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TECHNOTRENDS® NEWSLETTER

The biggest ideas that are changing everything

IN THIS ISSUE

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Identifying and Developing Opportunities in Uncertain Times

By Daniel Burrus, CEO of Burrus Research

A well-worn cliché says there are only two things you can be certain about: death and taxes. With apologies to those who agree with that statement, there are many, many more examples of out-and-out certainties. Was Sunday followed by Monday last week? Absolutely. Will that be the case next week? You can count on it.

A timelier and, in some ways, comforting example involves the ever-changing situation we find ourselves in today with COVID-19. This pandemic has seemingly pressed "pause" on time, stifling businesses in many ways and rattling humankind as we're told that each day is fluid and completely unsure of what the next day will bring for business and humankind overall. Monday will still follow Sunday, but will it be business as usual? Right now, the answer is no.

> *This virus will end, and that is a fact; it will happen.*

However, if Hard Trends, or future certainties, are as easy to identify as I maintain, what is the Hard Trend in all of this?

It's as obvious as my days-of-the-week anecdote above: This virus will end, and that is a fact; it will happen. Because of this, you better believe that, aside from the length of the coronavirus's impact, there are still Hard Trends in every industry, plus plenty of opportunity in the disruption that is this global pandemic.

In order to be able to identify Hard Trends during these unprecedented times, we must diagnose the very concept of Hard Trends and how they can lead to significant game-changing opportunities for you and your organization.

What's a Hard Trend?

As previously stated, a Hard Trend is a future certainty in that it is something we know is going to occur whether we want it to or not. The opposite of Hard Trends are Soft Trends, which are future possibilities that may or may not take place.

In the case of Soft Trends, these can be changed to your and your organization's benefit, whether that be by way of innovation to diversify and increase profits or, during a global pandemic, to keep your doors open in unique new ways while making your employees and, if you have them, in-person customers feel safe and comfortable returning.

To further explore my Hard Trend Methodology and how it can help you be more anticipatory during times like we currently face, I have grouped Hard Trends into three primary categories for identification purposes.

Demographics. This can be age, race, gender or any other defining characteristic of a

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TECHNOLOGY NEWS HIGHLIGHTS

New Uses for Augmented Reality

One effect of the coronavirus pandemic that many people didn't see (probably because they failed to look) is an explosion of ingenuity in designing new uses for existing technologies that will not only carry us through this time, but make our lives better in the future.

For example, a new application for augmented reality (AR) – a technology that allows users to interact with the real environment through a holographic headset – has taken on a crucial role in healthcare by guiding clinicians through critical tasks, such as how to operate a ventilator. It also enables physicians to offer remote assistance when they cannot be present at the patient's bedside.

In another application, an Internet broadband company is using a remote AR service solution to help technicians guide customers through setup and troubleshooting requests during a time when social distancing has precluded them from entering people's homes.

As a result of these, and other new ideas for using AR to enable productivity during the shutdown, at least one company has seen use of its AR headset technology increase 13-fold since January. Projections indicate that augmented and "mixed reality" headset usage by employees in the U.S. will increase from 25,000 in 2019 to a whopping 8.6 million by 2028.

For information: Sheba Medical Center, Derech Sheba 2, Ramat Gan, Israel; phone: +972-3-530-3030; Web site: https://www.shebaonline.org/
Help Lightning, 1500 First Avenue North, Birmingham, AL 35203; phone4: 800-651-8054; Web site: https://helplightning.com/
Forrester Research; Web site: https://go.forrester.com/

COVID Breathalyzer

Researchers are reportedly working on a testing system that will detect COVID-19 in exhaled air. The device would be faster, less expensive and far more pleasant than the deep nasal swabs and associated laboratory analysis currently required. In addition, the tests would not need to be performed by specialized medical personnel.

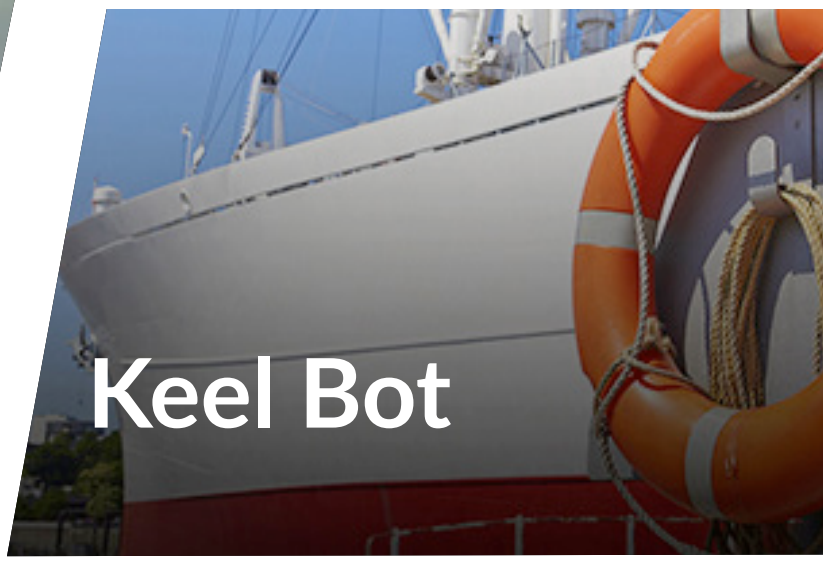
The new device analyzes a sample breath for the presence of nitric oxide and two other metabolites that may be indicators of infection even before symptoms appear.

The technology could help with early detection as well as monitoring the severity of disease as it progresses, enabling more timely intervention and therapy, and improving outcomes.

The goal is to make an inexpensive, handheld monitor that can display the results directly and/or transmit them to a physician.

Ultimately it might be used to screen travelers before boarding a plane or to test students before entering a classroom. With the selection of appropriate biomarkers, the platform may also be modified for other diseases including diabetes, cancer or Alzheimer's.

For information: Perena Gouma, Ohio State University, Materials Science and Engineering, Watts Hall, 2041 N. College Road, Columbus, OH, 43210; phone: 614-292-4931; email: gouma.2@osu.edu; Web site: https://mse.osu.edu/



Keel Bot

The buildup of shellfish and seaweed on a ship's hull is more than an eyesore or inconvenience. It costs ship owners money by increasing drag, which in turn increases fuel consumption. It also takes a toll on the environment by increasing greenhouse gas emissions.

According to one shipping economist, hull cleaning can reduce fuel usage by 9 to 17 percent, depending on how thoroughly it's done. Traditionally, cleaning is performed by divers (sometimes assisted by robots) at scheduled times. But a new invention called HullSkater aims to eliminate the need for divers altogether.

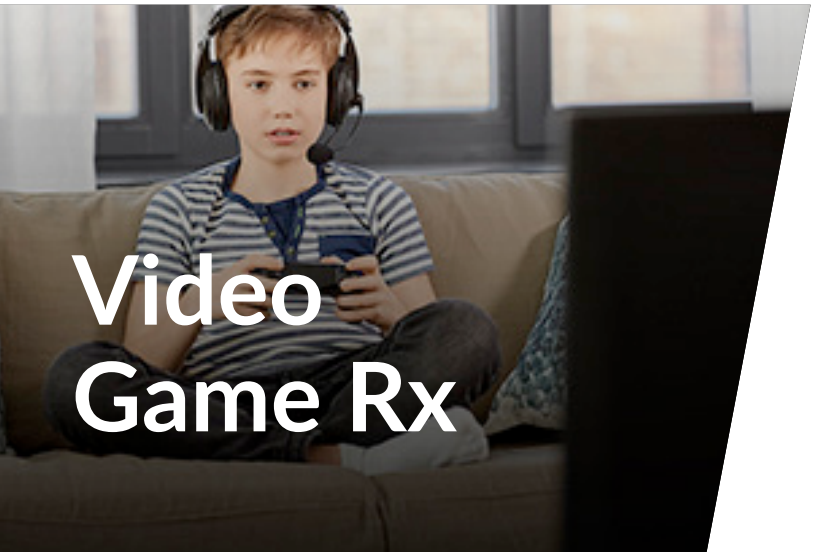
The 440-pound (200-kilogram) robot is designed to reside permanently onboard and be deployed whenever the ship is in port. Magnetic wheels clamp it to the hull where it can be controlled remotely, via a 4G connection, by an operator anywhere in the world.

Cameras provide a view of the hull and

special brushes clean the nooks and crannies where slime-producing bacteria can accumulate. Eliminating these biofilms helps to keep the hull clean by preventing barnacles, mollusks and seaweed spores from attaching themselves.

It's estimated that more regular cleaning (as opposed to episodic semi-annual cleaning) will result in a sustained fuel savings of 12 to 13 percent – an average of $800,000 annually. In addition, HullSkater will reduce the migration of alien and invasive animal species to ecosystems throughout the world.

For information: Semcon, Lindholmsallen 2, 417 80 Goteborg, Sweden, phone: +46-031-721-0000; Web site: https://semcon.com/ or https://semcon.com/jotunhullskater/



Video Game Rx

The U.S. Food and Drug Administration recently approved the first prescription video game for children ages 8 to 12 who have been diagnosed with attention deficit hyperactivity disorder (ADHD).

Called EndeavorRx, the game has undergone five clinical studies comprising more than 600 subjects and spanning a period of seven years. In one study, after playing the game for 25 minutes per day, five days per week for four weeks, one-third of participants no longer displayed attention deficit on at least one of the measures typically used to define objective attention. In addition, the improvements lasted for up to a month following treatment.

The game consists basically of dodging obstacles and collecting objects. The proprietary technology targets specific neural systems in the brain that are associated with cognitive dysfunction.

Common side effects of frustration and headache were mild compared to traditional drugs. Although the developers stress that EndeavorRx is not a substitute for established treatments, it does provide another alternative. And while this is a first for ADHD, virtual reality has been studied previously to ease pain in burn victims, and could one day provide help for other diseases like Alzheimer's.

For information: Akili Interactive, 125 Broad Street, 5th Floor, Boston, MA 02110; Web site: https://www.akiliinteractive.com/ or https://my.akili.care/endeavor/enrollment

Ultra-Secure Satellite

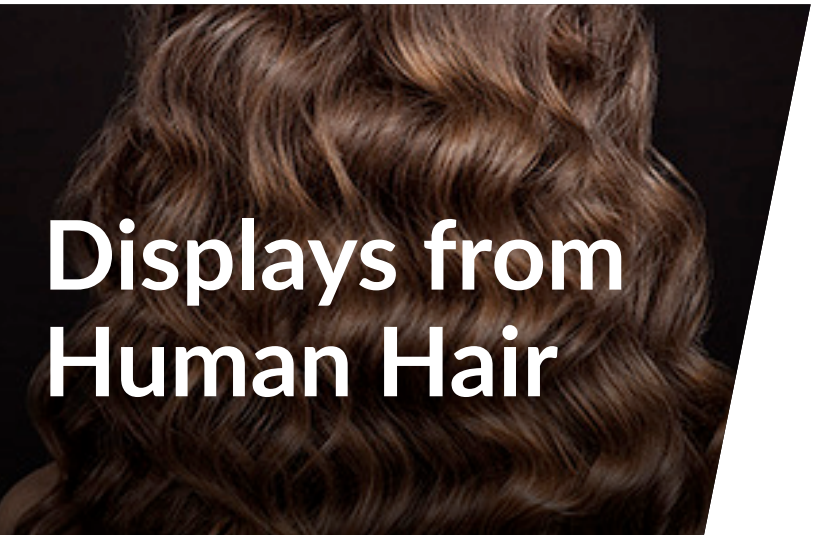
The ever-growing array of communication satellites is a hotbed for hacking and jamming between the world's superpowers.

But Chinese scientists may have developed an unbreakable link between a satellite and earth using a "secret key" for encoding and decoding data.

The technique uses something familiar to TFN readers known as quantum entanglement – a property that enables two photons to be instantaneously linked even if they are separated by a great distance. Furthermore, the particles cannot be read without changing their content, making them inherently un-hackable.

Although earlier tests have demonstrated the potential for quantum satellite communications, this most recent work shows an unprecedented level of efficiency that places China a few years ahead of the rest of the world.

For information: Jian-Wei Pan, University of Science and Technology, 1129 Huizhou Avenue, Baohe District, Hefei, Anhui, China 230052; Web site: https://en.ustc.edu.cn/



Displays from Human Hair

Hair is a natural source of carbon and nitrogen, both of which are needed to produce light emitting particles. Now a process that converts human hair into a new type of flexible display could turn a waste problem into a valuable material.

The method, developed by Australian researchers, breaks down hair collected at a local barbershop and heats it to 240 degrees Celsius (about 465 degrees Fahrenheit). This removes the proteins and keratin, leaving a material with a molecular structure that contains both carbon and nitrogen. These carbon nanodots self-assemble into small groups dubbed nano-islands, which can be used to form the active layer of an organic light-emitting diode (OLED). When a small voltage is applied, the device glows with a blue color.

The displays could be used for smart labels to indicate expiration dates on food items. They might also be used in wearable devices, or even as sensors for certain chemicals. The next step is to determine whether hair from other animals will provide similar results.

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Self-Healing Rubber

A new rubber material that can repair itself completely in as little as a few minutes has been created from industrial waste products that are not only cheap, but are also readily available – namely, sulfur, canola

cooking oil and a by-product of petroleum refining called dicyclopentadiene (DCPD). When damaged, a chemical catalyst can be applied to two pieces allowing them to actually bond together, so instead of a patch, it forms a single piece.

The material could be used to create a host of flexible, repairable and sustainable products, including tires. In nearly every corner of the world, disposal of old tires is a growing concern. But tires made of self-healing rubber could be easily and permanently repaired without compromising integrity.

Because it's also resistant to water, salt and corrosion, the new rubber can be used in marine applications. Other uses include making bricks for constructing buildings without the need for mortar. And best of all, it's totally recyclable and can be used over and over again.

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One-of-a-Kind Drug Therapy

A new paradigm for creating personalized drugs could revolutionize how we treat rare genetic conditions. In one case, a young girl named Mila was suffering from an inherited disorder, called Batten disease, in which the proteins that carry away cellular waste products fail to function properly. This results in eventual cell death that leads to seizures, cognitive impairment and blindness.

But doctors were able to identify a particular genetic sequence, called a transposon (also known as a jumping gene) that can interject itself at various locations in the DNA chain. In Mila's case, the position of the transposon was preventing her cells from replicating properly.

So they created a customized piece of RNA that could bind to the genes like a molecular bandage (also known as an oligo). Dubbed Milasen, the new drug enabled the cells to reproduce normally and stopped the build-up of cellular waste. Mila's seizure activity has been reduced and, with help, she is now able to stand and walk.

It took less than a year to develop Milasen, and now that the process is established, others will undoubtedly follow, as oligos are relatively easy to create. The technique is applicable to medicines that fix erroneous messages (such as Batten disease) as well as others which might replace or edit genes, offering hope where there once was none.

For information: Timothy Yu, Boston Children's Hospital, 300 Longwood Avenue, Boston, MA 02115; phone: 617-355-6000; Web site: http://www.childrenshospital.org/ or http://www.childrenshospital.org/research/batten

Mila's Miracle Foundation, P.O. Box 19675, Boulder, CO 80308; Web site: https://www.milasmiracle.org/

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group. During this pandemic, an example is an older generation like the Baby Boomers. The fact that they are more susceptible to COVID-19 is a definite Hard Trend.

Now, if we were to examine demographics during regular times, a more obvious Hard Trend to both Baby Boomers and every living being on this planet is that we all age.

In several industries, this Hard Trend should be recognized, and a great question posed by said Hard Trend is: How are you appealing to both your aging customer base that has been by your side possibly from the beginning and much younger generations that will age alongside your company?

I've seen many leave their new customers out in the cold solely because they are stuck in a paradigm of appealing only to their older customers. One example is Harley-Davidson. Until recent years, the image it gave to the world was that Baby Boomers rode Harleys.

With millennials now getting older, and even Generation Z coming up behind them, Harley began to pivot as it observed the younger generation taking less interest in baggers and more often than not, wanting something classic like a Sportster, which fits more closely to their lifestyle, based on both income and environment.

The mindsets of different generations are similar in some ways and different in others, and this must be taken into account.

Government Regulations and Oversight. For this category, a broad question immediately comes to mind: As a general rule, will there be more or less government regulation in the future?

If we've learned anything from the coronavirus pandemic, it is that there will definitely be more. As new innovations emerge amid the lockdown, new governmental regulations will evolve in response to them. This is true, regardless of the industry or organization, this a Hard Trend.

This poses the question of how you evolve with this Hard Trend. For example, maintaining social distance and staying six feet from one another is encouraged, but not yet mandated. But what happens if and possibly when it does?

We all can think of the ways shoppers in a grocery store can easily maintain social distance, but what about those businesses that function solely on physical interaction with individuals, such as massage therapists, hair and nail salons, and even self-defense gyms?

How about employees in offices? Does it make more sense for them to continue to work remotely indefinitely to minimize the chances that individuals who absolutely have to be there physically will cross paths with others unnecessarily?

Technology. Believe it or not, some of the answers to those questions in the government regulation and oversight area are answered by the technology that will emerge due to the Three Digital Accelerators I have frequently discussed since the '80s: processing power/computing power, bandwidth and storage.

From the ever-increasing accessibility of 3D printing to holographic telepresence, technology is inevitably going to become more functional, more sophisticated and more widespread.

In addition to how we have learned to use already existing technology during the pandemic, this makes technology in any capacity a Hard Trend; we will always be finding a newer, better way to accomplish a task or create something.

Many companies will find how much overhead expense they save themselves having a more remote workforce, and while current technology such as Zoom Video Communications or Microsoft Teams facilitates many white-collar jobs to easily go remote overnight, as we observed at the start of this pandemic, think of a world where a machinist can do his job via Augmented Reality (AR) at home as well.

The benefits of remote work are tremendous, both for proven productivity of employees and for cutting down on unnecessary travel. But in addition, younger generations of workers who strive to have more of a work-life balance will likely be happier at jobs that they ordinarily would be less inclined to apply for, again resulting in increased productivity.

Why Hard Trends Matter

Knowing that something is a future certainty means so much more in times like these. It's central to your organization's planning and subsequent execution of innovation, even during an economic shutdown.

Along with the ever-changing spectrum of this pandemic and subsequent lockdown, being aware of the Hard Trend of growing government regulation allows you to become more anticipatory with those additional guidelines foremost in your mind, allowing you as an organization to continue to progress and grow.

Leveraging Hard Trends to your advantage is how you can also pre-solve problems before they exist. Case in point: When the United States government mandated a stay-at-home order, closing the physical operations of many nonessential businesses, many threw up their hands in frustration, while others decided to adapt and overcome, taking advantage of opportunities to continue to operate during a shutdown—and profited accordingly.

What you can expect is that Hard Trends—identified and acted upon—can offer enormous opportunities for those organizations with the mindset of always keeping their eyes open to the future.

Is your organization identifying and acting on the visible Hard Trend certainties in your industry during COVID-19? Better yet, are you learning how to be an anticipatory leader in all of this?

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