

DANIEL BURRUS'

# TECHNO TRENDS

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THE BIG IDEAS THAT ARE  
CHANGING EVERYTHING

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## Change Your Employees' View of Change

By Daniel Burrus, CEO of Burrus Research

The general thinking is that people don't like change. In reality, humans are born loving change. Think about it ... babies cry until you change them. Also, why do we take vacations? Because we want a change. We need to get out of our usual surroundings and see something new. In this case, change is a choice, and we like it.

But there is also a negative side to change, and that is when the change affects you personally and you didn't see it coming. However, most of those changes that come "out of nowhere" are actually very visible months or even years before the change hits. When do people get burglar alarms? After being robbed! We all tend to react to change and put out fires more than we anticipate what will happen based on the direction change is heading.

It's time to become more anticipatory in terms of change so you can see it coming. Only then can you use change as an opportunity for growth rather than a crisis to be managed.

### How to Be Anticipatory

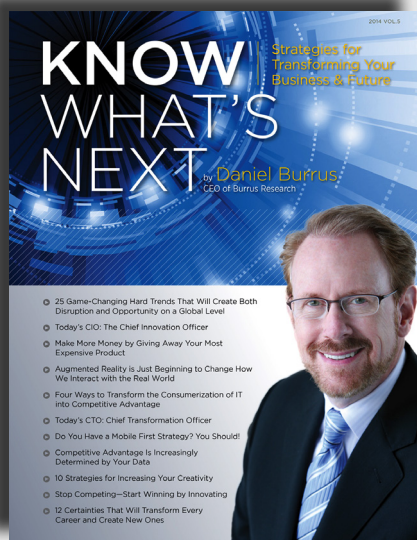
There are two types of change that you can use to see the future accurately. First is cyclical change. You're in the midst of cyclical change every day: weather cycles, biological cycles, business cycles ... these are all examples of cyclical change. In the United States, you know exactly when the next presidential election will be, when the next full moon will be, plus many other key things that cycle with time. You know that if the stock market goes up, it will eventually go down. Cycles are everywhere; you just have to be aware of them.



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## Know What's Next Magazine

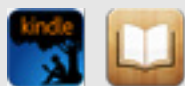


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## TECHNOLOGY NEWS HIGHLIGHTS

### Overcoming Antibiotic-Resistance

Overuse of antibiotics has created a number of strains of “superbugs” that are resistant to nearly all forms of treatment. One such threat is a type of tuberculosis (TB), a deadly infectious disease that affects the lungs and which has returned in a



resistant state, prompting researchers to seek out solutions that will stop the spread of these diseases once and for all.

Recently, a new compound was patented that is designed to basically “cure” bacteria of their resistance and return them to a primitive, susceptible state. It does this by blocking a mechanism known as an efflux pump, which helps superbugs to ward off antibiotics before they have a chance to work. This enables the antibiotics to remain in the bacteria until they die off.

The substance is effective in very small doses with no harmful side effects. Because the new medication, known as JEK47, is derived from an already approved antipsychotic, it is hoped that this ground-breaking drug will be able to be released without lengthy clinical trials and at a cost that will allow for widespread distribution, particularly in poorer countries where the need is currently the greatest.

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## Climate-Proof Rice

Nearly half of the world's seven billion people rely on rice as a dietary staple, and approximately 90 percent of all the rice grown is consumed in Asia. With climate instability increasing, it's become more important than ever to come up with ways to improve yields and sustain future generations.



Genetic engineering has played an important role in coping with individual environmental stresses such as drought, salt and lack of adequate fertilization. However, a new strain of "super rice" has now been developed that can handle all three so that farmers can grow the same variety year after year, regardless of the growing conditions. A type of cress contributed the gene that gives the rice its salt tolerance; drought tolerance came from a soil bacterium; and a gene from barley enables the plant to utilize nitrogen more efficiently, so it requires less fertilizer.

It has been estimated that global crop losses from drought alone cost \$13 billion per year, and salt contamination adds another \$1 billion.

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## Electric Car Recharges With Solar

Ford recently unveiled a prototype of its C-MAX Energi hybrid that can run on roof-mounted photovoltaic panels for up to 34 kilometers (about 21 miles). Billed as the first electric vehicle

that doesn't need to be plugged in, it represents an important shift in automotive design toward total energy independence.



In order to overcome the relative inefficiencies of solar energy conversion, the concept car includes a 20-square meter canopy that acts as a giant magnifying glass to intensify the sun's rays, and charge the lithium ion batteries up to eight times faster than if it were simply parked in the sun. As the car tracks the position of the sun using sensors and cameras, it moves around under the acrylic lenses to optimize exposure.

*For information: Ford Motor Company. P.O. Box 6248, Dearborn, MI 48126; Web site: [www.ford.com/cars/cmax/models/](http://www.ford.com/cars/cmax/models/)*

## Nanowire Touch Screens

A new patterned silver nanowire film could revolutionize touch screens and support the ever-growing consumer demand for touch-enabled devices. The highly transparent material boasts a transmittance of more than 89 percent while offering adequate electrical resistance for fast response.



The key component is a conductive ink made from silver wires that are only a few nanometers in diameter and a few micrometers long. When printed on a polyester (PET) substrate, the result is a flexible conductive film that can be rolled and unrolled more than 100,000 times without breaking.

The availability of such a material eliminates many of the constraints that previously limited designs, such as rounded and angled surfaces. And it can support nearly any form factor – from small devices like phones and tablets to large area touch screens used in signage and gaming applications.

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## Breakthrough For Storing Power

For decades, one of the biggest obstacles to widespread adoption of renewal energy sources such as wind and solar has been the fact that storing the power generated is prohibitively expensive. Current battery technologies run about \$700 per kilowatt hour of capacity, which, according to the U.S. Department of Energy is about seven times what it needs to be to make economic sense.

Recently, researchers at Harvard developed a new battery based on an organic molecule in place of the metal ions that are typically used. Known as a quinone, the molecule is found in plants (including rhubarb) and can be synthesized from crude oil inexpensively. When used in a flow battery – where energy is stored in liquid form – they could cut the cost to just \$27 per kilowatt hour, well below DOE estimates for viability as a commercial system.



The developers tested 10,000 varieties to find a few candidates with the right properties for a battery such as voltage levels, ability to withstand multiple charge/discharge cycles and water solubility. Currently, the quinones are being used only on the anode side of the battery, however, new versions of the quinones are being developed that will also be able to replace the cathode components as well.

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## DNA Sketch Artist

A new technology that constructs accurate 3D models of human faces using nothing but DNA as a guide could change the way law enforcement agencies go about solving crimes. Rather than relying on facial recall by witnesses – which is far from an exact science – a model could be produced



using a sample of DNA from hair, saliva or other bodily fluids.

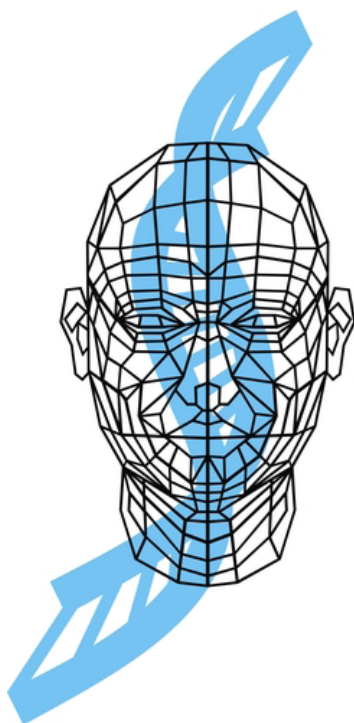
Three-dimensional images from hundreds of volunteers were compared with their DNA to identify over 7,000 points of reference. A software program then finds correlations between DNA, sex, race, and facial features. Surprisingly, the researchers found that 20 genes with only 24 variants were needed to identify a person's facial shape as well as the shape of their eyes, nose, forehead, cheeks and chin, making the method reliable enough to approximate someone's appearance.

The next step is to improve reliability of the system by increasing the number of reference points on each face to 30,000.

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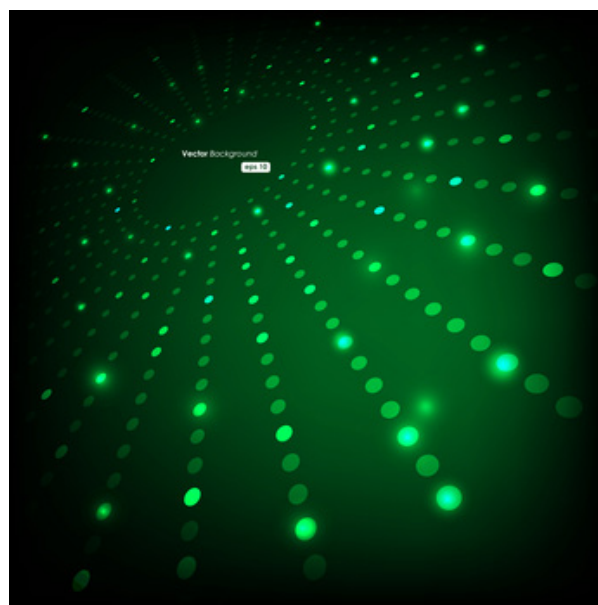
## Night Vision Contacts

Today's night vision goggles are relatively bulky, mainly due to the fact that they need supplemental equipment to cool the sensors themselves. But a new technology has been developed that is capable of detecting the full spectrum of infrared radiation, as well as visible and ultraviolet light in a super-thin,



wafer- like device.

Two sheets of graphene are separated by an insulating layer. When exposed to infrared light, electrons in the top layer of graphene are dislodged, creating positively charged holes. This produces an electrical field that affects the flow of current being sent through the bottom layer. By measuring the change in current, the brightness of the light can be deduced.



While infrared or "night" vision is best known for detecting people and animals in the dark, or heat escaping from a building, it can also be used to monitor blood flow, identify the presence of chemicals in the environment or examine an artist's sketch underneath layers of paint. The new device is currently smaller than a pinky nail, but can be scaled down further, making it suitable for contact lenses, smartphone cameras or other wearable electronics.

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## Personalized 3D Cardiac Implants

Today's heart implants use electrodes typically deployed at one or two points on the heart to determine when an assistive shock is needed.



The limited amount of information this provides limits the effectiveness of pacemakers and defibrillators and often results in unnecessary shocks to the patient. One solution has been to incorporate multiple types of sensors on a flat, flexible substrate, but when wrapped round a heart, wrinkles in the material cause poor or intermittent contact with the tissue.

Recently, researchers discovered a way to custom fit sensors. Using images of the heart, they created models using a 3D printer. They then built a sensor array out of a stretchy polymer substrate that fits the contours perfectly and also moves as the heart beats. The stretchy wrap can be embedded with a variety of sensors to capture ECG information as well as oxygenation, temperature, and pH. They have even experimented with a light sensor that could detect heart attacks by identifying the presence of NADH, a fluorescent enzyme that accumulates in the muscle during an attack.

To date, the technique has only been tested on

beating rabbit hearts outside the body. Trials in live animals, followed by years of human clinical trials will be needed in order to determine safety and effectiveness long term.

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## Change Your Employees' View

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The second is linear change. Once this type of change hits, you're never going back to the old way. For example, once you get a smart phone you're never going back to a dumb phone. Once the people in China park their bicycle and get a car, they will not go back to the bicycle as their primary form of transportation. It's one-way change with many predictable consequences.

When you look around and determine what cycles you experience in your business, as well as what linear changes have been happening and then look out from there, you can turn the predictable changes into an advantage. That's how you can be anticipatory and turn much of

today's uncertainty into certainty.

Certainties fall into two categories: Hard Trends and Soft Trends. A Hard Trend™ is a projection based on measurable, tangible, and fully predictable facts. A Soft Trend is a trend that "might" happen. That means you can change or influence a Soft Trend. For example, saying that Baby Boomers will age is a Hard Trend—it will happen; it's a future fact. But saying because over the past ten years fewer people have been becoming doctors means there won't be enough doctors to treat aging Baby Boomers is a Soft Trend—it's something we can choose to address or ignore; it's a future maybe. Being able to tell the difference between the two will enable your organization to transform its culture into one that profits from change, uncertainty, and burgeoning trends.

### Change the View

To get employees at all levels to embrace change, you have to give them the confidence that certainty brings by having them get involved in identifying the Hard Trends that will happen. Therefore, encourage them to...

- Make a list of all the Hard Trends that are taking place in your industry, so you know what you can be certain about.
- Make a list of all the Soft Trends taking place in your industry, so you can see what you can change or influence.

- Answer: What do I know will happen in the next few weeks, months, and years? And how can I innovate to take advantage of what I now know for certain about the future?

Additionally, let your employees know one more certainty: that their roles will change over the next five years. Tell them, "The people you report to can define what your new role is, but it would be better if you dictated your new role based on Hard Trends. You can either allow yourself to become less relevant or even obsolete, or you can see where your career is going and get the training and tools you need to become increasingly relevant and thrive." In addition, have them go to [www.certainties.com](http://www.certainties.com) for a list of the 12 career certainties that will shape every profession going forward.

DANIEL BURRUS CERTAINTIES™

Finally, realize that how you view the future shapes how you act today. And how you act today shapes your future. Therefore, your futureview becomes the future you. What is the futureview of your employees, business partners, and customers? When you manage the futureview and elevate it based on the Hard Trends and the certainties that are before you, your employees will actually embrace the changes before them. Remember, the good old days are not behind us. They're ahead of us. Let's make them happen together.



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