mainstream, as people who have been tending the edges of our global culture demand our attention and capture our imaginations with unexpected templates for what is possible when the familiar order isn't quite so orderly.

Ours is an undertaking of a new generation. Where boomers "unplugged and tuned out," where they trekked to the backcountry to celebrate autonomy and the wild earth, the digital natives of the next generation are plugging into an urban wilderness where sociability is expressed not in rural communes but in the participatory panopticon, where commons are not green but rather virtual—and one's citizenship is measured in contributions to YouTube.

Setting out, we suspect that we are not so much traveling to a place that already exists but to a place we will create through the very process of getting there. If the social world is virtual, and if material is really just information, then nature itself becomes a code for building our common future. Looking long, we find ourselves preparing for a more extended stay on the planet, even as we face the possible extinction of our own species.

Looking long—that is perhaps what all the reorganization is about, the essential transformation of human ability to imagine further, act sooner. We can perhaps take a page from the ancient Tao Te Ching: "Have deep roots, a strong trunk. Live long by looking long."

INDEXING THE FUTURE | This year's *Ten-Year Forecast Signals Survey* offers up six indexes that map emerging behaviors and attitudes based on clusters of questions and responses. Index scores show us who are the lead users and what behaviors are already widely diffused.

SUSTAINABLE CITIZEN INDEX | Linking *personal health/well-being practices* and *community/environmental practices*, sustainable citizens are almost mainstream in U.S. culture.

SMART NETWORKING INDEX | Young, male, educated, and slightly liberal, smart networkers are mastering *group participation*, *online lifestyle*, *mobile communication*, *locative activity*, *computer connectivity*, and *collective behavior*.

COLLECTIVE BEHAVIOR INDEX | Combining *social-network development* and *social-identity creation* behaviors, lead practitioners of collective behavior cut across all political, religious, and income groups.

LITERACY OF THE COMMONS INDEX | An emerging literacy of the commons that links *online personal expression* to *maintaining* and *contributing to the commons* crosses gender, education, political, and income categories.

X-PEOPLE INDEX | Linking attitudes about *artificial bodies* and *transhumanist* values, X-People see the body as a platform for individual experimentation, augmentation, and intentional evolution—and they're nearly mainstream in the U.S. population.

DIY INDEX | Young, married, and Internet-savvy, do-it-yourselfers are *self-motivated*, *self-educated*, and *self-organized*, regardless of gender, race, religion, or political views.

PEOPLE

SUSTAINABLE CITIZENS LINK PERSONAL AND COMMUNITY HEALTH

As personal health becomes increasingly linked to community health, a new "sustainable citizen" will replace the so-called green consumer. These new citizens will still express their sustainability values in their purchases—for example, buying products that promise lower environmental impact as part of a healthy lifestyle—but they will also participate in projects to improve the overall health of the community to secure their own health. Local will be seen as healthier.

MARGINALIZED POPULATIONS GROW, INCUBATE INNOVATION

Worldwide, people in marginalized categories will grow in numbers and as a share of the population. Disabilities will increase as chronic disease grows from 43% of the global disease burden to 60% by 2020. By 2050, one-third of the world's population will live in urban slums. Outside mainstream institutions, these people will draw on new cooperative tools and technologies to emerge as a leading source of social and economic innovation.

YOUTH DRIVE CULTURAL PRODUCTION WITH NEW MEDIA

Having grown up with cell phones, SMS, and the Internet, the emerging generation of "Digital Natives" will define the new culture of participatory media—and adapt it to their personal needs as well as their professional lives. Their smart-networking skills will blend group skills and collective behavior with online lifestyles, and the result will be a rapid growth of cultural production that shifts authority away from many familiar gatekeeping institutions, including education, publishing, medicine, and advertising.

ONLINE COLLECTIVE BEHAVIOR DRIVES A NEW LITERACY OF THE COMMONS

As people build on their experiences with a variety of social software tools and Internet commons, four skills will define a new kind of sociability: social-network development, social-identity creation, maintaining a commons, and personal expression. These skills cross both the virtual and physical worlds, and taken together, begin to define a new kind of literacy for a new kind of commons.

SELF-INTEREST IS ALIGNED WITH COLLECTIVE GOOD

A fundamental principle of cooperative strategy is to link personal self-interest to the good of the larger community. As new technologies and a new sociability make this link more obvious across many domains—from health and environment to wealth generation, security, and even entertainment—expect a proliferation of new commons experiments and innovative solutions to old commons problems.

EXTENDED-SELF GOES MAINSTREAM

A host of attitudes toward the human body and its potential suggest that the transhumanist ethic—that humans should strive to be better than human—is becoming mainstream in the U.S. population. From physical extensions and replacements of body parts to cognitive enhancements, expect more people from every walk of life to push the boundaries of what it means to be human.

THE POPULATION GETS YOUNGER, NOT OLDER

As lifespans lengthen, many demographers and cultural analysts note that populations are effectively growing younger, as social and economic opportunities and expectations of midlife are extended later in life, and even childhood is extended: young adults are getting married later, having children later, and adopting the material symbols of adulthood later.

PRACTICES

ECO-MANAGEMENT PRACTICES AND REGULATIONS PROLIFERATE

In the face of disruptive effects from climate change, both communities and corporations will step up their efforts to manage the ecosystem more effectively, focusing on ecosystem services ranging from carbon sequestration to intangibles such as the value of viewpoints. They will look to science to provide more precise measures and targets, but in the end, they will also conform to increasing top-down regulation as states set standards for everything from renewable fuels to personal carbon-emission limits.

DIGITAL NATIVES DEFINE THE NEXT GENERATION OF CIVIC ENGAGEMENT

As the new youth media literacy emerges, watch for young people to apply more critical media skills to social and political issues. Their evolving literacy could catalyze new forms of civic action as networked publics, commons-based property regimes, and emergent self-organization increasingly bypass traditional government with ad hoc interventions and distributed solutions.

CHINESE FOCUS ON LOW-BANDWIDTH SOCIABILITY WITH BBS

While Web 2.0 sweeps the Western Internet, the Chinese will continue their love affair with bulletin board systems (BBS). Eschewing the "individualism" of blogs that express personal opinion, Chinese Internet users prefer the group orientation of the BBS forum—and the anonymity—which will give the Chinese Internet its own distinctive brand of consumer-generated media.

PARTICIPATORY PHILANTHROPY CHANGES THE WAY RESOURCES ARE ALLOCATED

Taking advantage of new economies of coordination, large and small donors are finding new ways to influence the flow of resources into communities on a large scale—and at the same time target their individual objectives. Pay special attention to the use of ecosystem targets to drive philanthropic giving.

DESIGN-BASED MANUFACTURING FOMENTS A FACTORY REVOLUTION

As rapid fabrication technologies like 3D inkjet printers and laser sintering move from prototyping to production, they will likely trigger a transformation in manufacturing. They will make factories more flexible, short-run, and responsive to rapidly shifting markets. More important, they may well unleash a vast wave of design innovation and ultimately move some forms of manufacturing to the desktop, where peer-to-peer exchanges of design are as common as music swapping is today.

DO-IT-YOURSELF MOVEMENT BUILDS ON GROWTH OF SOCIAL MEDIA

The do-it-yourself (DIY) movement that has led to a boom in the home-improvement industry, in home-made media, and in customizable products will likely grow as a self-motivated, self-educated, and self-organizing sector of society continues to define an alternative economy in self-made goods and services. This DIY population is skilled in online tools and gets high scores for online sociability—as well as high scores for sustainability attitudes and behaviors.

LONGER LIFESPANS FOSTER NEW INTEREST IN THE FUTURE

While the social and political effects of extreme longevity may not show up for decades, the expectation of longer lifespans may lead to fundamental shifts in the way people view the future—and risk, in particular. As people try to look further into the future and imagine life in a rapidly changing and uncertain context, a new discipline of human-future interaction (borrowing from the lessons of human-computer interaction) may provide urgently needed tools and practices.

MARKETS

ECO-MARKETS PROLIFERATE, TOO

Using the marketplace to manage ecosystem disturbances, many states, regions, countries, and even the international community will experiment with establishing eco-trading exchanges for carbon, water pollution, and air pollution. These exchanges will be plagued by uncertainties in how to value ecosystem services—how much is one acre of carbon-sequestering forest really worth?—as well as backlash from emerging economies who question both the exchange rates and the limits on their own development. The result? Eco-markets may be a short-lived phenomenon.

CARBON MARKETS GET PERSONAL

This decade will see carbon markets emerge as a means for managing personal "carbon footprints" and providing flexibility in the way individuals meet individual emission quotas, such as those already being set in the United Kingdom. In the United States, companies like TerraPass are selling personal carbon credits while real-time monitoring of environmental goods and services flows at the household, community, and regional level is anticipated within the decade.

FINANCIAL REFORM TACKLES TANGIBLE PRACTICES AND INTANGIBLE VALUE

The next decade is likely to see a host of financial reforms in response to natural and social crises that will create volatility in the financial community. Some of these will be innovations that extend existing financial practice such as microfinance or even Islamic finance, but many more will use multiple capitals—intellectual, social, and natural—to reduce the risk associated with uncertainty in the environment. These will be linked to growing corporate social responsibility requirements and increasing demands for transparency across both corporations and communities.

REGENERATIVE COMMERCE BUILDS ON INTANGIBLES, COOPERATIVE STRATEGIES

Coined by Jon Ramer, the term *regenerative commerce* refers to values-based commerce that integrates social networks and their values with transactional networks to retain and grow local wealth. Drawing on the Internet and other communication technologies to support these networks, emerging economies will develop local businesses and infrastructure using evolving cooperative strategies. See in particular the Viva Favela project in Rio de Janeiro and the Bioplaneta project of Oaxaca, Mexico.

CHINESE CONSUMERS PUSH THE ENVELOPE ON COLLECTIVE BUYING

Rooted in China's socialist legacy, urban consumer collectives—or *tuangou*—are creating a distinctly Chinese form of consumer culture. Organizing themselves into buying teams that leverage the power of the group, these collectives began in Internet chat rooms and range from ad hoc to highly planned BBS forums on commercial sites; over the next decade they will expand to a wide range of institutions and may ultimately reshape retail in the West as well.

OPEN-SOURCE BUILDS A VIRTUAL PLATFORM FOR BIOTECH

Just as the open-source movement has spurred rapid innovation in the software industry, open-source strategies for biotech innovation are targeting pharmaceutical innovation—in particular, to spur new cures for neglected diseases in the developing world and new business models and pathways for innovative drugs. Experiments with hybrid public-private collaborations are creating a new kind of virtual pharma commons, where open-source bio-info may make drug development more affordable and the public health system more responsive to global health emergencies.

ECOLOGIES

ECOLOGICAL LITERACY TRANSFORMS HEALTH STRATEGIES

Public views of health are moving away from the disease-centered biomedical model toward a more ecological view of health. This evolving perspective is supported by scientific evidence that where and how people live their lives can have as great an impact on health as genetics, health maintenance, and medical interventions. A language of eco-health literacy will emerge over the next decade to frame health concerns in these new terms.

GLOBAL BURDEN OF DISEASE GROWS

The global burden of disease will shift in scale and type over the next decade as traditional health issues of less developed countries—malnutrition and poor sanitation—mix with diseases of the developed world, including cancer and heart disease, to create paradoxes worldwide. Adding to this pattern will be border-crossing forces such as population migration, epidemics, and environmental hazards.

EMERGING ECONOMIES NAVIGATE ZONES OF INSTABILITY

While shaped by different forces, the top-four emerging economies are experiencing common zones of instability. Families in Brazil, Russia, India, and China (BRIC) face disruptions in their environment, infrastructure, employment, health, personal property, and identity, among others. As they navigate these instabilities, they will create new resources, resequence their lifestyles, tap a new learning economy, and adapt to a new level of mobility.

NEW MOBILITIES DRIVE—AND ARE DRIVEN BY—MOBILE TECHNOLOGIES

Mobility is a key driver not only of patterns in daily life but also of innovation and regional economic growth. Six dimensions of mobility—physical, residential, social and economic, virtual, financial, and ephemeral—will drive innovations in infrastructure, employment, migration, and even class structure over the next decade.

EDUCATION GETS A MAKEOVER IN THE OPEN ECONOMY

For over two decades, the public has debated how to "fix" the institutions of public K-12 education, but the open economy may remake education from the bottom up. The key drivers here are personalized and participatory pedagogy, media-rich pervasive learning, new learning agents, and new urban-wilderness lifestyles that focus learning on urban needs such as deteriorating infrastructures, poor health status, and growing diversity and uncertainty.

BIOMIMICRY YIELDS A NEW ECOLOGY OF MATERIALS, MACHINES, AND PROCESSES

As bioengineering takes root in the world of R&D, biomimicry will provide a basic strategy for creating new materials that imitate molecular structures in plants and animals; new designs for propulsion systems, bridges and robots based on natural structures; and new processes for maintaining stable environments, growing food, or even designing team processes in organizations. The challenge over the next decade will be making the biomimicry knowledge base more systematic and accessible to engineers and entrepreneurs.

NEW SOCIABILITY CREATES EXABYTE ECOLOGIES OF DATA

Science is all about data, and the volume of new scientific data has been growing by petabytes per year (a very big number). Still these numbers pale by comparison to the human exchange of information through e-mail and telephone (measured in even greater exabytes)—and these interactive media may more closely resemble the future of scientific machine-to-machine communication. The result? This new sociability of machines may fundamentally change the way knowledge is created and verified.

TOOLS

ECO-TOOLS BUILD ON BOTTOM-UP CONTEXT AWARENESS

A host of new scientific and social practices—using sensor networks, bottom-up environmental monitoring, collaborative pollution mapping, and nested environmental models—will create a rapidly growing awareness of our environment. This "green panopticon" may ultimately lead to a kind of "planetary mark-up language" not unlike the Web's HTML, which will facilitate global communication about the state of the planet.

HEALTH MAPPING TOOLS TRACK HEALTH RISKS

Similarly, both bottom-up and top-down tools should lead to a more integrated view of global and local health risks—including global population distribution, exposure to disease, poverty, education, access to health care, armed conflict, and population displacement. These new views will almost certainly spur innovations in both public health initiatives and marketplace offerings.

DO-IT-YOURSELF INFRASTRUCTURES CREATE OPPORTUNITIES AND GAPS

As lightweight infrastructure components for communications, water, power, and transportation diffuse in the developing world, a variety of strategies will emerge for local, small-scale implementation—from regenerative commerce strategies that emphasize new commons to private investment that looks more like traditional chambers of commerce. Both will create opportunities for local and global entrepreneurs, but will also leave gaps that will not only deny access to some, but also require adaptable strategies by those who want to use the infrastructures for their own enterprises.

A PARTICIPATORY PANOPTICON CREATES MOBILE RECORDS OF EVERYTHING

As camera phones, webcams, and other mobile network devices provide an early manifestation of the "participatory panopticon," a growing number of so-called mobile network virtual operators (MNVOs) that repackage and resell bandwidth will put an emphasis on data, video, and network connectivity, aimed at younger markets. These tools will redefine privacy as they watch from below, watch health and reputation, and watch the watchmen.

USER-CREATED WORLDS ARE LAYERED WITH NEW MEANING AND VALUE

Even as the mainstream media swarms to document life in Second Life, perhaps the most interesting thing about user-created worlds is that they are user-created. They are effectively creative commons where individual contributions add up to something that's more than the sum of the parts. Pay special attention to the growing articulation of creative tools and practices within these virtual spaces—especially the in-world creation of media to provide entertainment and education for in-world users by documenting the world that those same users are creating. Very recursive.

EVOLUTIONARY-DESIGN TOOLS POINT TO NEW WAYS OF KNOWING—AND PERHAPS NOT KNOWING

Evolutionary-design tools, which began as a technique for finding optimal solutions to engineering and computer programming problems, will be applied to a growing range of design problems from integrated circuits to complex machines that take advantage of their own characteristics—thermoplasticity or artificial neurons, for example—to evolve more efficient means of self-construction. Such designs will often work even though humans can't understand why, leading to a growing gap between our evolving technology and our knowledge of how it works.