

June 2019  
VOL. XXXV, NO. 6

Daniel Burrus'

Celebrating 30+ Years of Publication

# TECHNOTRENDS<sup>®</sup> NEWSLETTER

*The biggest ideas that are  
changing everything*

## IN THIS ISSUE

Auto Insurance Industry:  
Disrupted or Disruptor?

Power Plant Surveillance

Robotic Farming

Electric Car for Under \$10,000

Re-Recyclable Plastics

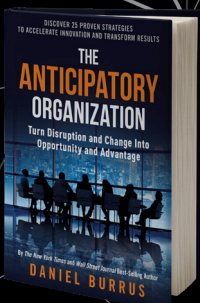
Storing Carbon in Rock

Endoscope in a Pill

Personal AI Avatars

Diagnosing Alzheimer's Using AI

## MY NEW BOOK



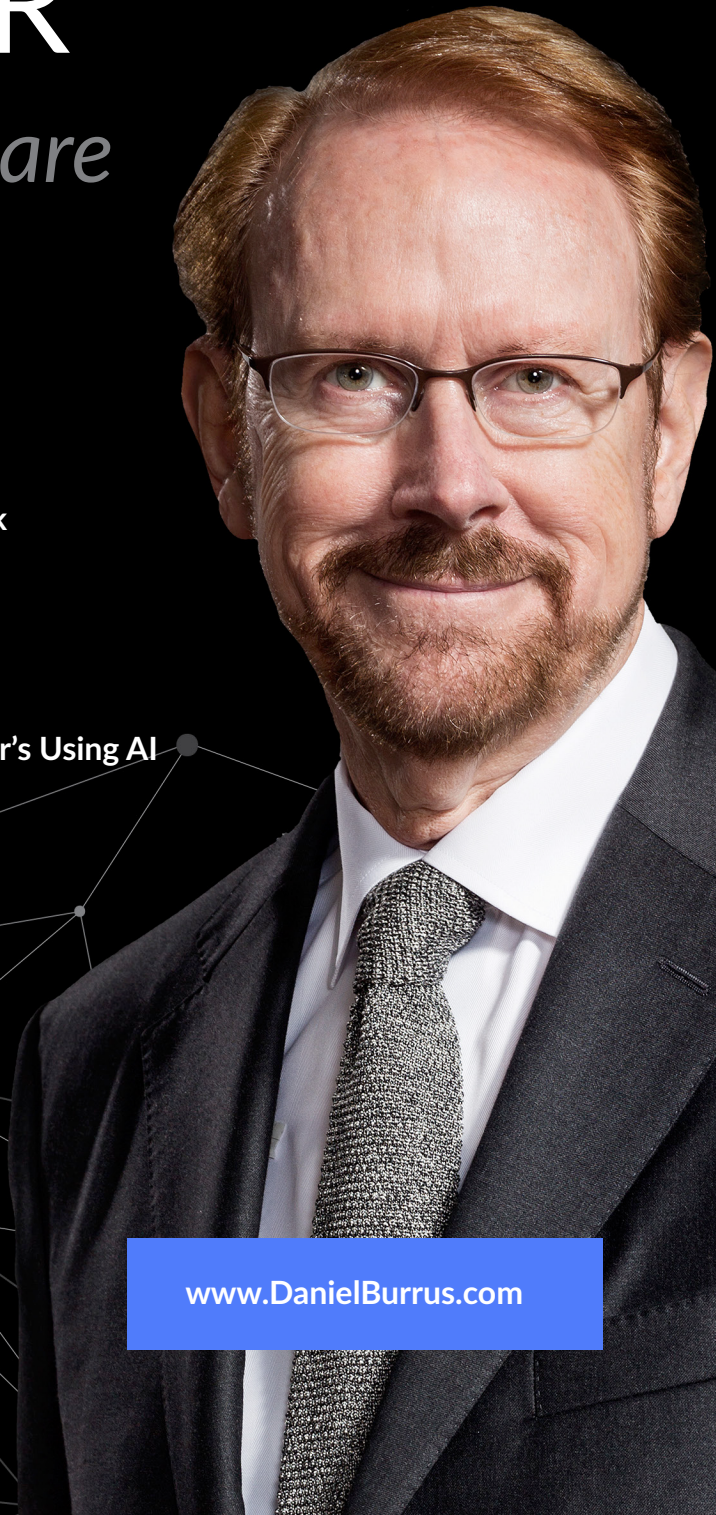
Agility Levels the Playing Field.  
Anticipation Changes the Game.

Learn more with my new book,  
*The Anticipatory Organization*

*"I'll pay for the book, you cover the shipping."*

[www.TheAOBook.com](http://www.TheAOBook.com)

[www.DanielBurrus.com](http://www.DanielBurrus.com)





# Auto Insurance Industry: Disrupted or Disruptor?

*By Daniel Burrus, CEO of Burrus Research*

Fifty years ago, television shows and cartoons showed us a future where people would be using flying cars, hovercrafts, or maybe even teleportation as a common way to get around. As the years ticked by, we saw small features, both aesthetic and functional, change and improve within the automobile industry, but nothing big until recently. Now we have fully electric vehicles with AI-enabled, self-driving, semi-autonomous features, as well as fully autonomous vehicle applications and experiments going on globally.

The thing few questioned along the way? What would these massive leaps and bounds in the automobile industry do to your insurance premiums? And likewise, would this deter a customer from buying a specific “vehicle of the future”?

*Multiple vehicles now on the roads have semi-autonomous or, in some cases, close to fully autonomous features*

At the present, you still hop in the front seat, with most of us turning a key or pressing a button, and you put your vehicle into drive with a lever or a knob. Because of this, most of the vehicles you drive leave your insurance unaffected; therefore, you are not persuaded to avoid a certain vehicle due to insurance premium rises. That is, until now, as we have taken massive leaps in the marriage of automobiles, wireless networking, and computer systems.

Multiple vehicles now on the roads have semi-autonomous or, in some cases, close to fully autonomous features, aimed at making the roads safer and saving drivers from themselves. Most notably, disruptive innovator Elon Musk and his creation of electric automaker Tesla has been in the limelight, both for good and bad reasons in regard to their vehicles implementing autonomous driving modes.

The good is that, for example, a sophisticated system of sensors, radars, and cameras is more adept at detecting trouble than human beings, and computers do not drive while intoxicated or accidentally doze off while driving on the freeway. I own a Tesla Model X, and when it is in self-driving mode, for the most part, it drives better than I do.

The bad? Tesla has run into plenty of hiccups in its initial version of autonomous driving mode being more limited than once conceptualized. Couple that with the fact that there are far fewer Tesla Model X automobiles on highways across the nation than Fords or Chevys, and many buying a Tesla will quickly notice their insurance premiums go up, depending on the insurance company they choose to use.

A recent example can be seen in the case of entrepreneur Dan Peate, who founded a company called Hixme, a provider of group health insurance. Dan, being part of the

*continued on page 8*

## TECHNOLOGY NEWS HIGHLIGHTS

# Power Plant Surveillance

With backing from Google, a group of nonprofit organizations has launched an initiative to use satellite data and artificial intelligence (AI) to monitor greenhouse gas emissions from every power plant on the planet. The system will utilize infrared sensors and other observation methods to monitor pollution in real time. Initially, the AI algorithms will provide information on overall pollution levels; however, over time, it's expected that the components could be further analyzed into separate parts including carbon, methane, and particulates. Most importantly, the information will be accessible to the public.

Power plant emissions are a major driver of climate change, and transparent, third-party verification is key to filling in gaps in the monitoring and reporting process. But

existing power plants will also benefit from more precise data for financial analysis of current operations. In addition, a system such as this can provide guidance to renewable energy developers as to where their future investments can have the greatest impact.

Making the data publicly available will empower citizens to put pressure on the worst offenders (as well as political leaders) to better enforce efficiency standards. It also has the potential to broaden public understanding of the scale of climate change and provide new insights on how to combat it.

For information: WattTime; phone: 510-201-9877; Web site: <https://www.watttime.org/>

## THE ANTICIPATORY LEADER PACKAGE \$39.95

- (1) Signed copy of The Anticipatory Organization
- (1) The Anticipatory Organization Mem Card Pack
- (1) Print copy of The Know What's Next Magazine Vol. 9

LEARN MORE





## Robotic Farming

While larger tractor manufacturers continue their long-term plans toward totally autonomous farming equipment, developers of smaller, specialized robots are already “making hay” on farms around the world.

For example, in Australia, farmers are beginning to reap the benefits of replacing 120-foot-wide, 16-ton spraying machines with smaller, truck-sized robots to control weeds. Instead of bathing a field in chemicals, the robots are capable of directing the weed killer more precisely at the weeds. One farmer saved 80 percent on chemical costs, improved crop yields, and was able to reduce the environmental impact of farm runoff in the process.

In Canada, another manufacturer has created an autonomous power platform that can be paired with a variety of implements (including a seeder, sprayer, land roller, and grain cart). The system is guided by preloaded field maps and GPS sensors to cover the same amount of land as a traditional combine. The use of a single power platform for multiple tasks reduces maintenance as well as labor costs.

There is little doubt that robots are going to transform the way we grow food through greater efficiency and lower costs. Smaller equipment may also prove to be better for

the soil itself by alleviating compaction, a factor that could also increase yields by an estimated 7 percent in some cases.

For information: SwarmFarm; Web site: <http://www.swarmfarm.com/>  
DOT Technology Corp.; Web site: <https://seedotrun.com/>



## Electric Car for Under \$10,000

A leading supplier of electric scooter commuter systems recently unveiled a two-passenger car that will expand the utility of their ride-share networks. Bolt Nano is an all-electric, four-wheeled vehicle designed for use in metropolitan areas when e-scooters may not be practical (e.g., longer commutes, traveling during bad weather, with a companion or with extra baggage).

Small enough to drive through a regular doorway, Nano can maneuver through traffic with ease. It also reduces parking congestion since four Nanos will fit into a single standard space. And the totally electric infrastructure reduces pollution while eliminating the burden of owning a car in the city.

Due to become available at the end of 2020, the basic Bolt Nano will sell for \$9,999, and pre-reservations are being accepted on the company's Web site for a refundable deposit of \$999. Owners will also be able to earn revenue by sharing their vehicle using the Bolt ride-share platform.

For information: Bolt Mobility, 820 Arthur Godfrey Road, Miami Beach, FL 33140; phone: 866-265-8143; Web site: <https://www.micromobility.com/>



# Re-Recyclable Plastics

Finding ways to reduce plastic waste is a key imperative for environmental scientists. Even with increased compliance in recycling initiatives, only 20 to 30 percent of plastic is currently recycled, and the vast majority of that cannot be recycled more than once.

All plastics are made up of large molecules called polymers, which are, in turn, made up of shorter compounds called monomers. Depending on the desired characteristics of the end product (e.g., toughness, flexibility, hardness, clarity), different chemicals are added, and the bonds that link those chemicals to the monomers remain intact even after processing at a recycling plant. The problem is that when the plastics are then combined, it's unknown what properties will emerge from the mix.

But recently, a team of researchers developed a new plastic called PDK (poly-diketoenamine), which can be recycled over and over. Through a simple process of immersing the plastic in acid, not only can the polymers be broken down into monomers, but the bonds between additives and the monomers can also be reversed. The monomers can then be recycled into

polymers and eventually plastics with a whole new set of properties, and without inheriting properties from the original material.

As an alternative to many of the nonrecyclable plastics in use today, PDK could help divert much of the waste from landfills and oceans.

For information: Brett Helms, Berkeley Lab, Materials Science Division, 1 Cyclotron Road, Mailstop 67R6110, Berkeley, CA 94720; phone: 510-486-7729; email: [bahelms@lbl.gov](mailto:bhelms@lbl.gov); Web site: <https://www.lbl.gov/> or <https://newscenter.lbl.gov/2019/05/06/recycling-plastic-from-the-inside-out/>



# Storing Carbon in Rock

A pilot project is currently underway at a geothermal power plant in Iceland to capture carbon emissions and turn them into rock. The method could provide a stable means of storing carbon from greenhouse gases as part of a global effort to stem climate change.

Known as CarbFix, the process basically takes carbon dioxide (CO<sub>2</sub>) that has been dissolved in water and injects it under high pressure into basalt rock up to 1,000 meters below the surface. The basalt, which is formed from cooled lava, contains small cavities that fill with water. As the gas comes into contact with minerals in the rock (mainly calcium, magnesium, and

iron), a chemical reaction occurs causing the CO<sub>2</sub> to mineralize. Once it's turned to rock, the only thing likely to release it is a volcanic eruption.

Although the method essentially mimics what is happening in nature, CarbFix speeds up the process dramatically. One drawback, however, is that it requires large amounts of desalinated water – around 25 tons for each ton of CO<sub>2</sub>. While this is not an issue at the Iceland installation, researchers are already looking at ways to adapt the process for saltwater so that it may be used in areas where fresh water is not as abundant. Work is also underway to develop a means of capturing the CO<sub>2</sub> directly from the atmosphere.

*For information: CarbFix; Web site: <https://www.carbfix.com/>  
Reykjavik Energy, Baejarhals 1, 110 Reykjavik, Iceland; Web site: <https://www.or.is/>*

## Endoscope in a Pill

Historically, diagnosis of digestive diseases has required the use of an endoscope – a flexible tube fitted with a light and a camera that allows physicians to examine internal organs. Although it's technically a nonsurgical technique, it does require anesthetizing the patient, making it expensive and impractical for use in remote areas of the world where digestive diseases are most prevalent.

This led a pathologist/engineer to develop a pill-sized device that can carry out an internal exam in an office setting. It's tethered to a console that enables the clinician to control its position. Using technology known as micro-optical coherence tomography (OCT), the device can inspect the properties of living tissue at a microscopic level. With the addition of high-resolution optical imaging technologies, it can capture surface images at the cellular level, making it possible to diagnose many diseases without the need for biopsies.

This technology has application in examining many other areas of the body, including the lungs, heart, kidneys, and pancreas. The swallowable capsule has been named one of the Top 10 Breakthrough Technologies of 2019 by MIT Technology Review.

*For information: Guillermo Tearney, The Tearney Lab, Massachusetts General Hospital, 55 Fruit Street BHX 600, Boston, MA 02114; phone: 617-643-2894; Web site: <https://www.tearneylab.org/>*

## Personal AI Avatars

Personal artificial intelligence (PAI) is rapidly changing the way people interact. The brainchild of two fathers who frequently traveled on the job, the first PAIs were developed to stay connected with their

families while they were on the road. Today, the company that they co-founded has expanded to offer a wide range of personal avatars.

The technology combines 3-dimensional imaging, natural language processing, and machine learning to build a customized hologram that looks, sounds, and acts like the user. And the more the user interacts with it, the “smarter” it becomes.

Initially the company targeted the entertainment industry as the most likely adopters of this new paradigm, but they envision that the idea will spread quickly. Healthcare PAIs could interact with patients by reminding them to take their medications or demonstrating physical therapy exercises. Teacher PAIs might interact with students to offer personalized tutoring. And in retail stores, PAIs could pop up on an interactive screen to answer questions and promote products.

As always, however, data ownership, security, and privacy are issues that need to be addressed proactively to combat “deep fakes” and the potential spread of disinformation.

*For information: ObEN, 130 West Union Street, Pasadena, CA 91103; email: [contact@oben.com](mailto:contact@oben.com); Web site: <https://oben.me/>*

In another application of machine learning, researchers have been working on an algorithm to predict the likelihood of Alzheimer’s disease (AD) using positron emission tomography (PET) scans. PET measures the uptake of radioactive compounds by brain cells to detect subtle changes in metabolism. One parameter that is easily measured by this technique is glucose consumption – an early predictor of AD.

The algorithm was “trained” using images from a 12-year study of patients 55 years of age and older, some of whom were ultimately diagnosed with AD or milder forms of dementia and some with no memory declines. Over 2,000 PET scans from about 1,000 subjects were included. Approximately 90 percent of the scans were used to train the system. It was then tested on the other 10 percent, and results showed that it correctly predicted AD 81 percent of the time. It was then used to test an additional independent data set taken from 40 patients over a 10-year period. The algorithm correctly identified 100 percent of those patients who would be diagnosed with AD an average of six years later.

Further work will focus on catching the warning signs even earlier in the development of the disease, when therapies are most effective.

*For information: Jae Ho Sohn, M.D., University of California-San Francisco Medical Center, Department of Radiology, 550 Parnassus Avenue, San Francisco, CA 94143; email: [sohn87@gmail.com](mailto:sohn87@gmail.com); Web site: <https://www.ucsf.edu/> or <https://www.ucsf.edu/topics/alzheimers-and-dementia>*



# Diagnosing Alzheimer's Using AI

# Auto Insurance Industry: Disrupted or Disruptor?

*continued from page 1*

insurance industry, was deterred from getting himself a Tesla Model X after he discovered through his own insurance company that his premiums would accelerate to roughly \$10,000 a year. If he would have shopped around, he would have found a much lower price, but why should the price vary so much, especially if the concept of owning a semi-autonomous vehicle is that it is specifically manufactured to be safer on the roads? Shouldn't your insurance drop drastically if your smart car can avoid accidents better than a human driver? If you find yourself asking these same questions aloud, you are definitely identifying a Hard Trend; there will be many more semi-autonomous and autonomous vehicles on the road every year.

Dan Peate also identified this growing Hard Trend and became more anticipatory in his thinking, as he then moved to start a wave of disruption from within the ever-rigid insurance industry he is already part of. He started Avinew, a new insurance company that monitors drivers' use of autonomous features on cars made by companies including Tesla, Nissan, Ford, and Cadillac. Avinew determines insurance premium discounts based on how and when autonomous features are used.

Avinew has agreements with most manufacturers, allowing it to access driving data in real time, once a customer gives them permission, and then utilizes the data gathered to cut insurance premiums, rather than the antiquated counterpart where data is gathered after accidents have occurred.

Underwriters and actuaries base insurance prices on the type of risk, and oftentimes they charge more due to not having enough data. The prevalent risk is actually the unknown, not the assumption that a semi-autonomous or autonomous vehicle will put you in danger. With real-time data coming in from participating owners of crash-avoiding vehicles, coupled with the data on how much safer these features make driving, the wave of change is in motion, disrupting the multibillion-dollar auto insurance industry.

With the interconnectivity of the world today, policyholders will increasingly have a more dynamic and interactive relationship with insurers, and much like decentralized currency, having more accurate accounts of transactions, in this case how often you use a safety feature, will eliminate frivolous costs that deter many from buying certain types of future-ready vehicles.

Some in the insurance industry may call this an existential crisis, but it is actually a chance for entrepreneurs to turn disruption and change into opportunity and advantage by learning to be anticipatory, just as Dan Peate and Avinew have. But the question of "If the driver isn't driving, why do we need auto insurance?" burns insurers' ears.

Research conducted at the Stevens Institute of Technology in New Jersey indicates that premiums could drop 12.5 percent by 2035 with this new wave of auto disruption, and that as it stands in the present, product lines centered on autonomous features will offset some of the loss, but the gains will remain far behind.

Forecasts like this might make the insurance industry feel like it has plenty of time. After

all, that same research above estimates that by 2035, there will still only be 23 million autonomous vehicles on American roads, which is less than 10 percent of today's total.

The problem with this, and many other research reports trying to forecast the future of autonomous driving, is that they fail to use one of the key principles I have been teaching for many decades, a principle that has helped me to maintain a high level of forecasting accuracy over the past 35 years. The principle is Both/And. Researchers, many in the auto industry, as well as the press, fall into the trap of thinking future vehicles will either be fully autonomous or not autonomous at all (Either/Or thinking).

The future fact is that fully autonomous vehicles in general use on our streets and highways will have much higher risk due to potential hacking and technology failure issues than semi-autonomous vehicles where crash-avoidance systems are fully in place yet the driver can take over if they need to. What we will see is very rapid growth in semi-autonomous cars, as well as older cars being fitted with semi-autonomous crash-avoidance systems, and a rapid growth of fully autonomous vehicles in areas where their use can be maximized with less risk. That means that the numbers of vehicles with semi-autonomous and fully autonomous capabilities will grow far faster than most are projecting. Keep in mind that over 80 percent of people in emergency rooms are there from a traffic accident. A key driver that will accelerate this Hard Trend is the need to dramatically reduce accidents!

The insurance industry will have to move on this far faster than projected or be disrupted by anticipatory outsiders who can see the future faster than their slower counterparts. Insurance

will be needed, which is very good news for the insurance industry, but the risk is shifting and following the risk to find the opportunity will be a key to growth in the years ahead. Hint: The risk is increasingly shifting to the vehicle manufacturer, the software provider, the seller, and the tech component system providers.

What is obvious is that the driver will increasingly become less of a risk, and the vehicle and systems will become more of the risk in all forms of transportation. One way an entrepreneur could look at this and anticipate what is to come is by paying less attention to what Dan Peate and Avinew are currently doing, and focus their energy on what will disrupt Dan Peate and Avinew in the coming years.

Risk will migrate. If the risk is less human involvement and more system centric, said risk becomes systematic and far more predictable and preventable in nature.

Blame has the potential to become quite convoluted, but they are all individual opportunities for existing insurance companies to anticipate, adapt, and grow, or stagnate and fail. The good news is that by using the Hard Trend Methodology, you have a choice.



**Anticipate Disruptions and Problems To Find New Opportunities with The Anticipatory Organization.**

**THE ANTICIPATORY ORGANIZATION**  
Turn Disruption and Change into Opportunity and Advantage  
DANIEL BURRUS

**ORDER NOW**

# Burrus Research®

*Technotrends is published 12 times a year by Burrus Research, Inc., a research and consulting firm that monitors global advancements in science and technology and their direct impact on business and consumers. Mary Norby, Editor, 1860 Executive Drive, Suite E2, Oconomowoc, WI 53066. To subscribe, call 262-367-0949 or email [office@burrus.com](mailto:office@burrus.com).*

©2019 Burrus Research, Inc.