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Daniel Burrus'

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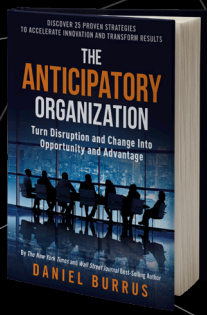
TECHNOTRENDS® NEWSLETTER

The biggest ideas that are changing everything

IN THIS ISSUE

MY NEW BOOK



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4 Questions of World-Class Entrepreneurs

By Daniel Burrus, CEO of Burrus Research

One of the many honors in my career as serial entrepreneur, author and keynote speaker has been my involvement as a keynote speaker at several national and international Ernst & Young (EY) Entrepreneur of the Year Awards, a global competition that fuels and celebrates innovative business thinking. The annual awards were started in Milwaukee, Wisconsin, in 1986 and have now been run in all 50 states and more than 60 countries.

What began as one award that first year – to Scott McNealy of Sun Microsystems – the EY-sponsored competition now averages 400 recipients annually and has been awarded more than 10,000 times. Despite the singular name "Entrepreneur" of the Year, the award is actually plural, with multiple winners each year in recent history.

The competition, which currently brands itself as a celebration of "mold-breakers," is in its 32nd year. Its mission is to honor entrepreneurs who have the boldness to drive change in unexpected ways.

The excitement around these awards is unparalleled. Winners represent virtually every industry imaginable – and some that are still emerging. Industries include retail and consumer products; technology; family business; energy, chemical and mining; food products and services; real estate, hospitality and construction; financial services; digital media; and emerging and transformational.

Notable past winners include John Rothwell of Australian company Austal Ships (2000); David Bussau of Opportunity International (2003), also from Australia; Reid Hoffman and Jeff Weiner of LinkedIn (2011); and Andrew Richardson of Canadian company Targray (2016).

Perhaps most notably, Michael Dell of Dell Computing won the EY Entrepreneur of the Year in 1989, Jeff Bezos of Amazon.com won it in 1997, and Sergey Brin and Larry Page of Google won it in 2003.

> *"One common trait among successful business innovators is motivation.*

The Hunger to Not Be Left Behind

One common trait among successful business innovators is motivation. What do they desire to start and what is their reason for doing so? In other words, what keeps them going?

On the topic of motivation, there is a great story from my time speaking at, and interfacing with, the world's best entrepreneurs, at the very first World Summit for Entrepreneur of the Year Award winners. It was held in Singapore a number of years ago, and the theme was "Access Asia."

The focus was on identifying new opportunities in the region, specifically China and India. As I listened to the speakers from Asia, I noticed that one word kept standing out. They all referred to the tremendous "hunger" of their people to shape their future, grow their economy and enhance their standard of living.

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TECHNOLOGY NEWS HIGHLIGHTS

Smart Helmets

While companies like Google, Apple, Amazon and Microsoft battle over the consumer market for augmented reality (AR) gadgets, the real action may be in the industrial technology sector. Large corporations in the aerospace, oil and gas, automotive and utilities sectors are investing directly in AR systems for field service, manufacturing and material-handling applications that will improve productivity and reduce costs – just as Dan predicted as early as 2000.

For example, Baker Hughes, one of the world's largest oil field service companies, uses AR headsets to remotely diagnose problems and instruct crews on how to conduct repairs by overlaying digital illustrations on real-world images while talking in real time with workers on-site.

The system was co-developed directly with VRMedia and has already saved hundreds of thousands of dollars in travel costs alone.

But the bigger payoff may come in reducing downtime. On average, offshore oil and gas rigs are forced to halt operations for 27 days every year, just waiting for specialists to be flown in, and a typical 200,000-barrel-per-day refinery loses up to $12 million in revenue each day it's offline.

As a result, estimates indicate that by 2022, annual expenditures for AR technology by energy and utility companies alone will reach $18 billion.

For information: Baker Hughes, 17021 Aldine Westfield, Houston, TX 77073; phone: 713-439-8600; Web site: https://www.bakerhughes.com/ VRMedia S.r.l., c/o CERFITT, V.le Rinaldo Piaggio, 32, Pontedera, Italy; Web site: http://www.vrmedia.it/en.html

Super Silk

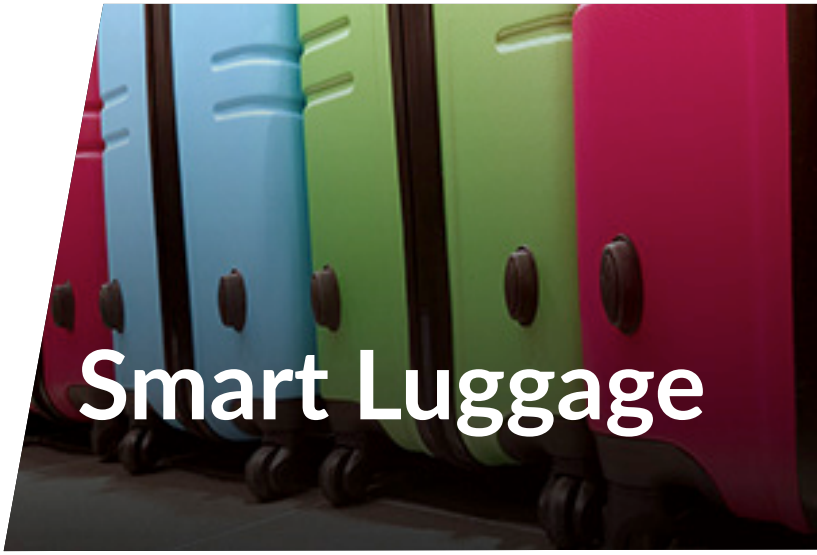
Japanese researchers have found a way to create silk proteins with synthetic components by genetically modifying silkworms. The discovery will be useful for developing new types of medical implants that can act as scaffolds for growing new tissue as well as bandages that promote faster healing.

The use of silk for transplantation in humans is not new. The inert nature of silk proteins means that it causes fewer immune reactions than other materials. However, it also makes it more difficult for other cells to attach themselves.

Past attempts at chemically altering the proteins once they are produced have not been successful, largely because it's difficult to control where the alterations will occur along the amino acid chain. But by modifying the silkworm cells to produce an artificial amino acid (known as AzPhe) in place of a natural one, researchers can ensure that the genetic modification occurs at a precise location.

The modified silk can attach to a variety of molecules, including dyes, tissue cells and antibiotics.

For information: Hidetoshi Teramoto, National Agriculture and Food Research Organization, 3 Chome-1-1 Kannondai, Tsukuba, Ibaraki Prefecture 305-8517, Japan; phone: +81-29-838-8988; Web site: http://www.naro.affrc.go.jp/english/



Smart Luggage

A new remote-controlled suitcase called Puppy 1 is expected to become commercially available this fall. Developed in partnership with Segway, what sets Puppy 1 apart from its competitors is its ability balance on two wheels, making it faster and more maneuverable that other "smart" bags.

The 50-pound-capacity suitcase can travel as fast as 10 miles per hour for about 30 miles on a single charge. The hard-shell case weighs only a few pounds when empty, and with the lithium-ion battery removed, Puppy 1 is FAA-approved as a carry-on. It can be controlled from up to 60 feet away via smartphone or its own remote.

Other features include a fingerprint-scanning lock, exterior lights to make it easier to see and a graphic display screen that alerts the owner when the battery is low.

Puppy 1 will hit the market at a list price around $500, and the company is currently negotiating with Amazon and Best Buy to distribute the product.

For information: Mi Ecosystem, Division of Shanghai Runmi Science and Technology Co. Ltd.; Web site: https://xiaomi-mi.com/mi-lifestyle/

AI for Video Calls

Streaming raw digital video requires large amounts of memory, so smartphones and computers generally compress the data by cutting extraneous information from each video frame.

At slower speeds, this can cause the images to become pixelated and erratic. But a neural network was recently tested that uses less memory by essentially "guessing" what much of the picture should look like and replace portions of it with objects from its own database.

For example, the AI system can recognize a tree from its own library of textures and features. So if an image contains a tree, it deletes that portion from the original image and inserts its own picture of a tree. In a test conducted on 180 subjects, the same images were compressed using the AI algorithm and a standard compression method. Over 80 percent of participants preferred the AI version at very low data rates.

For information: Eirikur Agustsson, ETH Zurich, Computer Vision Laboratory, Sternwarstrasse 7, ETH Zentrum, CH-8092 Zurich, Switzerland; phone: +41-44-63-29420; fax: 41-44-63-21199; email: aeirikur@vision.ee.ethz.ch; Web site: https://www.vision.ee.ethz.ch/en/

Custom Chemistry

Harvard researchers are changing the rules of chemistry. Traditionally, chemical compounds are made by mixing atoms together and waiting for a reaction. But it appears that, for the first time, they have been able to make two atoms bond on command by pressing them together.

The method has implications for all sorts of new compounds, but the process is a little more complicated than it sounds, requiring two laser-controlled atoms at ultra-cold temperatures and a third laser to actually bind them together. The resulting molecule – in this case, a combination of sodium and caesium (NaCs) – has some interesting properties. Because caesium is much larger and heavier than sodium, the molecule naturally rotates, making it useful for applications such as quantum computing. If they can be made to rotate fast enough, the molecules could act as tiny bar magnets, creating an asymmetric magnetic field. And when placed near another molecule, each could affect the quantum state of the other without even touching it.

Although the molecular bonds are currently not strong enough for the new molecules to act as quantum-computing qubits, the researchers believe that can be overcome by reducing vibrations in the bonding system.

For information: Lee Liu, Harvard University, Department of Chemistry and Chemical Biology, 12 Oxford Street, Cambridge, MA 02138; phone: 617-496-2812; email: lliu@physics.harvard.edu; Web site: https://faculty.chemistry.harvard.edu/kni

Collaborative Robots

Building and maintaining a fully robotic manufacturing facility is not nearly as far-fetched as it sounds, thanks to the emergence of a host of new and affordable technologies that enable robots to function as networks rather than as independent machines.

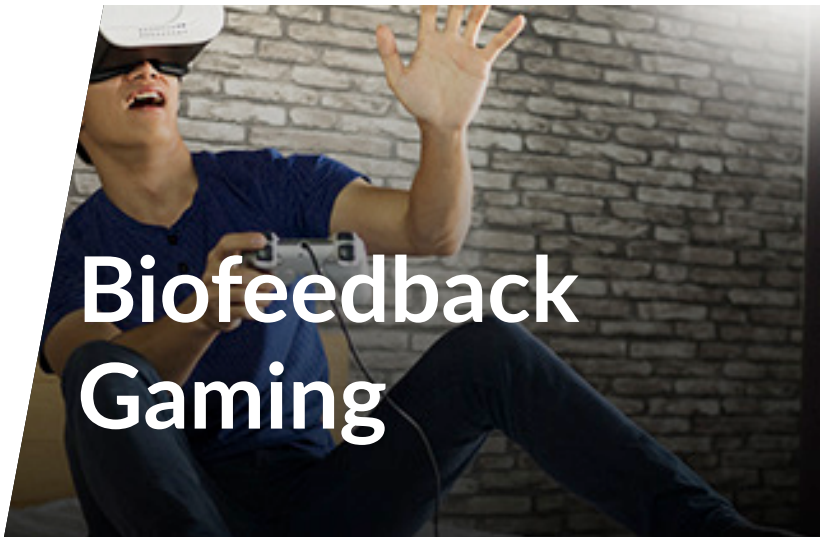
Smart sensors, artificial intelligence and advanced mechanical features are now allowing robots to work together in much the same way humans do, with different machines each performing specific tasks, rather than one robot performing all of the process steps.

One industry that has benefitted greatly from these recent developments is garment manufacturing. Until recently, humans provided the best way to isolate the inevitable variations in color, stretch and weave of soft textiles and adjust their processes accordingly. Today, machine learning enables robots (dubbed Sewbots) to perform many of the same tasks.

All of this translates into cost savings for manufacturers as well as consumers. For example, a single Sewbot assembly line can produce 1,142 T-shirts in eight hours. That's the equivalent to the work of 17 humans.

In addition, cost-saving robots could bring production back to the United States, saving on shipping costs and foreign taxes. And while automated factories will undoubtedly eliminate manufacturing jobs, new technology generally creates new jobs to meet changing business needs.

For information: SoftWear Automation, 665 Eighth Street NW, Atlanta, GA 30318; phone: 844-673-7134; Web site: http://softwearautomation.com/



Biofeedback Gaming

Developers of virtual reality (VR) games are embracing biofeedback as a way to customize the gaming experience based on a player's responses.

By monitoring different combinations of physical parameters such as heart rate, respiration

rate and muscle tension, the aim of many biofeedback-enhanced games is to measure stress levels and adjust what's happening in the game. The goal of the game itself, however, can vary widely.

For instance, Stressjam and Nevermind are two VR games designed to help people learn to better manage stress by placing them in virtual situations that require them to remain calm in order to achieve an objective.

The goal of Deep is to reduce anxiety by lowering heart and breathing rates through a type of guided meditation. On the other end of the spectrum, a new horror game known as Stigma reportedly uses biofeedback to amp up the fear factor if it detects that a player is not "scared enough."

It's not the technology...it's how you use it!

For information: Stressjam: Web site: http://www.jamzone.nl/en
Nevermind: Web site: http://nevermindgame.com/vr/
Deep: Web site: http://www.exploredeep.com/#about-deep
Stigma: Web site: https://www.newscientist.com/article/2165057-horror-vr-game-can-ramp-up-the-fear-factor-if-youre-not-scared/

Wearable Brain Scanner

A new brain imaging system has been developed that allows subjects to move around freely while they're being scanned. The revolutionary device will enable many individuals who could otherwise not be tested – including babies and patients with movement disorders – to benefit from magnetoencephalography (MEG).

MEG maps functional brain activity by measuring the magnetic field generated just outside the skull.

It traditionally requires a person to remain very still inside a scanner.However, the new device is portable and is worn like a helmet. Conventional bulky sensors have been replaced with miniature ones that can be 3-D printed to fit any size head and are attached directly to the scalp.

To date, the device has been tested on four subjects performing tasks ranging from drinking tea to playing ball. Although the monitoring environment must be specially shielded to block outside magnetic fields, there are many potential applications that can be studied, including analyzing brain activity during problem-solving exercises or while communicating with others.

For information: University of Nottingham, Quantum Systems and Technologies, University Park, Nottingham NG7 2RD, United Kingdom; phone: +44-115-951-5151; email: research@nottingham.ac.uk; Web site: https://www.nottingham.ac.uk/research/groups/quantum/research/index.aspx

4 Questions of World-Class Entrepreneurs

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Actions speak louder than words, and the actions that followed made it clear that millions and millions of people throughout that region saw real hope for themselves and their countries. I observed that the young, as well as the old, were excited and engaged in the rapid learning and changing that was going on around them. One motivation was so that they wouldn't be left behind.

Looking back, it seems my observations were spot on. According to the International Monetary Fund, Asia contributed 40 percent of global GDP in 2016. And the Asian economy is projected to deliver nearly two-thirds of global growth in the not-too-distant future.

4 Must-Ask Questions of Business Innovators

In reflecting on the sentiments in Asia at that time, along with the huge amount of progress I have seen in my global career over the past 35 years, I felt compelled to try and boil business ingenuity into four must-ask questions. These are questions we should all be asking ourselves and each other. If we hope to propel America forward the way we have seen our neighbors in the East do it, we should ask:

1. Are We Hungry Enough?

Governments tend to be slow to change, but the governments in China, India and throughout Indonesia saw real opportunity and took unprecedented actions to ensure Asian technology would boost the economy. Cars, smartphones, biotechnology and renewable energy all come to mind as areas of accelerating innovation and growth.

As I listened to my Asian colleagues at the entrepreneurs' summit, I asked myself:

- How hungry are the thousands of American executives who are close to retirement?
- How hungry are the youth of America?
- How willing are Americans to work hard to learn new things, change and grow?
- How ready is America to actively shape a better tomorrow for themselves and the nation?
- How well do American businesses anticipate the future before it arrives?

Let's face it: change is hard for a lot of people. And it's even more difficult if you're on top and really don't want to change. In other words, if you don't have a lot of motivation to do so, why would you use the energy it takes to change?

However, if you see change as opportunity and you open your eyes to the many reasons to have hope for a better tomorrow, change, as well as technology-driven transformation, is welcomed, encouraged and even invigorating, rather than a drain. I have worked with a wide variety of businesses in many different countries, and the motivation throughout Asia is without comparison.

If you have ever observed a person from Asia who has moved to the United States and started a business, you know what I mean. Which brings me to my next question.

2. Are We Ready to Work Hard?

Asian immigrants see the opportunity the U.S. has to offer and they work hard to realize their dreams. The result is a very high success rate. This same hunger for a better future is a major factor driving Asia's growth, both now and well into the future.

The majority of Americans have always had the amazing opportunities of freedom and democracy. We think we are the best, and we show it. All too often, we spend our time defending and protecting the status quo instead of leading change from the inside out.

The result is a much lower level of hunger to learn,

grow and change in order to take advantage of all the new opportunities that are available to us.

One way to jump-start the hard work necessary to take American businesses to the next level is to learn how to anticipate. How often do we spend time developing a concept, product or service to solve a current problem, and by the time the solution is ready, rapid change and disruption has rendered the problem, as well as your solution, less relevant or even obsolete?

One tip I can provide is to learn how to distinguish something that might happen, a Soft Trend, from something that will happen, a Hard Trend. By learning how to separate what might happen from what will happen, you can work both harder – and smarter.

3. How Will We Motivate the Future?
For over 30 years, Burrus Research has not only helped businesses and government leaders worldwide identify and take advantage of amazing new opportunities, we have also helped students and educators understand the opportunities of the future through our education division and scholarships.

I can tell you from our education division working in thousands of schools all over the country, America's youth didn't seem very hungry there for a while. I think that is changing in part because Millennials grew up in households affected by the 2008 recession. And in part because once students can see the tremendous opportunity the future has to offer, they become more optimistic. Optimism fuels an eagerness to learn, grow and change.

History has shown that once Americans clearly see future opportunity on a personal level, they develop the hunger and drive needed to shape the future. Often, it takes a tragic event such as Pearl Harbor, 9/11 or massive layoffs to mobilize us. A major change in White House administrations can also make many of us feel a little off balance; it's how well we see the opportunity created by major change that makes the difference.

The good news is that we don't have to wait for the other shoe to drop. As leaders, we can create hunger in our people by helping them to clearly see the personal opportunities that accelerating change and digital transformation present. Yes, I said personal. If we only discuss organizational opportunities, we will never create hunger. If we create a vision that individuals can relate and aspire to, then change is seen as positive and the result is action.

4. Do We Know Where to Start?
Ask yourself: Do I have a strategy to create a personal hunger for my employees or students? If the answer is yes, great! I'm sure many of your peers and colleagues would love to hear the secret to your success.

If the answer is no, it might be time to form your own network of like-minded innovators and brainstorm together. In today's age, social media provides us with a free, always-open channel of communication.

Consider logging on to some Twitter chats hosted by business authorities you admire. Don't just connect on LinkedIn, communicate there. And by all means, continue to learn from each other the old-fashioned, and still the best, way – face to face.

If you still want some help getting started, you might want to read The Anticipatory Organization, my latest book I wrote to help you learn to see the many opportunities that are now available to actively shape a better future for yourself, your family, your organization and your country, and most importantly, to have the confidence to leap into action.

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