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HEALTH INDUSTRY | OCTOBER 17, 2011

# And the Rest of the Winners Are...

From computing systems to wireless, the most innovative technologies by category

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By MICHAEL TOTTY AND SHIRLEY S. WANG

### 2011 Winners

- Gold: Cellular Dynamics International Makes Heart Cells—Billions of Them
- Silver: Joule Unlimited Forges a Faster Path to Biofuels
- Bronze: IBM's Watson Adds Innovation Award to Quiz-Show Win
- Read the complete report .

The Innovation Awards judges chose winners in 16 categories this year. Here's a look at the winning entries.

### Computing Systems and Storage

[International Business Machines Corp.](#) of Armonk, N.Y., the overall Bronze winner, took first place in this category.

### Runners-up:

SeaMicro Inc., U.S.: A line of computer servers that use a quarter of the power of traditional servers.

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single computer, with centralized data management and quick start-up.

### Consumer Electronics

E Ink Holdings Inc. of Cambridge, Mass., whose pioneering electronic-paper technology is used in Amazon.com Inc.'s Kindle and Barnes & Noble Inc.'s Nook e-readers, won in this category for a new color e-paper display called Triton.

Triton delivers color images using a thin filter over a standard black-and-white e-



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### French Banks Fought Oversight

Among the factors responsible for the European banking crisis has been the persistent unwillingness of bankers and regulators to acknowledge they had a problem. That was particularly true in France.



### Fed Is Poised for More Easing

### M.B.A.s Seek to Occupy Wall Street

Financial-services industry hiring at the big Master of Business Administration programs hit a post financial-crisis high this year.



### Thailand Takes a Risk to Ease Flood



Hanvon Technology

ink display. The filter consists of arrays that are capable of producing nearly 4,100 different color shades, including 16 shades of gray. Like the company's black-and-white screens, the new technology consumes very little power. The images also are readable in direct sunlight without the glare of back-lit liquid-crystal display screens used in tablets such as Apple Inc.'s iPad.

E Ink's color display for e-readers

The first product featuring the display, an e-reader to be built by Chinese device-maker Hanvon Technology Co., is expected to ship this month.

### Energy

The overall Silver award winner, Joule Unlimited Technologies Inc. of Cambridge, Mass., placed first in the energy category.



Agilyx

Agilyx's plastic-to-crude-oil technology at work

Runners-up:

Agilyx, U.S.: A system for converting mixed plastic waste into a synthetic crude oil.

Echogen Power Systems Inc., U.S.: A system that converts industrial waste heat into electricity using supercritical carbon dioxide—which has properties of both a liquid and a gas—to power turbines.

Idaho National Laboratory, U.S.: A device that more accurately monitors the health of energy-storage batteries.

### Environment

Heat-reflecting windows let in light without straining air conditioning. The top prize in this category went to the Industrial Technology Research Institute of Taiwan, or ITRI, for a spray insulation coating that can be applied to glass windows and other materials at a much lower cost than existing techniques.

ITRI's Spray-IT uses a tin-dioxide material laced with minute amounts of lithium and fluorine that can be sprayed on glass or building tiles. The material is less costly than the silver-based films that are commonly used in reflective materials, ITRI says, and can be applied without specialized equipment. The ability to use regular spraying methods means the product can be used on existing structures.

Runners-up:

CertainTeed Corp., U.S.: Gypsum wallboard that can improve indoor air quality by permanently capturing formaldehydes and other volatile organic compounds.

TaKaDu, Israel: A Web-based software service for monitoring water-utility pipelines for

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leaks and breaks.

## Health-Care IT

The winner in this category, [Novartis](#) AG's SMS for Life project, uses a relatively low-tech tool—the cellphone text message—to fix a big problem in the health-care system in remote African communities: tracking medical supplies to make sure they get to patients who need them.



Novartis

Novartis' SMS for Life tracks medical supplies to make sure they go to patients who need them

Jim Barrington, the former chief information officer at the Swiss drug maker who now runs SMS for Life full time, recalls watching a video four years ago about children in Africa dying of malaria despite available treatments. The problem was that remote clinics often ran out of malaria medicine because central health facilities had no way of keeping track of how much supply the clinics had.

Mr. Barrington's team—which includes Novartis, [Google Inc.](#), [Vodafone Group](#)

PLC, IBM, the Roll Back Malaria Partnership and the Tanzanian government—turned to cellphones, which are available even in remote areas of Africa, to solve the problem.

Now, rural clinics once a week send a text message listing the amount of medicine they have in stock to health officials at central distribution sites. The information is displayed on a Google map, so officials can see which clinics are running low on supply—a flashing red dot—versus those that still have plenty of medicine, and schedule deliveries accordingly. The service is already used in Tanzania and is in pilot testing in Ghana and Kenya.

Runner-up:

[Hewlett-Packard Co.](#), U.S., and mPedigree Network, Ghana: A free text-messaging service that enables users to verify the authenticity of malaria medication and detect counterfeit drugs.

## Information Security

Mykonos Software Inc. won in this category for a website-security product that lures in hackers, tags and profiles them and then blocks all of their future break-in attempts.

After detecting a potential attack, the system lures the hacker into a "honey pot"—a trap that delivers false information, such as a list of bogus passwords, without compromising the secure parts of the site. The system then puts attackers through an increasingly complex set of "hoops and hurdles" to test their skill level and to determine appropriate responses. Finally, the system tags attackers so that it can detect any future attempts to break into the website, even if the hackers modify their tactics. That, the Burlingame, Calif., company says, is what makes its approach superior to other antihacking firewalls.

## Manufacturing Technology

Equipos Inc. of Los Angeles won in the manufacturing category for a mechanical arm that holds tools, parts and other objects, allowing factory workers to move the objects freely as if they were weightless.

Unlike other mechanical manufacturing aids, the zeroG arm doesn't require motors or hydraulics. Instead, it uses a spring to maintain a constant force. The device also uses a patented system of gimbals—a set of pivoting rings—that make it possible to rotate the tool in any



Equipois

Equipois' mechanical arms allows factory workers to move objects freely as if they were weightless

direction and hold it at any angle.

The arm was developed by Garrett Brown, who also created the Steadicam—a mount for stabilizing motion-picture cameras. Honda Motor Co. asked Mr.

Brown to adapt the technology for the assembly line. The arm is now being used by manufacturers such as General Electric Co. and Boeing Co., as well as by the U.S. military.

### *Materials and Other Base Technologies*

The Industrial Technology Research Institute of Taiwan earned top honors in this category for a reusable and recyclable electronic paper that can take the place of regular office printer paper.

ITRI says not only is its i2R e-paper less expensive than the costly rewritable printer products currently available, but also the cost could be comparable to that of conventional black-and-white inkjet or laser printing.

The i2R e-paper uses a special type of liquid-crystal technology to display text and other images on a bendable, thin plastic sheet. To print a document, the sheets are run through a simple device, similar to an old-style thermal fax machine, that heats the liquid-crystal layer, turning molecules light or dark. ITRI estimates that a single sheet could be reused 260 times before it would need to be replaced.

ITRI, a nonprofit research center, says it has licensed the i2R technology to Taiwan's ChangChun Plastics Co., which plans to begin pilot production of an e-paper product next year.

Runner-up:

Amyris Inc., U.S.: Genetically engineered micro-organisms that can convert plant sugars into hydrocarbons to produce a variety of chemicals and fuels, including lubricants and biodiesel.

### *Medical Devices*

Drug-coated stents—tiny metal scaffolds that prop open arteries—treat blocked coronary arteries by allowing blood flow to occur. But once a metal stent is implanted it remains there permanently, and the risk of blood clots remains.



Abbott Laboratories

Abbott Laboratories' stent

[Abbott Laboratories](#) of Abbott Park, Ill., took top honors in the medical-devices category for developing a stent that is reabsorbed into the vessel once it's no longer needed. The stent allows the vessel to return to its natural state, potentially reducing the risk of blood clots.

The company received approval this year to launch the stent in Europe and is aiming to get U.S. Food and Drug Administration approval in 2015.

Runners-up:

Columbia University and Claros Diagnostics Inc., U.S.: A low-cost hand-held device that can diagnose multiple infectious diseases from a drop of a patient's blood. It is designed to be used in poor and remote parts of the world.

Philips Healthcare, a unit of [Philips Electronics NV](#), U.S./Netherlands: A whole-body imaging system that combines both positron emission tomography, or PET, and magnetic resonance imaging in a single system.

### *Medicine-Biotech*

Cellular Dynamics International of Madison, Wis., winner of the overall Gold award, took top honors in the medicine-biotech category.

Runners-up:

Complete Genomics Inc., U.S.: A human-genome sequencing technology that combines DNA analysis and advanced informatics and data storage, promising high-quality sequencing at a relatively low cost for biological research.

Life Technologies Corp. and Dr. Jonathan Rothberg, U.S.: The Ion Personal Genome Machine, which promises to sequence DNA more quickly and at a lower cost than other sequencing technologies.

### *Network and Internet Technologies*

CloudFlare Inc. of San Francisco earned top honors in this category with a service that helps secure and speed up the performance of websites.

CloudFlare sits between a website's hosting service and a visitor's computer, sending traffic through its own network of data centers around the globe. Its security feature automatically detects threats from excessive spam, surveillance from malicious programs known as "bots" and denial-of-service attacks; all sites that use CloudFlare are then protected if the threat reappears.

Threat-detection systems can slow down Internet page loading because they add an extra layer between a website and its visitors. CloudFlare's developers, however, refined the code running its systems so that most pages load as much as 40% faster.

The LulzSec hacker group, which used CloudFlare's service to protect a website where it boasted of its exploits, praised CloudFlare after the service successfully fended off a barrage of attacks designed to bring down the site.

### *Robotics*

The winner in this category is the PR2 personal robot created by Willow Garage Inc., a Menlo Park, Calif., think tank, to help researchers develop and test new robotics technologies.



Willow Garage

Willow Garage's PR2 robot

The PR2 isn't the household helper depicted in science fiction. Instead, it's a powerful and sophisticated machine with a host of built-in capabilities that researchers can use to explore new applications. The 450-pound machine can roll around, visually survey its surroundings and identify objects. It has an extendable spine that raises and lowers its torso, and grippers that can grasp objects without damaging them.

Willow Garage, founded by former Google software architect Scott Hassan, donated 11 PR2 robots to research institutions, and is selling additional machines for as much as \$400,000 each.

Runner-up:

Neato Robotics, U.S.: A domestic robot that uses lasers to survey and map all the objects in a room and artificial intelligence to learn about its surroundings, plan its actions and respond to unexpected circumstances.

## *Semiconductors*

[Intel](#) Corp. took top honors in this category for a three-dimensional transistor design that makes it possible to build a smaller semiconductor, while improving performance and reducing energy consumption.

The Santa Clara, Calif.-based chip giant expects to start turning out processors with the new technology by the end of the year, making it the first 3-D transistor design to go into large-scale production. The technology will be used in Intel's next-generation chips, called Ivy Bridge, which may start appearing in devices next year.

The 3-D transistor design, known as Tri-Gate, features a thin silicon "fin" that rises vertically from the base. Current through the transistor is controlled by gates on each side and along the top of the fin, whereas the existing two-dimensional transistors have only one gate.

The extra gates provide increased control over current through the transistor, Intel says, allowing it to deliver up to 37% better performance, while cutting power use by half.

The Ivy Bridge processor can squeeze more than six million Tri-Gate transistors into a space the size of a period.

Runner-up:

Verayo Inc., U.S.: A technology for authenticating microchips that uses the slight variations in each chip's physical characteristics for secure identification purposes.

## *Software*

The software award goes to [Xerox](#) Corp.'s Xerox Research Centre Europe in Meylan, France, for a prototype customer-support system that uses three-dimensional virtual-reality imaging to connect customers with live help-desk assistance directly from a broken printer.



Xerox

Xerox Research Centre Europe's virtual help desk

With the technology, which isn't yet on the market, a customer can press a "help" button on the printer that launches an Internet phone call to the help desk. At the same time, it loads and displays a 3-D model of the device on both the customer's and the call center's screens, and the agent receives diagnostic information directly from the device.

The agent can identify the fix and then guide the customer through the repair using the 3-D model, reducing the need to dispatch service technicians.

Runner-up:

[Yahoo](#) Inc., U.S.: Software for smartphones and tablets that identifies the television programming users are watching and automatically shares it with users' friends.

## *Transport*

Hybrid gas-electric vehicles save energy, reduce emissions—and are much more expensive than their gasoline-powered counterparts. KPIT Cummins Infosystems Ltd. won in the transport category for Revolo, a kit for converting regular gasoline-powered automobiles into hybrids.

KPIT Cummins, of Pune, India, says the conversion can increase fuel efficiency by 35%

and reduce emissions by 30% at a fifth of the cost of existing hybrid options. The conversion takes less than six hours, and the kit can be used to switch over existing vehicles or in manufacturing new ones.



SmartGrains

A parking app based on the SmartGrains network

The conversion kit includes an electric motor with an electronic controller, a battery pack, software for controlling the motor and batteries and an intelligent battery-management system to enhance performance and battery life. The motor doesn't rely on permanent magnets, which require expensive rare earth minerals. Unlike [Toyota Motor Corp.](#)'s Prius hybrid, the Revolo system uses standard lead-acid batteries.

The kit will be available in the next year, the company says.

Runners-up:

[Rockwell Collins Inc.](#), U.S.: A "synthetic vision" display that projects computer-generated images of terrain and other data on an aircraft's windshield for safer navigation in low-visibility conditions.

[SmartGrains](#), France: A network of wireless sensors that provides an updated view of available parking spaces on streets and in parking lots.

[Streetline Inc.](#), U.S.: An application for smartphones and in-car navigation systems that delivers data on available parking spots nearby.

## Wireless

Access to mobile communications is credited with boosting local economies, but almost a quarter of the world's population doesn't have affordable access to wireless voice and data services. [Altobridge Ltd.](#) of Kerry, Ireland, won in this category for developing a low-cost solar-powered wireless system called "lite-site" that aims to tackle three big barriers to extending wireless service to remote areas: high capital costs, high operating costs and high transmission costs.

Each base station in [Altobridge's](#) system uses only 90 watts of power, making it possible for stations to operate solely on solar energy. And by compressing data transfers, the system needs only about a quarter of the satellite bandwidth normally required, reducing transmission costs.

The first lite-site station was installed in Sarawak, Malaysia, in 2007. Since then, the company has installed systems in Mongolia, Indonesia, Niger and other nations.

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