DANIEL BURRUS'
TECHNO TRENDS
THE BIG IDEAS THAT ARE CHANGING EVERYTHING

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25 Game-Changing Hard Trends for 2014 – Part 1

By Daniel Burrus, CEO of Burrus Research

No matter what industry you're in, your company can't survive without technology. From smart phones and tablets to mobile apps and cloud-based technology, there's a plethora of technological advancements to not only keep track of, but also to profit from. To stay competitive, your organization needs to anticipate the most significant technology trends that are shaping your business and changing your customer, and then develop innovative ways to use them to your advantage, both inside and outside of your organization. Remember, if it can be done, it will be done. If you don't use these technologies to create a competitive advantage, someone else will.

Over the next five short years the following game-changing technologies will transform how we sell, market, communicate, collaborate, educate, train, innovate, and much more.

1. Big Data Gets Bigger and Becomes a Service. Big Data is a term to describe the technologies and techniques used to capture and utilize the exponentially increasing streams of data with the goal of bringing enterprise-wide visibility and insights to make rapid critical decisions. Companies are learning the hard way that Big Bad Data can get you into trouble fast, so there is a new push to focus on the quality of the data as it is being captured. High Speed Analytics using advanced cloud services will increasingly be used as a complement to existing information management systems and programs to tame the massive data explosion. This new level of data integration and analytics will require many new skills and cross-functional buy-in in order to break down the many data and organizational silos that still exist. The rapid increase in data makes this a fast-growing hard trend that cannot be ignored. Big Data as-a-Service (BDaaS) will emerge this year as cloud providers offer midsize and smaller

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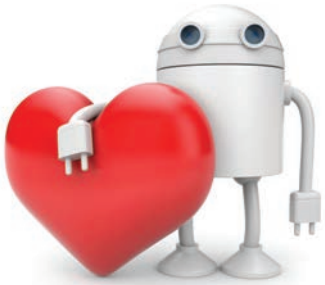
TECHNOLOGY NEWS HIGHLIGHTS

Artificial Heart and Muscles for Robots



A new pump made from shape memory alloys may bring us one step closer to fully autonomous robots capable of operating reliably without any human intervention. Using a design based on the human heart, engineers created the new device specifically for EcoBots – a category of robots that are powered by urine and other liquid effluents. Simpler than an electric motor-driven pump, the new concept should be less prone to mechanical failure and blockages.

Artificial muscle fibers made from the alloys alternately compress when exposed to an electric current, and relax when the current is removed. This creates a pumping action that ejects the fluid to the EcoBot's fuel cells, where microbes break it down to generate electricity.

The robots could recharge themselves by collecting their own fuel from public lavatories or farm waste systems. The researchers envision deploying EcoBots in areas where extreme pollution levels or other dangers pose high risks to humans.

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Stronger and Lighter Steel

U.K. auto makers will soon be incorporating two new types of heat-hardened sheet steel into consumer cars. In addition to providing added structural strength, the new materials will allow manufacturers to reduce overall vehicle weight, improving fuel

efficiency while still maintaining high safety standards.

Bake Hardening 260 (or BH260) is seven percent lighter than traditional steel and designed for exposed areas of car bodies, where minimizing surface imperfections is important. It also features an anti-corrosive zinc coating, and may be easily shaped and welded. Another product known as DP800GI is designed for use in fabricating the vehicle crash structure. Its superior strength allows for thinner, lighter components to keep weight down and safety standards up.

The company recently started manufacturing both products in the U.K. and on mainland Europe to localize product supply capabilities and further reduce the impact of long-distance shipping on the environment.

For information: Tata Steel Limited, Bombay House, 24, Homi Mody Street, Mumbai, India 400-001; phone: +91-022-6665-8282; Web site: ***www.ttasteel.com/***

3D Tactile User Interface

As we increasingly use screens to simulate 3D objects, humans will be missing out on tactile sensation and the ways in which it guides our interactions with the world around us. So, researchers at MIT are looking for ways to bring a 3D sense of touch back to simulations.

Rather than just simulate real-life objects like knobs, dials and buttons, their approach is to reproduce them in three dimensions so that users can physically manipulate them using what they call "programmable matter." Much like the executive desk toy that allows you to create a 3D mold by pressing an object into it, the new technology – known as inFORM – consists of an array of pins connected to motors that are controlled by a laptop. As the pins are moved up and down, the device can render digital content physically, or even create real-life shapes remotely.

Imagine playing catch via Skype, giving someone a remote "high five," or holding hands with a loved one thousands of miles away. Tangible interfaces may one day make all of that...and more...possible.

For information: Toyota Motor Corporation, 1 Toyota-cho, Toyota City, Aichi Prefecture, 471-8571, Japan; phone: +81-0565-28-2121; Web site: ***www.toyota-global.com*** *JX Nippon Oil & Energy Corporation; 6-3 Otemachi 2-chome, Chiyodaku, Tokyo 100-8162, Japan; Web site:* ***www.noe.jx-group.co.jp/english/***

3D Renderings from Text

A new technology called Text-to-3D makes it easier than ever to create three-dimensional images from PCs, tablets, smartphones, and even smart TVs

The cloud-based rendering service allows users to type descriptions of any object or environment on a keyboard and it will automatically render the typed word into a 3D model.

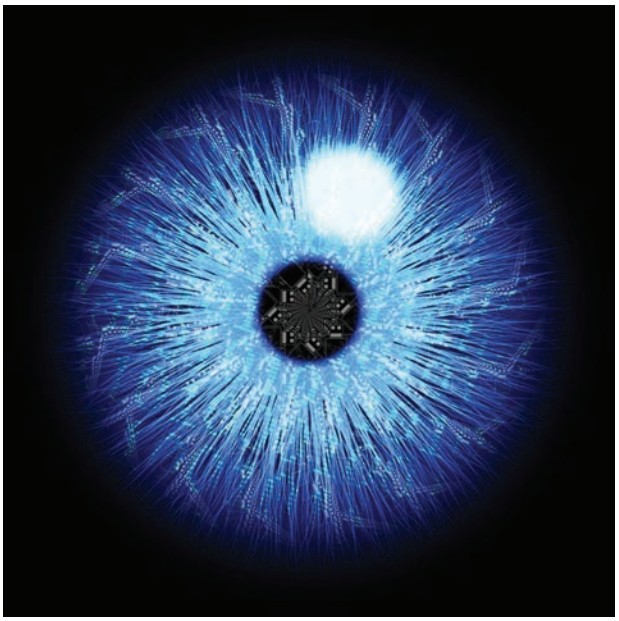
The software not only supports the names of objects (such as "table"), but also recognizes adjectives that modify them (such as "round," "square," "wooden," "glass") as well as words that place other objects relative to them (such as "next to," or "on top of"). In addition, the items can be tagged based on style, time, and geographical location, and can range from simple objects to scenes (such as a living room or street) and even to entire worlds.

Eventually, the technology could be used to visualize most vocabulary words, object-based data on the Internet, or even descriptions in books. It might even be possible someday to create entire movies from text. It's compatible with Mac OSX, Windows 7/8 and Linux operating systems and can be downloaded online.

For information: Brain District Gm BH, Stolberger Strasse 200, 50933 Cologne, Germany; phone: +49-221-6778-7523; fax: +49-221-6778-75239; email: ***info@braindistrict.de****; Web site:* ***www.braindistrict.com/en/raysupreme-3d***

Bionic Eye

A new surgically implanted prosthesis has been approved by the Food and Drug Administration that restores at least limited vision to patients with severe to profound retinitis pigmentosa, even in cases where there is little or no light perception in both eyes. In these individuals, where the photoreceptors no longer function, the device – known as Argus II – bypasses the damaged receptors and transmits signals directly to the optic nerve, where they are transferred to the brain.



A video camera mounted on a pair of eyeglasses receives images and sends them to a video processing unit. The processed information is transmitted wirelessly to an electrode array implanted at the back of the eye. The optic nerve then "sees" them as gray scale pictures. The system provides adequate resolution for the wearer to visualize lines in a crosswalk or read letters about an inch tall. Future trials are planned to assess the effectiveness of the system for treatment of macular degeneration, the leading cause of blindness in Americans over 60 years of age.

For information: Second Sight Medical Products, Inc., 12744 San Fernando Road, Building 3, Sylmar, CA 91342; phone: 818-833-5000; fax: 818-833-5067; Web site: ***http://2-sight.eu/en/product-en***

Package Delivery Drone from Amazon?

Amazon recently announced that they have begun testing the next generation of package delivery – the octocopter. Named for their eight propellers, the drones are about the size of a remote-controlled airplane, and are designed to deliver plastic bins (about the size of a shoebox) to residential customers.

The announcement came on the heels of the Federal Aviation Administration's release of a roadmap for integrating unmanned aerial vehicles (UAVs) into U.S. airspace. The latest guidelines cover non-commercial use such as law enforcement, fire, and national security on a case-by-case basis. We are still a few years away from an FAA ruling regarding commercial uses of drones.

But don't be looking for octocopters to be landing on your doorstep. If the FAA allowed Amazon to use drones to deliver packages, they would have to allow all companies including Wal-Mart to do so as well, which would quickly fill urban skies with thousands of drones. Because of environmental, safety, and privacy factors, the FAA's near future ruling will only allow limited commercial use for drones in populated areas. Agriculture is a good example of a non-urban application that will most likely be allowed.

For information: Amazon.com, Inc., 410 Terry Avenue North, Seattle, WA 98109; phone: 206-266-1000; Web site: ***www.amazon.com/b?node=8037720011***

Smart Soil Probe

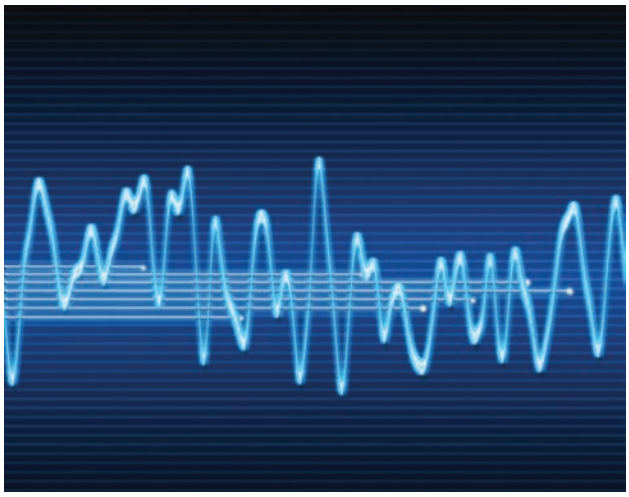
A solar-powered soil sensor will soon be available for home gardeners that will continuously monitor the condition of their garden and let them know when it needs attention. The product is specifically designed for gardens and small farms to optimize conditions for people to grow their own healthy, fresh produce.

Dubbed Soil IQ, the device is paired with an app that logs a variety of soil parameters, including nutrient levels, pH, temperature, moisture and light. It will even send an SMS or Twitter alert when the garden needs tending, and works equally well with soil-based and hydroponic gardening techniques.

Soil IQ was originally developed to analyze the effectiveness of a system known as Climate Kiln – an oven that uses biomass to produce a substance called biochar. When mixed into the soil, biochar has been shown to improve water infiltration, balance acidity, and improve the activity of beneficial microbes that produce nutrients. In addition to the product and app (which will sell for around $50), the company plans to generate revenue by licensing the data they gather on what grows best and in which locations.

For information: Jason Aramburu, Soil IQ; Web site: ***www.soiliq.co*** *Re:char; phone: 512-609-0632; fax: 512-367-5697; email:* ***info@re-char.com****; Web site:* ***www.re-char.com***

Gesture Recognition System for Small Devices



A 3-D gesture recognition system is currently being developed, which uses ultrasonic sound waves to identify motion. Designed to be implanted in wearable devices, it can be used to control all sorts of consumer electronics, but particularly those with small screens (like watches) or those that would be inconvenient to access with your hands (such as Google Glasses).

It works by sending ultrasonic pulses outward from an array of transducers built into the device to be controlled. As they echo off of objects in their path, the time it takes to return can be measured electronically, and those measurements can be translated into distinct hand gestures.

The current chips are about 5mm square, but could be made half that size. The system can be used in darkness as well as bright light at distances up to a meter. And since sound travels at a relatively slow speed, the associated electronics can be operated at low-speed, lowering power consumption levels to the point where the technology could run continuously off a tiny watch battery for 30 hours.

The developers envision establishing a standard set of hand commands that would be pre-programmed into Chip-enabled devices. For example, you could pass your finger over your smart phone to flip through a photo gallery without touching the screen, then zoom out of a photo by pulling your hand away.

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25 Game-Changing Hard Trends for 2014

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organizations access to much larger streams of relevant data they could not tap into otherwise.

2. Cloud Computing Gets Personal and Advanced Cloud Services will be increasingly embraced by business of all sizes, as this represents a major shift in how organizations obtain and maintain software, hardware, and computing capacity. As consumers, we first experienced public clouds (think about when you use Google Docs or Apple's iCloud). Then we saw more private clouds giving companies the security and limited access they needed, as well as hybrid clouds that provided both, giving customers and consumers access to specific areas of a company's cloud. Companies of all sizes are using the cloud to cut costs in IT, human resources, and sales management functions. As individuals increasingly use personal mobile clouds, we will see a shift to services and less of a focus on the devices we use to access our services. This shift will also help us address the three limiting factors of mobility: battery life, memory, and processors.

3. On Demand Services will increasingly be offered to companies needing to rapidly deploy new services. Hardware-as-a-Service (HaaS) is increasingly joining Software-as-a-Service (SaaS), creating what some have called "IT as a service." The rapid growth of Collaboration-as-a-Service (CaaS), Security-as-a-Service (SaaS), Networking as-a-Service (NaaS), and many more are all giving birth to Everything as-a-Service (XaaS). All will grow rapidly for small as well as large companies, with many new players in a multitude of business process categories. These services will help companies cut costs as they provide access to powerful software programs and the latest technology without having the expense of a large IT staff and time-consuming, expensive upgrades. As a result, IT departments in all industries will be increasingly freed to focus on enabling business process transformation, which will allow organizations to maximize their return on their technology investments.

4. Virtualization of Storage, Desktops, Applications, and Networking will see continued acceptance and growth by both large and small businesses as virtualization security improves. In addition to storage, we will continue to see the virtualization of processing power, allowing mobile devices to access supercomputer capabilities and apply it to processes such as purchasing and logistics, to name a few.

5. Consumerization of IT increases, as consumers become the driving source for innovation and technology, which is fueled by rapid advances in processing power, storage, and bandwidth. Smart companies have recognized that this is a hard trend that will continue and have stopped fighting consumerization. Instead, they are turning it into a competitive advantage by consumerizing their applications, such as recommending safe and secure third party hardware and apps. Encouraging employees to share productivity enhancing consumer technology will become a wise strategy.

6. Wear Your Own Device (WYOD) will take off this year as wearable technology goes mainstream with big players launching smart watches, smart glasses, and more, creating new problems as well as opportunities for organizations of all sizes. Over the past few years, Bring Your Own Device (BYOD) caught many IT departments by surprise; it's now time to get in front of this predictable hard trend and turn it into an advantage.

7. Gameification of Training and Education will accelerate a fast-moving hard trend of using advanced simulations and skill-based learning systems that are self-diagnostic, interactive, game-like, and competitive, all focused on giving the user an immersive experience thanks to a photo-realistic 3D interface. Some will develop software using these gaming techniques to work on existing hardware systems such as both old and new versions of Xbox and PlayStation. A social component that includes sharing will drive success.

8. Online Learning and Massive Open Online Courses (MOOC) have been embraced by highly recognized and traditional educational institutions, putting them in a position to challenge all educational systems by making Location and Tuition far less of a barrier to receiving the information, training, and knowledge people need to know in order to succeed in a rapidly

changing world. This hard trend, combined with Gameification systems, will change the face of global education.

9. eBooks, eNewspapers, eMagazines and Interactive Multimedia eTextbooks are finally passing the tipping point due to the abundance of smart phones and tablets that provide a full color experience, and publishers providing apps that give a better-than-paper experience by including cut, copy, paste, print, and multimedia capabilities. Interactive eTextbooks will finally take off thanks to easy-to-use software such as Apple's iBook Author and other competing tools, freeing new publishers to create compelling and engaging content, and freeing students from a static, expensive, and literally heavy experience.

10. Social Business Applications take on a new level of urgency as organizations shift from an Information Age "informing" model to a Communication Age "communicating and engaging" model. Social Software for business will reach a new level of adoption with applications to enhance relationships, collaboration, networking, social validation, and more. Social Search and Social Analytics will increasingly be used by marketers and researchers, not to mention Wall Street, to tap into millions of daily tweets and Facebook conversations, providing real-time analysis of many key consumer metrics.

11. Smart Phones & Tablets Get Smarter with the rapid advances in processing power, storage, and bandwidth. Smart phones have already become our primary personal computer, and the Mobile Web has become a must-have capability. An Enterprise Mobility Strategy Becomes Mandatory for all size organizations as we see mobile data, mobile media, mobile sales, mobile marketing, mobile commerce, mobile finance, mobile payments, mobile health, and many more explode. The vast majority of mobile phones sold globally will have a browser, making the smart phone our primary computer that is with us 24/7 and signaling a profound shift in global computing. This new level of mobility and connectivity by many millions around the world will allow any size business to transform how they market, sell, communicate, collaborate, educate, train, and innovate using mobility.

12. Mobile Apps for Business Processes such as purchasing, supply chain, logistics, distribution, service, sales, maintenance, and more will grow rapidly. There will be an increasing focus on Business App Stores within companies giving users access to personalized information they need on their mobile devices anytime and anywhere.

Next month, I will share the other 13 game-changing technology-driven trends to complete my Top 25 list. In the meantime, think about the 12 Hard Trends I've given you and how you can adapt them to your unique environment before the competition does.

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