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Daniel Burrus'

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# TECHNOTRENDS® NEWSLETTER

*The biggest ideas that are  
changing everything*

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A portrait of Daniel Burrus, a man with glasses and a beard, wearing a suit and tie. He is smiling slightly. The background of the entire page is dark with a network of white dots and lines, resembling a molecular or technological structure.

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# Decipher Your Disruptions: How to Better Navigate a Digitally Transformative World

*By Daniel Burrus, CEO of Burrus Research*

I want you to take a moment and ask yourself this extremely important question: are you afraid of change?

What was your answer?

Many answer with a flat-out “yes,” indicating that they are horrified of their status quo being disrupted in any way, shape, or form. Some may answer “yes, depending on the circumstance,” indicating they only fear change if it disrupts something specific in their lives. And a select few answer “not really” or “not at all.”

Are those individuals who answered “no” to fearing change fearless? Odds are that they are not; everyone fears something. However, change not being one of their fears is most likely a result of them being Anticipatory as a business leader and an individual in society today.

An Anticipatory mindset helps mitigate the fear of change, one of the most common fears nearly all species on Earth experience in their own way. Our fear of change stems from a primordial place of survival; when our environment shifts, we feel vulnerable to danger, whatever that danger may be.

*In today's world, the most prominent force of change is digital disruption*

## What Causes Change Today?

If you identify that you do fear change in some way, understanding where change most commonly stems from in business and everyday life is a starting point

in overcoming this fear.

In today's world, the most prominent force of change is digital disruptions: developments in technology that displace jobs, products, services, and nearly anything you can imagine. Business leaders, entrepreneurs, and employees alike know this is a Hard Trend future certainty that will happen. Advancements in digital technology will continue to accelerate at an exponential rate, cementing the phrase “change is the only constant” even more permanently in the sands of time.

In the early eighties, I identified what I refer to as the Three Digital Accelerators. These include processing/computing power, bandwidth, and storage. These accelerators are the driving force behind digital disruptions changing consumer behavior, business processes, and the job market. Essentially, they drive change in every facet of the world, which no one is immune to.

## The Fear of Digital Disruptions

Because digital disruption impacts every single industry in one way or another, those who fear change now really fear change, working tirelessly to protect and defend their status quo. Daily, they may reassure themselves that what has worked will continue to work, a mindset based on the philosophy “if it isn't broken, don't fix it.”

Take, for example, an industry that was ripe for disruption: travel and lodging. Not even a decade ago, if you planned a family vacation, you stayed

*continued on page 8*



## TECHNOLOGY NEWS HIGHLIGHTS

# Paper from Grass

As the demand for single-use plastic packaging continues to decline, the popularity of paper packing is on the rise.

But traditional manufacturing methods that use wood pulp require large amounts of water, chemicals, and energy, so paper makers are turning to more sustainable alternatives.

One option is grass — a raw material that can be sourced virtually anywhere, from backyards to abandoned cattle farms.

When dried into hay, it can be processed into pellets that are drop-in replacements for wood pulp at paper mills. Known as “grasspap,” the product has been tested at some smaller mills with good success.

The new material cuts water usage during paper production by 99 percent and reduces overall energy requirements by 97 percent. It also eliminates the need for chemicals such as sodium phosphate that are traditionally used to break down the wood fibers. In addition, grass regrows more quickly than trees, creating a more sustainable flow of raw materials.

The resulting paper can be used for a variety of products by varying the ratio of wood pulp to grass pulp, including bags, cardboard, and tissue paper.

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# Eliminating Microplastic Waste

Research has confirmed that tiny fragments of plastic debris have made their way into every corner of our environment. They're in our oceans, our soil, our food, and even the air we breathe. Known as microplastics, these miniscule particles contain trace metals and chemicals that can leach out with potential toxic effects.

One approach to cleaning them up is by using microrobots — devices the size of a bacterium that attach themselves to microplastics and begin breaking them down. The tiny metallic robots are shaped like a four-pointed star and coated with magnetic particles. When placed in water along with a small amount of hydrogen peroxide and exposed to light, they can move through the water adhering to the plastics, while charged molecules produced through photocatalysis break down the chemical bonds. The microrobots can then be collected using a magnet.

Further testing is needed to determine whether the bots are safe for long-term use, and to study what other substances might be affected by them. Until then, the most effective way to reduce microplastics in the environment is to stop them from getting there in the first place by reducing our use of plastics, synthetic fabrics, and other petrochemical materials.

For information: Martin Pumera, University of Chemistry and Technology, Nanorobots Research Center, Technicka 5, 160 00 Prague 6 – Dejvice, Czechoslovakia; Web site: <https://www.vscht.cz/home> or <https://www.nanorobots.cz/#home>



# Brain Pacemaker

Deep brain stimulation (DBS) is widely used to treat debilitating neurological symptoms of diseases like Parkinson's, and devices that selectively deliver stimulation to the brain in response to abnormal activity are already being used to successfully treat drug-resistant epilepsy. But a recent study indicates that the technology could also help people suffering from severe depression.

The patient studied is a 36-year-old woman who was experiencing suicidal thoughts several times an hour. Numerous tests were conducted to determine what electroencephalographic (EEG) brain patterns should trigger the device and where the implant should be positioned within her brain. Within a few months of receiving the implant, the patient was entering remission from her depression with no thoughts of suicide.

Although this preliminary report represents a single subject, the researchers are hopeful that their targeted approach to DBS will yield similar results in future subjects as well. Unlike traditional DBS system that have been tried



as a treatment for depression, this method is fine-tuned to each individual. And rather than delivering continuous stimulation 24 hours a day, the new technique stimulates the brain only when symptoms warrant.

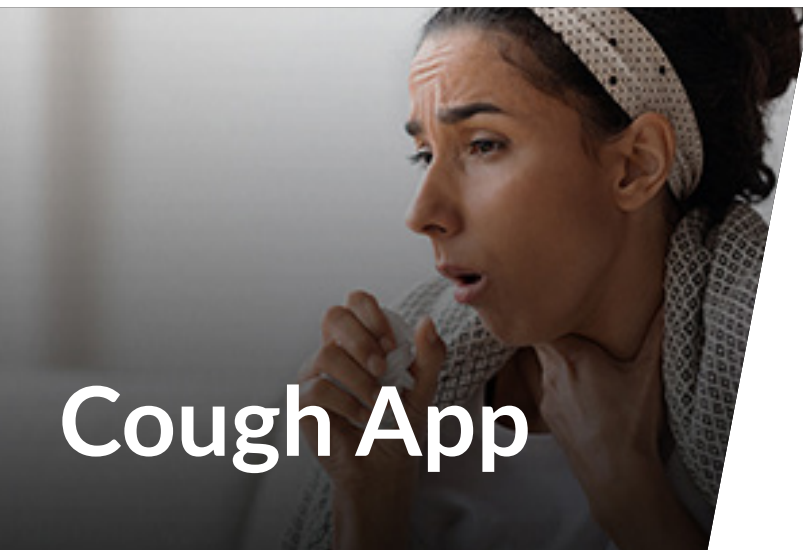
The trial will continue to follow the patient to determine how long the implant will be needed. The researchers also plan to enroll additional patients in order to evaluate the effectiveness of the system for a broader range of etiologies.

*For information: Katherine Scangos, M.D., University of California-San Francisco, School of Medicine, 401 Parnassus Avenue, A307C, San Francisco, CA 94143; Web site: <https://www.ucsf.edu/> or <https://www.ucsf.edu/news/2021/09/421541/treating-severe-depression-demand-brain-stimulation>*

more than 96 percent. The system can distinguish between a variety of cough-related conditions including COVID-19, influenza, asthma, chronic obstructive pulmonary disease (COPD), and gastroesophageal reflux.

Known as Hyfe AI, the system provides important diagnostic information in real time so that cough sounds can be detected, monitored, and classified objectively. Subtle changes that could be important for determining the long-term impact of therapy or the onset of new symptoms can also be tracked. The availability of reliable metadata — such as location, time, and frequency — allows these additional variables to be identified and correlated. But, perhaps more importantly, Hyfe AI can be deployed at any scale anywhere in the world for improved screening and risk management.

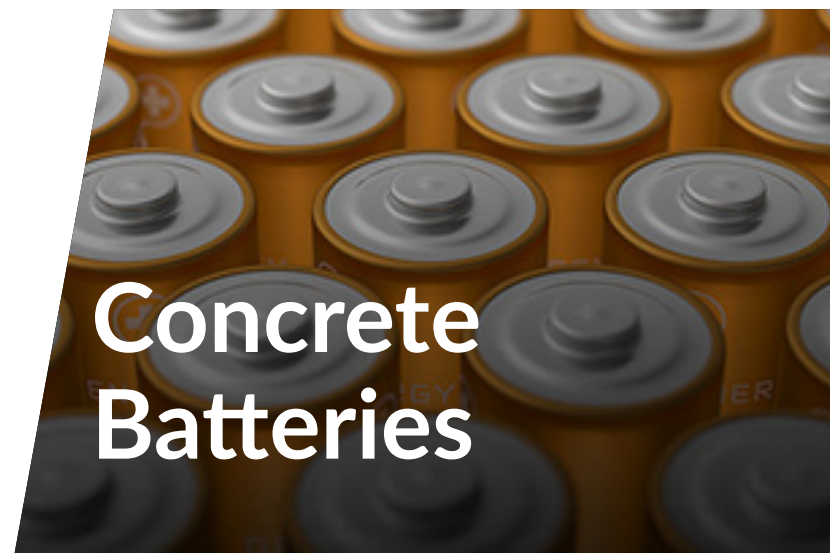
*For information: Hyfe Inc., 1209 N. Orange Street, Wilmington, DE 19801; Web site: <https://www.hyfe.ai/>*



## Cough App

Researchers are using the power of smartphone technology and artificial intelligence (AI) to analyze and monitor cough sounds. The technique could potentially provide early detection of respiratory illness — a leading cause of death and disability worldwide. It may also one day help to predict future outbreaks of diseases such as COVID-19 or tuberculosis.

In a preliminary trial last year, the cough detection algorithm was used to examine nearly 700,000 sound samples with a sensitivity and specificity of



## Concrete Batteries

A new approach to a century-old design could someday make batteries out of buildings. The nickel-iron battery, patented by Thomas Edison in 1901, is a robust system that can be charged and recharged without compromising its performance, and can last for decades. This basic design is now

being used to turn concrete into power storage cells, which can, in turn, be used to construct buildings.

Instead of an electrolyte solution, carbon fibers are mixed in with the cement. Layers of carbon fiber mesh coated with nickel or iron act as the cathode and anode. The batteries would be used to store energy generated from renewable sources like solar and wind. So far, the concept has proven to be capable of charging, discharging, and recharging; however, the batteries can only hold a small fraction of the power of a traditional battery.

In the current design, 200 square meters (over 2,000 square feet) of concrete would be needed to provide about 8 percent of the electricity used in a typical home. But cement-based concrete is the most widely used solid material in the world, and a single material that can provide both shelter and power could be a game-changer.

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polluted with toxic chemicals from munitions. When they leach into groundwater, these chemicals can cause serious health problems including seizures and even some types of cancers.

Now biologists are looking at cleaning up these hazardous substances using genetically modified switchgrass, starting with an explosive known as RDX. The new grass variety contains two genes from a bacterium that reduces RDX into non-hazardous substances by producing enzymes to break it down.

In experiments that compared areas planted with the modified switchgrass with those where only wild plants or no plants grew, water and soil samples showed significant reductions in RDX. In addition, although RDX appeared in the wild, unmodified plants, it did not appear in the tissues of the modified switchgrass, so it was not toxic to the new plants.

Further research will focus on transforming other species, including wheatgrass, to remove RDX from the environment, with the goal of maintaining biodiversity.

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It's been estimated that nearly 25 million acres of land used for firing ranges in the U.S. has been

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# Virus Detecting Mask

A new device that combines disposable masks with biological testing circuits could soon be used to detect COVID-19 as well as other disease-causing viruses and chemical agents.

The masks utilize synthetic biological sensors to detect genetic sequences. In the past, these types of sensors have required the use of living cells, which poses a biohazard risk. But a new method has been developed to make freeze-dried, cell-free circuits that can be applied to porous materials like textiles and paper.

When hydrated and exposed to a person's exhaled breath — which is a convenient non-invasive source for sampling organisms like COVID-19 — an enzymatic reaction releases a fluorescent protein within 90 minutes of activation.

Sensitivity of the test is similar to other tests for COVID-19. The developers hope to commercialize the single-use masks at a targeted price of \$5.00.

*For information: James Collins, Massachusetts Institute of Technology, Department of Biological Engineering, 77 Massachusetts Avenue, Cambridge, MA 02139; phone: 617-324-6607; email: [jimjc@mit.edu](mailto:jimjc@mit.edu); Web site: <https://www.mit.edu/> or <https://www.collinslab.mit.edu/>*



# Robot-Powered Pizza Restaurant

A new pizza chain is on the horizon that will utilize robotics to deliver a more affordable pizza without sacrificing quality. The restaurants will be built around an existing robotic system known as the Picnic Pizza Station, which automates the pizza-making process to deliver a consistent product while reducing food waste.

The new restaurant, called PizzaHQ, further automates the process by interfacing directly with the customer order. Once the pizza is baked, cut, and boxed, it's loaded into a delivery van to be transported to heated pickup lockers at various locations around the city. Customers can then pick up their order by scanning a QR code, or they can utilize third-party delivery services like UberEats to collect their pizza and deliver it.

The planned proof-of-concept model will include a central hub (consisting of four Picnic systems and 50 employees) and five fulfillment centers (with two robots and ten employees each). Service is anticipated to start in the first quarter of 2022 in the area of Totowa, New Jersey. After that, the owners plan to replicate the model in metropolitan areas across the country.

*For information: PizzaHQ: Instagram: [https://www.instagram.com/PizzaHQ\\_/](https://www.instagram.com/PizzaHQ_/)*



# Decipher Your Disruptions: How to Better Navigate a Digitally Transformative World

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in a hotel. The only way to combat the cost of lodging was to stay with a family member or friend, contingent on if they had adequate space to house you and your family, if they even lived in the area of your vacation destination.

No one ever thought that connecting with complete strangers via a mobile device would act as family members or friends in that above equation, especially the bigger hotel chains, but it became so. Airbnb burst onto the scene, allowing individuals the ability to rent a room in a house for much less than a hotel room. Suddenly, everyone “could stay with a friend” anywhere they planned to travel and save money on exorbitant resort fees. As a result, hotels began to suffer.

Even prior to the hyper-connectivity of our mobile devices and the emergence of apps like Airbnb, travel agencies began shutting their doors as websites like Expedia, Kayak, and Travelocity streamlined the ability for an individual to plan their own trip via their home computer, including lodging, a vehicle rental, airline tickets — anything you can imagine.

The reality is: what isn't broken eventually will be by digital disruptions, and burying your head in the sand and pretending that the world is not advancing digitally is most definitely not the answer.

Digital disruption and change is a Hard Trend, but trust me when I say this is a positive thing ripe with opportunity!

## What Can Disrupt You?

The fear of change is prompted by uncertainty and discomfort, but knowing that digital disruption in and of itself is a Hard Trend future certainty that will happen.

However, I understand that does not completely eliminate your fears. After all, there's no way for you to know specifically what will disrupt you, only that you can be disrupted, right?

Wrong!

You can decipher what will disrupt you by using that same Hard Trend Methodology that you've used to come this far in the process! Here's how:

**Education** — First, accept that education is a never-ending process. We never stop developing and learning throughout our entire lives, and this correlates directly to the fact that change is the only constant! If nothing changed, innovation would cease to exist.

To simplify: we would still be in the stone age, unable to communicate verbally to one another because the human being would have never learned to speak. We might be extinct, actually!

Always educate yourself on what's changing inside and outside of your industry. Identify new, transformative technologies and familiarize yourself with the nuts and bolts of how they work, just like when you first learned about the nuts and bolts of your profession.

**Identify** — Second, identify how each of those technologies affects your industry as a whole. Then, narrow them down to one that specifically will impact your business or your department at your organization.

In doing so, you are pre-solving an internal problem before it actually disrupts you simply by identifying that it is a potential problem!



But remember, every business or organization does not exist in a vacuum; you have customers whose wants and needs evolve.

You may view digital disruptions as a threat or a problem that could disrupt your status quo; however, there is likely a bigger problem your customers are currently facing that can be solved with this technology, which is where actual disruption occurs.

Don't waste energy worrying about how digital disruptions cause you problems; focus on how those digital disruptions generate solutions to problems your customers don't realize they have yet!

**Leverage** — Finally, it's time for you to leverage that digital disruption to your advantage. A major reason not to fear digital disruptions is because they are not sentient beings; they cannot and will not put themselves into action. Entrepreneurs and business leaders like yourself do the work!

Too many fear digital disruptions because they quite literally view them as being mutually exclusive from ourselves, almost as if Airbnb and Kayak somehow emerged out of thin air.

An entrepreneur saw a problem that customers of hotel chains and travel agencies were having and found an exponential way to use transformative technology to solve those problems.

### The Human Side to Digital Technology

You are in the driver's seat of the vehicle that is digital disruption and change! Whether you put said vehicle into drive and hit the gas is up to you, but that doesn't change the fact that each and every one of us has the opportunity to do so.

Change is the only constant; however, one constant that will never change is the need for the human touch. Much like disruptive digital technology only

causing disruption when a human discovers an exponential way to use it, a human has to be the one to leverage disruption; it will never leverage itself.

There is no reason to fear change, but there are endless reasons to get ahead of change and stay ahead of it. By implementing the principles of my Anticipatory Leader System, you learn to take charge of your destiny in your industry by way of identifying Hard Trend future certainties that will happen, eliminating unexpected disruptions by evolving with them and using them to your advantage in exponential ways to benefit your customers and humankind.

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