E.I.T. Links

From "self-service" to "room service":
How Emerging Information Technologies are changing the way we live

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"Technology is the knack of so arranging the world that we don't have to experience it."
– Max Frisch

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Links for this Issue

AI General

- **The Most Ambitious Artificial Intelligence Project In The World Has Been Operating In Near Secrecy For 30 Years** – Cycorp's goal is to codify general human knowledge and common sense so that computers might make use of it. Cycorp's product, Cyc, isn't "programmed" in the conventional sense. It's much more accurate to say it's being "taught." Lenat told us that most people think of computer programs as "procedural, [like] a flowchart," but building Cyc is "much more like educating a child." (NOTE: I have long followed developments in Cyc and seen extremely impressive demonstrations of the program.)

- **Machines Finally Match Monkeys in Key Image-Recognition Test** – There are so many ways that humans are still superior to machines. Though computerized brains can beat humans at things like chess and *Jeopardy*, they can't always make out an Irish brogue or figure out whether a fly is inside or outside of a glass—just to name two uniquely human talents. However, the age of unchallenged human supremacy may be drawing to a close. According to new research from scientists at the Massachusetts Institute of Technology, computers powered by the latest "deep learning" algorithms are catching up.

Brain

- **Color-coded 3D brain map comes to life in video** – The Connectome Group's map comes to life in a recent National Geographic video. It doesn't resolve the great unanswered questions, but the 'wiring diagram' shows the complexity of the mammalian brain in a way that anyone can understand. If there are any neurons that specialize in detecting coolness, they will surely fire when watching this video.

Data Mining/Business Intelligence

- [Hospitals Are Mining Patients' Credit Card Data to Predict Who Will Get Sick](#) – Carolinas HealthCare, which runs more than 900 care centers, including hospitals, nursing homes, doctors' offices, and surgical centers, has begun plugging consumer data on 2 million people into algorithms designed to identify high-risk patients so that doctors can intervene before they get sick. The company purchases the data from brokers who cull public records, store loyalty program transactions, and credit card purchases.

- [Can Technology Fix Medicine?](#) – After decades as a technological laggard, medicine has entered its data age. Mobile technologies, sensors, genome sequencing, and advances in analytic software now make it possible to capture vast amounts of information about our individual makeup and the environment around us. The sum of this information could transform medicine, turning a field aimed at treating the average patient into one that's customized to each person while shifting more control and responsibility from doctors to patients.

Future

- [A history of the future in 100 objects](#) – Introduction to a new book, "There are still 18 years until the end of the century, and it may seem foolhardy for a mere human to attempt to analyse the data at our disposal. After all, we're awash with information from every corner of the world, covering every second of the century. A thousand detailed histories of individuals and systems can be generated at the snap of a finger. And yet I believe that our century, as it draws to a close, demands not that we look at just the big picture but at the small details, on the scale at which human lives are lived. This has been an extraordinary epoch in the story of humanity."

- [Anticipating 2025: A guide to the radical changes that may lie ahead, whether or not we're ready](#) – From mid 2014 until 2025, there will be seven 18-month "Moore's Law" generations, potentially resulting in a 128-fold increase in raw computing performance (that's 2 multiplied by itself 7 times). That will enable devices with core components that are, for example, 5 times more powerful, 5 times cheaper, and 5 times smaller (hence requiring 5 times less energy input) than today's computers. Over the same time period, we can expect similarly striking progress in cloud computing, big data analytics, robotics, synthetic biology, renewable energy systems, 3D printing, artificial intelligence, and many other fields. Collectively, these changes will enable huge transformation in very many areas of work, play, learning, and healthcare – as well as in our social and economic structures. The potential upsides are enormous. There are potential enormous downsides too.

Innovation

- [Tiny Flying Robots Are Being Built To Pollinate Crops Instead Of Real Bees](#) – Last year, Harvard University researchers led by engineering professor Robert Wood introduced the first RoboBees, bee-size robots with the ability to lift off the ground and hover midair when tethered to a power supply. The researchers believe that as soon as 10 years from now these RoboBees could artificially pollinate a field of crops, a critical development if the commercial pollination industry cannot recover from severe yearly losses over the past decade.

- [Adaptive Material Could Cut the Cost of Solar in Half](#) – A material with optical properties that change to help it capture more incoming sunlight could cut the cost of solar power in half. The adaptive material greatly reduces the cost of a tracking system used in some types of solar power. It changes its reflectivity in response to heat from concentrated sunlight in a way that makes it possible capture light coming in at different angles throughout the day.

Knowledge Management

- [The Watson Mobile Developer Challenge](#) – IBM is promoting a contest to allow for applications of Watson to be developed. The finalists of the first competition have

been announced.

- [IBM Introduces Watson to Consumers in Service for USAA Clients](#) – On the website of financial-services firm USAA, military customers will be able to use IBM's tool to ask questions and seek advice on transitioning back to civilian life. Famous for being a "Jeopardy!" game-show champion, Watson analyzes information and can answer questions in conversational English. IBM and USAA, based in San Antonio, worked for about nine months to develop the tool to answer questions specific to customers leaving the military, like whether to seek out veteran's benefits or how to buy a home.

Machine Learning

- [The AI Startup Google Should Probably Snatch Up Fast](#) – Clarifai specializes in using deep learning algorithms for visual search. In short, it's building software that will help you find photos—whether they're on your mobile phone, a dating website, or on a corporate network—and it will sell this software to all sorts of other companies that want to roll it into their own online services.

- [Microsoft Research demos Project Adam machine-learning object-recognition software](#) – Microsoft Research introduced "Project Adam" AI machine-learning object recognition software at its 2014 Microsoft Research Faculty Summit. The goal of Project Adam is to enable software to visually recognize any object — an ambitious project, given the immense neural network in human brains that makes those kinds of associations possible through trillions of connections.

Manufacturing

- [3D-printed ring reads out text in real-time for the blind](#) -- A team from MIT's Media Lab has developed a 3D-printed device worn like a ring that reads out any text it is scanned across. The team says it can translate text from books, computers and things like restaurant menus and newspapers, but is not yet adept at reading direct from touchscreen mobile devices (as

the finger moves across the screen, the text will move, rendering it untrackable for the tool).

Medical

- [Bio-printing transplantable tissues and organs is now a step closer](#) – Scientists from the Universities of Sydney, Harvard, Stanford, and MIT have bio-printed artificial vascular networks mimicking the body's circulatory system. These networks are necessary for growing large complex transplantable tissues and organs for people affected by major diseases and trauma injuries.

- [What Else Could Smart Contact Lenses Do?](#) – Google and Novartis announced that they're teaming up to develop contact lenses that monitor glucose levels and automatically adjust their focus. But these could be just the start of a clever new product category. From cancer detection and drug delivery to reality augmentation and night vision, our eyes offer unique opportunities for both health monitoring and enhancement.

- [Ultrasonic imaging at 1,000 times times higher resolution](#) – A next-generation ultrasonic imaging system that could provide 1,000 times higher resolution than today's medical ultrasound systems has been demonstrated by Lawrence Berkeley National Laboratory (Berkeley Lab) researchers.

Military

- [The future of warfare: self-healing aircraft and 'transformer' plane that can split into three jets mid-air](#) – Warfare is set to get more advanced with 3D-printed drones, self-healing aircraft and a 'Transformer' aircraft that can split apart, which could be in use within 30 years. The company believes the technologies could create "the ultimate adaptable taskforce" and the team is currently working with the government, leading aviation experts from universities as well as other companies to explore what the future of aircraft engineering may be.

- [Autonomous vehicles to join the US Army](#) – Over the next quarter of a century, the US Pentagon sees robots becoming more and more a part of military life with robot warplanes, submersibles, and infantry vehicles taking their place on the battlefields of the future. It may conjure up a very flashy vision of Transformer-like killing machines, but the US Army sees the first robots as autonomous vehicles used in the more prosaic task of delivering groceries and other supplies.

MISC

- [How today's technology is rapidly catching up to Star Trek](#) – Several technology developments are mirroring creative technologies used in the Star Trek series.

- [100% Renewable Electricity Will Be Achieved In German State Soon](#) -- Germany's windiest area, Schleswig-Holstein, will probably achieve "100% renewable electricity" sometime this year. That is, its clean energy production will be able to supply all of its electricity consumption. Schleswig-Holstein has a goal to generate 300% of its electricity consumption with renewables eventually. This mostly rural area is grid-connected, so it can sell excess electricity and still use conventional power during periods when wind is not available.

- [New chip-chemistry process could help extend Moore's Law](#) – An Intel-Lawrence Berkeley National Lab (Berkeley Lab) collaboration has found a new way to create smaller features for future generations of microprocessors by modifying the chemistry of photoresists, which are used to generate the patterns on a chip. The researchers believe their results could be easily incorporated by companies that make resist, and could be incorporated into manufacturing lines as early as 2017.

Robots

- [Ready for Robots?](#) – Robot capabilities are improving rapidly, making robots a viable option for different kinds of businesses.

Included in this article are seven categories that IT leaders should explore.

- [Robots' Best Teachers Are Other Robots (in Cloud Networks)](#) – The phenomenon of robots teaching one another is known as transfer learning, and it could prove increasingly useful as more people begin to rely on robots for medical care and other services. A robot facing a row of unfamiliar objects could locate the one it needs, check with the cloud about the best strategy for grasping it, and pick it up even if it hadn't been trained to do so directly.

- [These Tiny Robots Are Powered by Living Tissue](#) – Biots—biological robots -- use real muscle tissue to walk or crawl. While they've been created in the lab, today's biobots are currently little more than strips of muscle that inch across surfaces like caterpillars. But researchers predict machines guided by primitive artificial brains of their own, machines that could one day travel inside the body to conduct minimally invasive surgery or even venture out into the world to clean up pollution.

- [Sending Robots To Print Infrastructure On Mars, So It's Ready When We Get There](#) – A two-year NASA grant is funding the creation of robots that will build landing pads, hangars, and roads in space before humans get there.

Sensors

- [Mobile Gadgets That Connect to Wi-Fi without a Battery](#) – A new breed of mobile wireless device lacks a battery or other energy storage, but it can still send data over Wi-Fi. These prototype gadgets, developed by researchers at the University of Washington, get all the power they need by making use of the Wi-Fi, TV, radio, and cellular signals that are already in the air.

Virtual/Augmented Reality

- [Will Virtual Reality Reshape Documentary Journalism?](#) – Facebook's acquisition of Oculus VR in March 2014 for $4 billion brought a resurgence of interest in virtual

reality to the mainstream, almost 30 years after the technology first entered the public consciousness. And while Oculus VR's initial focus has been on video games, Mark Zuckerberg, Facebook's CEO, has described the hardware as "the next major computing platform that will come after mobile." Virtual reality can offer a novel, compelling way to communicate and inform

Wearable Computers

- Cyborgs Among Us: Human 'Biohackers' Embed Chips In Their Bodies – In tattoo parlors and basements around the world, people are turning themselves into cyborgs by embedding magnets and computer chips directly into their bodies. They call themselves biohackers, cyborgs and grinders. With each piece of technology they put beneath their skin, they are exploring the boundaries — and the implications — of fusing man and machine.