DANIEL BURRUS'

TECHNO TRENDS

THE BIG IDEAS THAT ARE CHANGING EVERYTHING

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12 Certainties That Will Transform Every Career and Create New Ones

By Daniel Burrus, CEO of Burrus Research

As technology continues to impact our lives, workers in today's ever-changing labor market need to be prepared with skills to adapt and succeed in the workplace.

The problem is, we live in an uncertain world, and because of the high levels of uncertainty we all face, people of all ages and career levels are finding it difficult to know what new skills to learn, what courses to take, and what degrees to get that will provide them with the most opportunity going forward. Uncertainty keeps us stuck in the present.

Certainty, on the other hand, gives us the confidence to make a decision, to move forward, and to invest time and money to learn new things. Over the past thirty years, I have developed and proven the power of the science of certainty. The science of certainty involves a scientific method of separating Hard Trends – trends that will happen – from Soft Trends – trends that might happen. This method is currently being used by many Fortune 500 companies including IBM, Deloitte, and Pratt & Whitney to name a few, to provide an accurate roadmap of the opportunities that are ahead.

That's why I'm launching a list of 12 Certainties that will transform every career, and create new ones. By providing an accurate roadmap for anyone who wishes to increase their personal career relevancy in a world of transformative change, you can now make career and education decisions with confidence. The list highlights technologies that are now, and will continue to transform present and future careers.

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In today's world of technology-driven change, it has never been more important to

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Technology is transforming how we sell, market, communicate, collaborate, innovate and educate.

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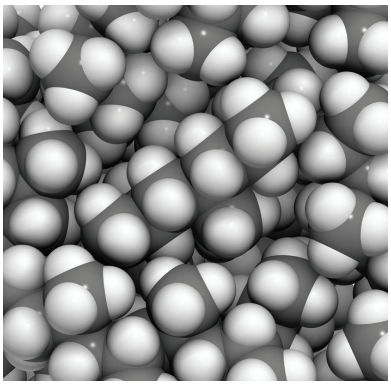
TECHNOLOGY NEWS HIGHLIGHTS

Super Strength Plastic



Researchers in Israel have developed a new catalyst that will enable commonly used plastics to replace steel in a variety of applications. Using the new process, they have created a type of polypropylene that is not only strong, but also has a very high melting point, making it a viable alternative even in high temperature environments.

The benefits of plastic over traditional steel are numerous. In addition to cheaper raw materials, plastics consume less energy in the production process, making them much more affordable to manufacture. They're also very lightweight in comparison to most metals, so vehicles made with plastic parts can be lighter and, therefore, more fuel-efficient. Other areas being targeted for the new material include pipelines and machinery.

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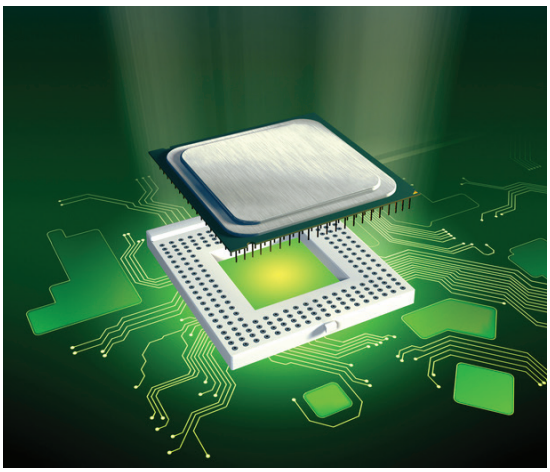
Exaflop Computing

Only recently (it seems) processing power passed the petaflop threshold (that's one quadrillion floating point operations per second), and true to Moore's Law, it's expected that we'll be seeing exaflop (one thousand petaflops) computers before the end of the decade. Interestingly, computer scientists aren't too concerned about storing or processing such huge amounts of data, but they are concerned about how humans will be able to make sense of it. It turns out, our brains are only capable of receiving information at rates in the gigabit range, so this much data would literally overwhelm us.

But computer scientists in Japan have proposed a creative way to



compress the data, taking their cue from a filming technique known as "bullet time" (ala The Matrix). They've developed a visualization technique known as ϖ-CAVE, a multi-modal system for analyzing and understanding output data from large-scale computer simulations. Like bullet time, it slows down the information enough to show events that are normally imperceptible and surrounds the "action" with thousands (or millions) of virtual cameras that record it from every angle. Users can then view the slow-motion data from a variety of perspectives by switching from one angle to the next.

The data compression is quite impressive. In a 10-gigabyte simulation of seismic waves recorded from 130 virtual cameras, the resulting movie ended up being 1.7 gigabytes. They expect the compression ratio to increase with larger scale simulations.

For information: Akira Kageyama, Kobe University, Graduate School of System Informatics, 1-1 Rokkodai-cho, Nada-ku, Kobe 657-8501, Japan; phone: +81-078-803-6257; fax: +81-078-803-6390; email: ***eng-soumu@office.kobe-u.ac.jp****; Web site:* ***www.csi.kobe-u.ac.jp/english/index.html***

Antimicrobial Hydrogel

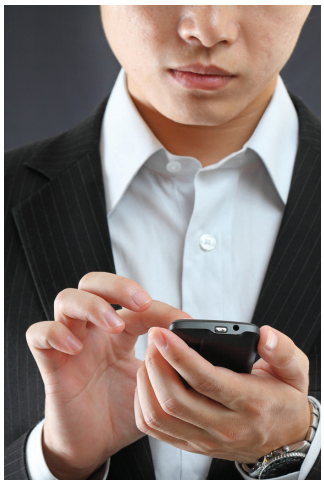
Drug-resistant superbugs continue to be a problem in hospitals, despite advances in sterilization methods and aseptic technique. According to recent estimates, hospital-acquired infections account for up to $11 billion in health care costs annually, and are among the top five leading causes of death in the U.S.

One group of disease cells called microbial biofilms occurs in 80 percent of infections. They're able to colonize on virtually any surface, making them particularly difficult to eradicate by conventional means. But a new hydrogel has been developed that can break through the biofilms and kill the bacteria on contact.

The synthetic polymer is water soluble, biodegradable, biocompatible and non-toxic. When heated to body temperature, the polymers self-assemble into a gel with a positive charge that attracts negatively charged microbes, then kills them through a process of membrane disruption, eliminating any possibility of developing resistance. It works for many common bacteria (such as MRSA and e. coli) as well as yeast and fungus infections.

For information: James Hedrick, IBM Research-Almaden, 650 Harry Road, San Jose, CA 95120; phone: 408-927-1080; Web site; ***www.research.ibm.com***

Tactile Keyboard for Touch Screens



Perhaps the single thing that people like least about their touch screen devices is typing on them. With no tactile feedback, it's difficult to know whether you've hit the correct key (or any key for that matter). But a new technology that may be in production as early as the end of the year is poised to change the way we interact with our smartphones and tablets.

Tactile Layer™ uses microfluidics to make buttons rise up from the screen on demand and disappear when they're not needed. Built-in channels filled with a non-toxic liquid actually push up the surface to create keys. The current version has the keys arranged in a single, fixed array, but eventually the layout will be dynamic, depending on the orientation of the device (e.g. portrait or landscape) or the application driving it. The pressure could even be adjustable to customize the feel.

Tactile Layer is scalable for any size display from phones to computers to televisions, and integrates with existing touch screen technologies simply by replacing the front layer.

For information: Tactus Technology, 34175 Ardenwood Blvd., Suite 101, Fremont, CA 94555; phone: 650-918-7509; fax: 650-641-2348; email: ***info@tactustechnology.com****; Web site:* ***www.tactustechnology.com***

3D Printing Pen

A new product is scheduled to hit the market this fall that will change the concept of doodling forever. 3D Doodler is basically a 3D printer in a handheld pen that allows you to lift your doodles right off the page.

It uses spaghetti-like strands of ABS or PLA plastic, which are loaded into the pen similar to a glue gun. The plastic "ink" is heated to about 270 degrees Centigrade and extruded through the tip. It then quickly cools and hardens into a strong, stable structure, allowing you to build virtually any shape either on a surface or in mid-air. It's the easiest and least expensive 3D "printer" available.

The pen measures about 7 inches in length and 1 inch in diameter, weighs approximately 7 ounces, and will be able to run off of 110v or 240v power. The expected list price, including a starter supply of plastic, is around $75.

The product was recently launched on Kickstarter where it quickly exceeded the developer's fundraising goal of $30,000 (they're currently over $2 million).

For information: WobbleWorks LLC; email: ***info@wobble-works.net****; Web site:* ***www.wobbleworks.net***

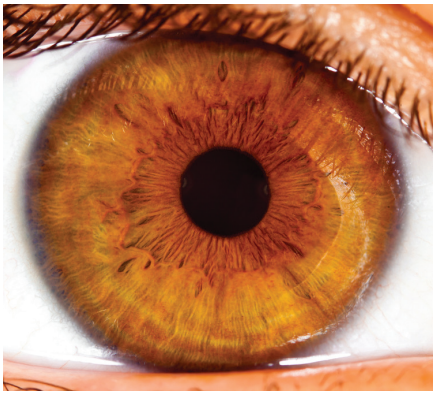
Smart Power Grid

Verification testing is currently underway for a community-wide energy supply-demand control system, which could be available to utility companies in as little as two years. The system will allow power companies to link up with home storage batteries to create large scale networks that can be tapped during peak demand.

This concept is becoming increasingly more important as power companies shift toward renewable energy sources such as solar and wind power. Homes would store power at night when demand (and rates) are low, then sell it back when demand (and prices) are high. The goal is to design flexible rate plans that will allow customers to recoup the initial cost of installing the batteries while keeping generating costs low. Over the next two years, a prototype system installed in Yokohama will be used to forecast supply and demand based on sunlight, wind and weather conditions.

For information: Toshiba Corporation, 1-1. Shibaura 1-chome, Minato-ku, Tokyo 105-8001, Japan; fax: +81-3-5444-2906; Web site: ***www.toshiba.co.jp/index.htm***

Bionic Eye



The FDA recently approved a prosthesis system for patients suffering from retinitis pigmentosa (RP), a condition in which the cells of the retina are damaged, causing impaired night vision. The approval covers a very specific population of adults who have little or no light perception in both eyes but with a history of being able to discern forms. They must also have a functional retinal inner layer.

Images from a video camera mounted on a pair of glasses are transmitted wirelessly to an array of electrodes implanted into the retina. These electrodes stimulate the retina to produce images that can be "seen" by the wearer. Participants in the clinical trials reported an increased ability to detect the direction of motion, the presence of street curbs and the ability to sort black, gray and white socks.

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

Copy-Proof Ink

An innovative new ink that is virtually impossible to replicate has been developed using a mixture of ink and artificial DNA. Plans are already underway to use the product for printing cash vouchers, passports, merchandise tags and other sensitive documents so that fraudulent copies can be easily identified.

It utilizes the company's core technology called "unnatural base pair systems," which enables functional components to be incorporated into DNA, RNA and proteins at specific sites. Other potential applications of the base technology include diagnostic reagents, therapeutic drugs and biometrics.

For information: Ichiro Hirao, TagCyx Biotechnologies, 1-7-22 Suehiro-cho, Tsurumi-ku, Yokohama-shi, Kanagaawa 230-8045, Japan; phone: +81-45-503-9644; fax: +81-45-503-9645; email: ***info@tagcyx.com****; Web site:* ***www.tagcyx.com/index_en.html***

12 Certainties That Will Transform Every Career

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As you read through the list, ask yourself how each one will play a key role in your industry and your personal career path.

1. **Mobile Hardware, Software and Services** will continue to rapidly evolve creating many new careers, as all phones become smartphones and our primary computer and tablets continue to evolve as our laptop replacement. This new level of mobility will allow any size business to transform how they market, sell, communicate, collaborate, educate, train, and innovate.

2. **Remote Visual Communications** will become a primary relationship-building tool for businesses of all sizes as employees use smartphones, tablets, and laptops, in combination with current video conferencing systems, to communicate at new levels with customers, partners, and employees.

3. **Social Business Enterprise Management** will grow rapidly as organizations shift from an Information Age "informing" model to a Communication Age "communicating and engaging" model. New careers will emerge as Social Software for business rapidly grows with applications to enhance relationships, collaboration, networking, social validation, and more. Social Search will increasingly shape careers as marketers, researchers and those on Wall Street create applications and services to tap into millions of daily tweets and Facebook conversations, providing real-time analysis of many key consumer metrics.

4. **Cyber Security and Forensics** careers will grow rapidly as we become increasingly connected and dependent on computer systems and machines using intelligent sensors connected to just about everything. Careers in data and information forensics will grow rapidly as the need to solve cyber crimes increases.

5. **Additive Manufacturing (3D Printing)** will create many new careers in manufacturing as this revolutionary technology allows any size company to manufacture quickly, locally and with far fewer costs. Additive manufacturing builds things by depositing material, typically plastic or metal, layer by layer until the final product is finished. Examples of final products today include jewelry, iPhone cases, shoes, car dashboards, parts for jet engines, prosthetic limbs and much more.

6. **Gamification of Education** will create many new careers as corporations and educational institutions at all levels accelerate learning by 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.

7. **Cloud Services and Virtualization** will be increasingly embraced by businesses of all sizes, as this represents a major shift in how organizations obtain and maintain software, hardware, and computing capacity. IT is rapidly becoming an on-demand service that is rapidly transforming all business processes resulting in a rapid evolution of current careers as well as creating new careers in every functional area.

8. **Big Data and Real-Time Analytics** 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. This new level of data integration and analytics will require many new skills and cross-functional training in order to take advantage of new opportunities as well as breakdown the many data and organizational silos that still exist.

9. **Intelligent ePersonal Assistants** using natural language voice commands was launched with Apple's Siri, which was rapidly followed by Google, Microsoft, and others all offering what will become a mobile electronic concierge on your phone, tablet, and television. The technology will rapidly evolve and soon every profession from retailers to maintenance workers will have a Siri-like assistant. Adding an e-personal assistant to support an existing product and/or service will create many new careers.

10. **3D Web** will transform today's Internet experience (which is like looking at a flat piece of paper with a few photos, embedded video, and a few hyperlinks) to a true 3D experience, similar to todays video games, where you can virtually walk into a showroom, look around and both listen to and see the new car you are interested in, or whatever the website is trying to show you. This will employ many new graphic artists, designers and programmers.

11. **Connected Intelligent Objects** using chips, microsensors and both wired and wireless networks will create a rapidly growing "Internet of things" sharing real-time data, performing diagnostics, and making remote repairs. Many jobs will be created as we add intelligent connected sensors to bridges, roads, buildings, homes and much more. By 2020, there will be well over a billion machines talking to each other and people will install them.

12. **Advanced Robotics and Automation** will take a giant leap forward thanks to networked sensors, artificial intelligence, and Siri-like voice communications, taking the next level of repetitive jobs from humans. This will create many new career opportunities from design, programming, and installation to service and maintenance, to name just a few.

You don't have to know the physics of a telephone in order to use it. You do have to know it exists and how to creatively use it to accomplish your goal. Don't wait until next year, or the year after, or until you're laid off. Invest the time to identify what you need to learn right away so that you will thrive both now and in the future, either in your current career or a new one.

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