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Daniel Burrus'

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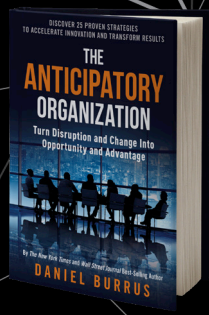
TECHNOTRENDS® NEWSLETTER

The biggest ideas that are changing everything

IN THIS ISSUE

MY NEW BOOK



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5 Ways to Move Past Benchmarks

By Daniel Burrus, CEO of Burrus Research

Many business consultants agree that benchmarking is imperative to strategic planning. By using metrics, a business will study the practices, processes, designs, products and financial outcomes of industry leaders with one distinct purpose: To keep up with the pacesetters.

It's most commonly done by closely reviewing the competition and their outcomes. However, business leaders are also encouraged to evaluate their own processes, practices and operations in a type of benchmarking known as Internal Benchmarking. If you have ever compared revenue earned per employee across all of your own business units, you have done internal benchmarking.

There are other popular benchmarking strategies, too. Generic benchmarking shows you what you can expect from foundational metrics, such as returns on investment, regardless of industry. Functional benchmarking compares your results to a business outside of your competitive set and most likely in another industry altogether.

Though benchmarking is well defined, often taught in business school and used pretty universally, there is one flaw: It's a practice of looking backward in an effort to move forward. There may be a better way – check out my five suggestions below.

1. **Move Past the Fool's Game**
Keeping up – with technology, with the competition, with anything in business or life – is what some would call a fool's game. Think about it: When you're merely keeping up, what's the advantage? In reality, there is no advantage; all you're doing is making yourself just like everyone else.

> *"Realize that "benchmarking" is just a fancy way of saying "keeping up."*

Most likely, you're finding out who the best is and then you're copying them. But by the time you get as good as the best, they have already moved on to something better and you're still behind.

Realize that "benchmarking" is just a fancy way of saying "keeping up." When you benchmark, you're simply identifying the best practices of what others do well and then striving to imitate them. Again, once you reach the benchmarked standards, the company or person that set the benchmark has already moved on to achieve higher standards.

So how do you gain advantage and truly stand out from the crowd? The key is to forget about keeping up and set a new standard for yourself and your company. You can do that by anticipating the future rather than benchmarking what's already been done.

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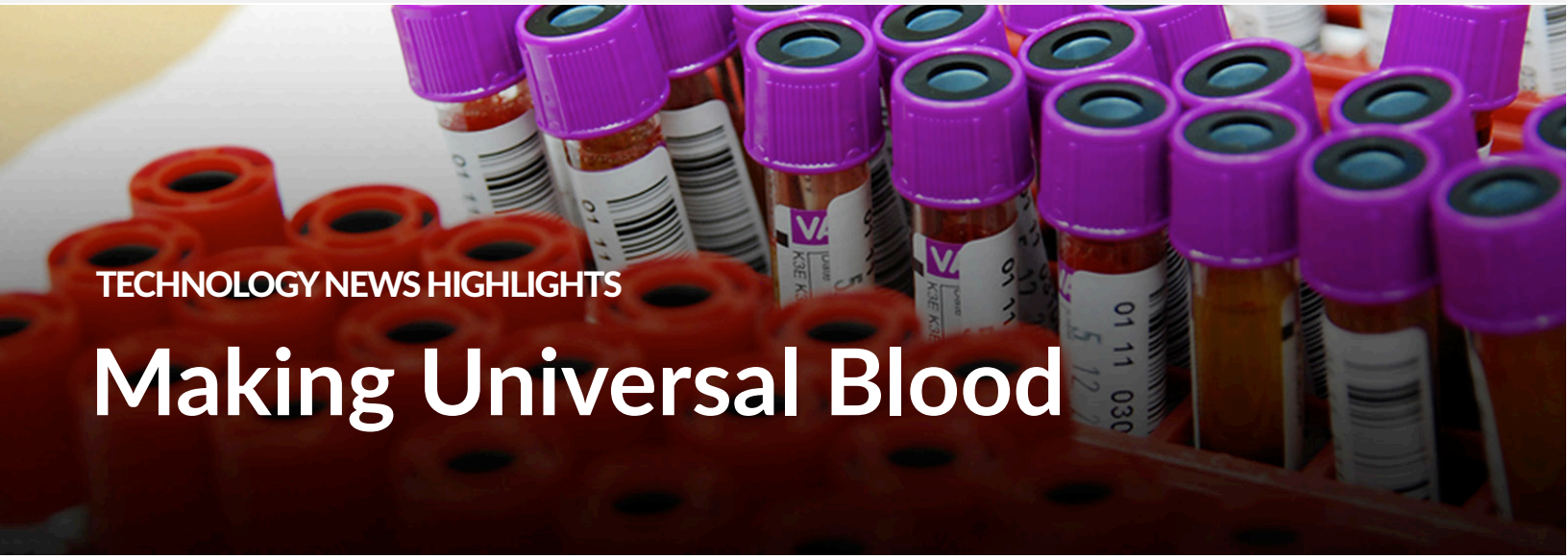

TECHNOLOGY NEWS HIGHLIGHTS

Making Universal Blood

The discovery of enzymes from bacteria in the human gut could someday make blood shortages a thing of the past by turning different types of blood into Type O – the blood type that is universally accepted for transfusion.

Blood is typed into four main varieties (A, B, AB and O) based on different sugars carried on the surface of the cells. Type A blood carries N-acetylgalactosamine; Type B carries galactose; and Type AB has a mix of both. These sugars act like antigens to trigger an immune response when transfused into a person with a different blood type, and the reaction can be fatal. Type O blood, on the other hand, contains none of these sugar residues, making it safe for any recipient.

While researchers have been working since the 1980s on ways to strip antigens from blood cells, the processes have been inefficient, requiring impractically large amounts of enzymes to fully strip away the sugars. The new research focused on bacteria that are known to harvest these same sugars in the gut. In analyzing the bacterial genes, a family of enzymes was discovered that, when mixed with Type A blood, removed the sugars to produce Type O blood 30 times more efficiently than any existing method.

Additional safety testing is needed to confirm the complete removal of antigens and expand the research to include Type B blood as well as all of the possible subtypes of AB blood. But researchers are optimistic that the approach will be effective.

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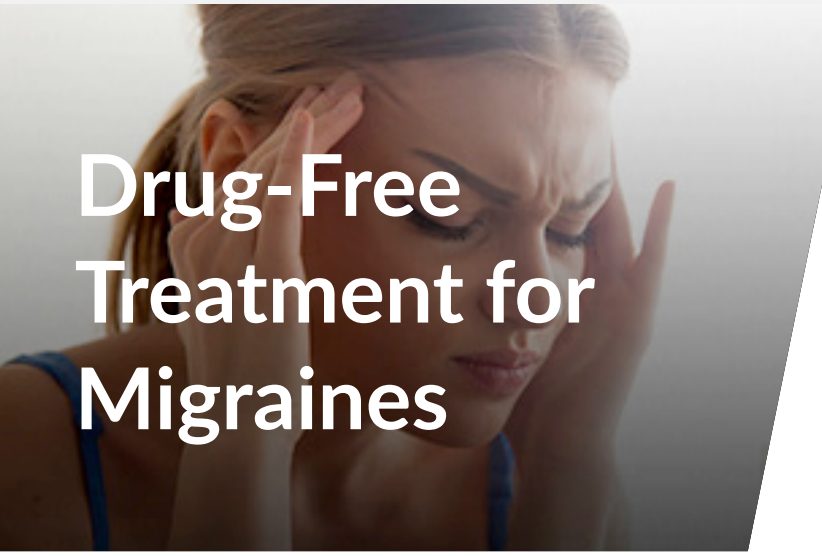

Drug-Free Treatment for Migraines

A limited pilot study of a newly developed inhaler device has shown that simply changing the composition of inhaled air can reduce or even eliminate the need for medications to treat a specific type of migraine known as "migraine with aura." In patients who suffer from this condition, the painful headaches are preceded by vision or sensory changes such as flashes of light, blind spots, or tingling of the hands and face. They are thought to be brought on by a complex chain reaction in which the blood vessels contract, thereby reducing oxygen supply to the brain.

The inhaler is designed to induce a condition called normoxic hypercapnia, in which carbon dioxide (CO_2) levels are increased while keeping oxygen at normal levels. CO_2 is a natural vasodilator (i.e., it expands blood vessels to increase blood flow to the tissues). The new device has been shown to increase oxygen supply to the brain by up to 70 percent, effectively stopping the destructive chain reaction that brings on the painful headaches within a few seconds. The results also appear to increase with use; although only 45 percent of participants experienced an effect with the first use, 78 percent noticed results the second time the inhaler was used.

A larger clinical trial is being planned, which will include migraine without aura and chronic migraine patients.

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Hydrogen-Powered Trains

Just two years after being introduced at the InnoTrans exposition in Berlin, the first two carbon-dioxide-emission-free regional trains have been put into commercial service in northern Germany. Coradia iLint, the world's first passenger train to be powered by a hydrogen fuel cell, was recently put into service along a 100-kilometer line between Cuxhaven and Buxtehude just west of Hamburg. A dedicated hydrogen fueling station at Bremervörde supplies the tanks, which hold enough fuel to travel about 1,000 kilometers.

In addition to the fuel cell, a small battery helps manage power output to maintain continuity and stores energy captured from the regenerative braking system. The electric engine is virtually noise-free, and the only emissions are steam and condensed water.

While railways have long been in need of a

clean-energy solution, the choice of technologies is somewhat limited. Electrification of rail lines is cost-prohibitive on a large scale, and batteries pose a constant trade-off between weight, cost and power output. Although hydrogen is not yet a totally clean fuel (in terms of production), there is a push toward generating it with 100 percent renewables in the future. That fact, combined with its high energy density, make hydrogen the fuel of choice for sustainable heavy rail transport.

The manufacturer of Coradia iLint plans to deliver an additional fourteen trains by 2021.

For information: Alstom, Joachimsthaler Strasse 12/Ecke, Kurfürstendamm, Berlin, 10179; phone: +49-(0)30-330-96380; Web site: https://www.alstom.com/

Mind-Controlled Drones

Using artificial intelligence (AI) to interpret brain signals, researchers have found a way to control drones using only thought patterns. What's more, while other developers have attempted to pilot drones by measuring brain activity, previous systems have only been demonstrated on multi-rotor drones, which can be made to hover while awaiting commands. However, the new technology is fast enough to control fixed wing drones that move continuously through the air.

Fourteen volunteers were trained to pilot the drones by thinking about, but not carrying out, physical actions, including moving their right or left hand, fingers and elbows. An EEG headset recorded the gamma waves that these thought processes activated in the sensory and motor cortex and paired each with a specific drone command. If the pattern was determined to be clear enough, a signal was sent to steer the drone as it flew through the air.

Although the results varied from pilot to pilot, the algorithm was shown to interpret the instructions with an accuracy of 77 to 98 percent.

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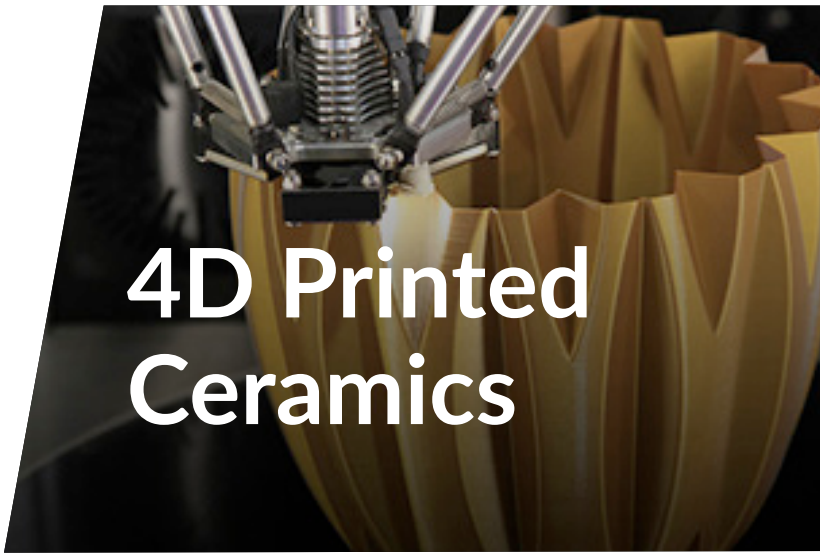

4D Printed Ceramics

4D printing refers to a process for fabricating "programmable" matter, in which a three-dimensional printed object is engineered to react with its environment and transform over time in a predictable manner. For example, a hydro-reactive polymer can be 3D printed to assume one shape when dry and a totally different shape when immersed in water. Depending on the material used, the structures can be made to respond to a variety of stimuli

including heat, light or other external physical forces (stretching or compression). Most of them are made from flexible materials such as plastics, cellulose composites and metals.

Recently, material scientists reported using ceramics to produce 4D structures that, when heated, form a hard, rigid material that is extremely strong and heat resistant. A ceramic "ink" was developed by mixing ceramic nanoparticles with silicone rubber. The ink was used to print stretchy, sheets which were then stretched around a series of joints to form a variety of shapes. When heated to 1000 degrees Centigrade they were transformed into rigid ceramic structures.

Materials such as these could be used to produce strong, complex parts for rockets, satellites, engines and electronic devices that will be exposed to extreme temperatures.

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Non-Addictive Opioids

An experimental opioid drug known as AT-121 has been shown to block pain without any addictive side effects. The new drug works by activating two receptors in the brain: one that targets pain relief – mu opioid peptide (MOP) receptor, and another that blocks the addiction-forming response – nociceptin opioid peptide (NOP) receptor.

According to a recently published study, by suppressing partial activity at both MOP and NOP receptors, AT-121 was more effective than morphine at controlling pain in monkeys, but exhibited none of the side effects associated with addiction, including respiratory depression, hyperalgesia (i.e., increased sensitivity to certain painful stimuli) and physical dependence.

Opioid addiction is considered to be a national health crisis. According to the National Institute on Drug Abuse, in the United States alone, 115 people die from opioid overdose every day. The Centers for Disease Control estimates the total "economic burden" of opioid misuse (including health care, lost productivity, treatment and criminal justice) to be more than $78 billion annually.

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Spoof-Proof GPS

As more and more autonomous vehicles hit the streets, there will be a growing need for GPS systems that are impervious to "spoofing" – the

sending of malicious or accidental signals that can lead them off course.

A new system called Pyramid GPS SP is designed to protect against spoofing and jamming attacks. It combines five antennas and onboard GPS receivers to triangulate the source of received signals and trigger an alert when unexpected directions are detected.

The developer is also expanding its technology to include lidar, radar, cameras and other sensors. In addition to vehicles on the ground, applications include other sensor-dependent systems including sea and air transport, as well as critical infrastructure such as telecommunications, power grids and financial institutions.

The developer is currently working with NASA, automobile manufacturers, drone manufacturers and other corporations to test prototypes with the goal of bringing Pyramid technology to market in 2019.

For information: Regulus Cyber, Ltd.; Web site: https://www.regulus.com/

Wiping Out Malaria... For Good?

In the past, we have reported on a number of applications for CRISPR-Cas9 gene-editing that target specific diseases, mutations or inherited conditions. Now researchers are looking to use the technology to wipe out malaria, but rather than targeting the disease, it would target the ability of the mosquitoes to reproduce.

Using the CRISPR method, scientists have created a "gene drive" – pieces of parasitic DNA that act like a computer virus to copy and paste themselves into the mosquito chromosomes. These chromosomes then get passed on to successive generations, effectively sterilizing the females. In one study of caged mosquitoes, the population was wiped out in twelve generations.

The urgency to find cost-effective strategies for controlling the spread of malaria is understandable. The World Health Organization estimates that there are more than 200 million cases of the disease each year. The nearly half a million deaths reported annually occur mainly among children under the age of five, and survivors often have lasting health problems.

However, there is some disagreement among scientists as to whether or not this is the ideal approach to disease control, as the risk of the gene drive spreading may be too great. Other studies are focused on using gene editing to make mosquitoes resistant to malarial parasites. And the development of a more cost-effective vaccine is still an option that requires more research.

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5 Ways to Move Past Benchmarks

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2. Get off the Treadmill
Rather than keeping up, a smarter way to benchmark means you will look to the future. Most benchmarking practices are based on two questions:

- What path are my competitors on right now?
- What are all the successful companies evolving to?

However, there is a third question to ask yourself – and it's key to moving past the pacesetters:

- What's the likely progression of the industry as a whole?

Asking these questions enables you to go beyond your competition and get off the treadmill of keeping up. It opens your eyes to future possibilities – to stay ahead of the pack instead of side-by-side with them.

In my latest book, *The Anticipatory Organization: Turn Disruption and Change into Opportunity and Advantage*, I reinforce the major competitive edge that comes from the ability to accurately anticipate the future. Think of being anticipatory as a new competency; it's a mindset that teaches you to elevate tried-and-true strategies like benchmarking to new levels.

Unlike traditional benchmarking, which looks backward and measures what has already worked, being anticipatory requires you to look forward. Start with understanding how to identify the directional changes in your industry that are sure to lead to market certainty.

3. Use Hard Trends to Get Ahead
Ask yourself: Is your industry faced with cyclical changes, such as seasonal, economic or sales cycles? If the answer yes, you can expect the normal ebbs and flows that go along with that. But, if the answer is no, there may be even opportunity out there.

Trends that are linear (and not cyclical) present the best opportunity for exponential change. These are trends in technology and innovation that show no signs of slowing down. Think about the future of virtualization, artificial intelligence and the Internet of Things (IoT). How could advances in these areas impact your business?

Another tech trend to spend time thinking through is how advanced cloud storage could free up physical space in your office – and metaphorical space in terms of what you spend time worrying about.

I call the latter Hard Trends, and they are things that are sure to happen based on their upward trajectory and other considerations I talk about in the Anticipatory Organization. The former are Soft Trends, and they are likely to happen but not a sure thing. Knowing the difference can give you a powerful window to the future.

4. Be Better than Best Practice
Remember: Only when you go beyond your competition will you find advantage – and reap the financial rewards of a competitive advantage.

Most businesses do exactly the same thing as their competitors and then wonder why they don't have the upper hand. For example, determine if there's a better customer you can go after – one that's new and different than what everyone else is going after. Can you customize your product or service for this customer so that they would want what you offer and not what

the competitor offers? A process of constant innovation and differentiation provides you with new levels of advantage on an ongoing basis.

Perhaps there was a time when it made sense to play the one-upmanship game of keeping up with the competition. But the dramatic changes spawned by science and technology have made that a perilous game for the present and a formula for disaster for the future.

5. Learn from a Leader

Netflix is a great example of a company that was able to get off the treadmill of trying to compete with the big player in its industry. While Blockbuster worked to maintain its foothold as the largest movie-rental outlet, Netflix was redefining the concept altogether.

Though Netflix began in 1997 by lending or selling physical DVDs to its customers, it already had a technology platform. That is, consumers could order their movies online and have them delivered through the mail. One thing it didn't do was open a brick-and-mortar store.

Ten years later, Netflix added streaming media to its computer mail-order service. Consumer behavior and digital technology took care of the rest and soon, the majority of its content was consumed online, including on tablets and phones. By 2012, Netflix reinvented itself again, this time as a content creator. By 2016, Netflix subscriptions were available in 190 countries, and it hasn't been thought of as a DVD-rental company in at least a decade.

The moral of the story is that while Blockbuster hunkered down in staying competitive, Netflix was using changing technology to redefine and reinvent itself and move well past the original movie-rental giant.

Look Forward, Not Back

The key here is to realize that moving beyond competition into innovation wasn't just a small tweak in order to hit a benchmark; it was a complete change in direction. Netflix didn't even try to compete in the physical space; they made a one-way move and invested in the future of streaming technology instead.

Those who merely "keep up" are usually so caught up in meeting their day-to-day challenges that they can only worry about the future, while the real business innovators see the present as a stepping stone they can use to get to a bigger and better future.

A new world is taking shape before our eyes, and no company can afford to hide out in the old familiar places. While it's important to stay abreast of changes and update your company as new technologies and developments unfold, it's just as crucial to distance yourself from the competition and embrace a forward-thinking mindset that will enable you to turn tomorrow's opportunities into today's profits.

Are you anticipating the future with confidence? If you want to learn more about the Anticipatory Organization, my new book is available on Amazon.com now.

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