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NEWSLETTER

The biggest ideas that are changing everything

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A Massive Uptick In Ransomware Attacks

By Daniel Burrus, CEO of Burrus Research

COVID-19 was certainly not the only virus to sweep both the nation and the world in the past year. Virtual viruses descended on a few major industries, generating a level of panic that created shortages of gas and beef while spreading misinformation like wildfire.

In a world where digital exponential change is accelerating at a rate never before seen, a speed that increased multiple times over by the global pandemic of 2020, cyber threats are no longer a frustrating obstacle that an individual faces, where they merely need to change their bank account information and move on. The Internet of All Things means that, while the ease of large-scale connectivity is appealing, our vital systems in place are more delicate than we realize.

Through my Anticipatory Leader System, I teach competencies that train C-suite executives and business leaders in several different industries how to implement my Hard Trend Methodology to leverage disruption and change to their advantage. This methodology teaches them to pay attention to Hard Trends - or future certainties that will happen -- and pre-solve any problems that they know are coming based on those future certainties.

I also encourage every individual who utilizes my Anticipatory Leader System to think exponentially. Cybersecurity and using anticipation to thwart cyberattacks are the perfect examples of exponential thinking. While most utilize my Anticipatory mindset to leverage disruption and become positive disruptors, it can also be used

to see disruption and plan ahead before it ever disrupts, which is largely the case in preventing hacking and other cybercrimes committed against your business or entire industry.

> *We have heard about these viruses for decades now, but how about ransomware?*

Record Year For Ransomware
Since the early nineties, our usage of the personal computer has evolved, and right alongside them, computer viruses and cyber threats have evolved as well. During the earlier years of the internet and email, worms, Trojan horses, and other types of malware basically found their way into your computer system and replicated themselves, replacing code within fully functional programs with the duplicate of itself. In many instances, the only way to correct the problem was to completely wipe your hard drive.

We have heard about these viruses for decades now, but how about ransomware? This became the cybercrime buzzword of the earlier part of 2021, after making headlines when a group of Russian hackers named DarkSide brought the Colonial Pipeline to its knees. This created a wave of panic-buying, causing gas shortages in nearly all southeastern states.

While the pipeline struggled to fix the problem,

TECHNOLOGY NEWS HIGHLIGHTS

Fusion Magnets

Fusion technology has long been regarded as the best path to limitless, clean energy. Much of the research todate has been confined to tabletop scale models, but new developments in magnet design could propel the industry forward.

In a nutshell, a fusion reactor works by heating hydrogen under extremely high pressures to hundreds of millions of degrees, forming plasma – a superheated state in which electrons are stripped away from the atoms, allowing them to fuse together and form helium.

In the fusion process, some of the mass is transformed into heat, which can be used to generate electricity. Powerful magnets are needed to contain the plasma, and they need to be designed so that they don't consume more power than the reactor can produce.

The new magnet design utilizes 300 kilometers (185 miles) of a special electromagnetic tape comprised of thin layers of super-conducting rare earth barium copper oxide (ReBCO). The tape is wrapped around a 10-ton, D-shaped magnet and supercooled to -253 degrees Celsius (-423 degrees Fahrenheit), at which point it can conduct up to 40,000 amps of electricity – enough to power a small town.

Eighteen of the magnets will be placed in a spherical tokamak. At full power, it's estimated that the forces generated by the magnets will be twice that of the pressure at the bottom of the deepest ocean trench.

The first demonstration device – known as SPARC – will be constructed in collaboration with the Massachusetts Institute for Technology (MIT).

For information: Commonwealth Fusion Systems 148 Sidney Street, Cambridge, MA 02139;email: info@cfs.energy; Web site: https://cfs.energy/

Inflatable Sails

Recharge While You Drive

One of Michelin's latest sustainability projects has nothing to do with tires. The Wing Sail Mobility (WISAMO) Project is geared toward decarbonizing shipping tankers using wind power.

WISAMO is an inflatable, telescopic sail that can be installed on merchant vessels as well as pleasure boats. It can be retrofitted to existing ships or integrated into the designs of new builds.

Designed in collaboration with world-renowned sailing experts, it is particularly effective on windward points of sail, and can improve fuel efficiency by as much as 20 percent while also reducing carbon emissions. The retractable mast also enables ships to enter harbors and pass under bridges safely.

The first WISAMO system will be installed on a merchant ship next year, and production will follow upon completion of a trial phase to test its performance under actual shipping conditions.

For information: Michelin; Web site: https://www.michelin.com/ en/ or https://www.michelin.com/en/press-releases/2021-mov- inon-michelin-presents-two-innovations-to-accelerate-the-de- velopment-of-sustainable-mobility/

A new solar-electric vehicle that recharges itself whenever it's out in the sun is slated to enter production next year. Dubbed Sion, the minivan-style auto is covered with 248 polymer solar panels that can generate up to 35 kilometers (more than 20 miles) of additional range per day (depending on weather).

Like any electric car, Sion can be recharged by plugging into a power outlet or charging station; however, a bidirectional onboard charging system also enables power-sharing with other vehicles. The average driving range on a full charge is about 255 kilometers (160 miles), but with the added solar boost, it has been estimated that, under normal use, the vehicle could run for up to four weeks before losing power.

Sion has been designed with cost-efficiency in mind by using off-the-shelf parts and limiting production to one model and color (i.e., black). Many standard replacement parts can be changed by the owner, making maintenance more affordable, too. The company plans to sell exclusively online with a target starting price of $26,400.

For information: Sono Motors GmbH, Waldmeisterstrasse 76, DE-80935, Munich, Germany; phone:+49-089-4520-5818; email: info@sonomotors.com; Web site: https://sonomotors. com/

Restoring Sight to the Blind

Doctors recently reported success at restoring partial vision in a patient who had been blind for nearly forty years. Part of a Phase I safety trial that began in 2018, this case represents the first published study of using optogenetics to partially restore vision in humans.

The participant had lost his sight to retinitis pigmentosa (RP), a genetic disorder in which the light-sensitive cells in the retina break down. Researchers engineered genes that would stimulate the retina to produce light-sensing proteins commonly found in algae and injected them into one eye. The subject was then fitted with special goggles that capture images of the surroundings and translate them pixel by pixel into a monochromatic video signal that can be projected onto the retina.

The participant was unable to visually detect objects before injection, or even after injection, without the use of the goggles. However, after treatment, and with the use of the goggles, he was able to perceive, locate, count and touch a variety of objects. Electroencephalographic (EEG) recordings also indicated evidence of visual changes in the occipital cortex – the visual processing center of the brain. All of this points to the use of optogenetics as a promising therapy for restoring vision in individuals with advanced RP.

From Fossil Fuels to Renewables

As more and more businesses look to limit their carbon footprints with renewable power, oil and gas (O&G) companies are hoping to get into the game by expanding their businesses through diversification.

The trend seems to be led by European-based companies. For example, BP (British Petroleum) has plans to develop 320 Gigawatts of renewable capacity by 2025. French-based Total has set a target of 35 Gigawatts in the same time frame. These (and other) O&G giants are looking at a broad range of technologies from solar and wind power to battery storage, geothermal, hydrogen and carbon capture systems (CCS).

So what are they planning to do with all of this capacity? It appears that O&G is hoping to replace at least some of the capacity of traditional regional utilities by supplying electricity to large corporate users like Amazon and Microsoft. It's hard to say where it will all end up, but like most things, it probably won't be an "either/or" proposition. In a

"both/and" world, there will be room for corporate giants as well as local producers. The key will be remaining agile enough to respond to customer demands.

For information: BP PLC; Web site: https://www.bp.com/
Total Energies; Web site: https://www.totalenergies.com/

broadband signals to beta users; however, SpaceX has been authorized to deploy approximately 12,000 satellites in total, at a range of altitudes and frequency bands. Although the system does not yet have complete global coverage, launches scheduled for later this year will be aimed at achieving that goal by placing satellites into polar orbit.

For information: SpaceX; Web site: https://www.spacex.com/

Toward Global Connectivity

SpaceX recently deployed 60 additional satellites, bringing the total number of spacecraft in their Starlink constellation to nearly 1,500.

The company was also granted permission by the Federal Communications Commission (FCC) to lower the operating altitude for more than 2,800 satellites from a range of 1100-1300 kilometers (684-808 miles) to a range of 540-570 kilometers (335-354 miles).

The lower orbit will improve the speed of Internet access by shortening the distance that data must travel between the satellites and base stations on earth. It will also allow the network to be deployed more quickly.

The goal of the Starlink initiative is to bring reliable broadband access to remote areas across the globe. The network is already sending low-latency

AI-Generated Faces

As if it weren't difficult enough to discern what's real and what's fake when it comes to faces on the Internet, a new tool is now available that creates faces from thin air. But it's not as bad as it sounds.

Unlike deepfakes that place someone's face on another person's body, or make people say and do things they never said or did, Generated Photos doesn't let you copy another person's image.

Instead, it generates photos from scratch and allows users to modify the images to suit their needs. Modifiers include sex, skin, hair and eye color, age, head pose and facial expression.

When you're finished with the image, you can purchase it in high-resolution format for your

personal or commercial use (just like stock photography).

The tool is designed for a broad range of users who want more control over images than regular photography can offer. For example, researchers wishing to study biases based on a particular trait can simply invent sample subjects from a common image.

The next version may enable faces to be placed on full bodies to broaden the market even more.
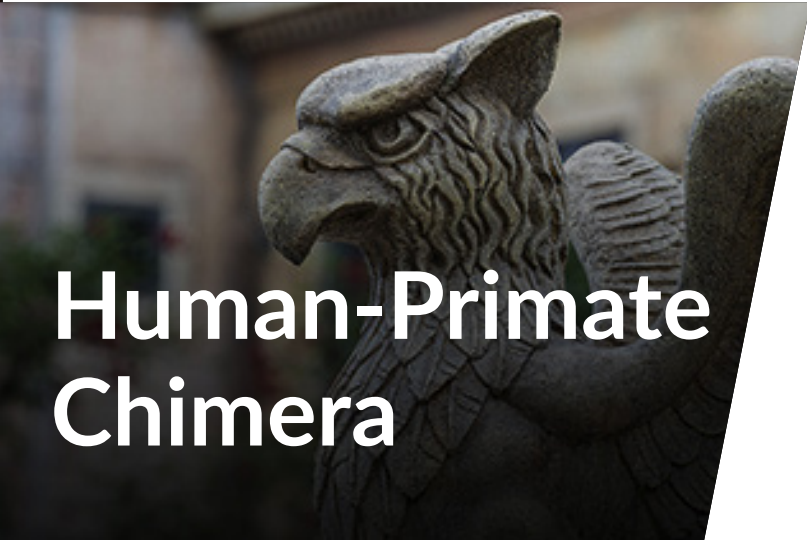
For information: Generated Photos; Web site: https://generat-ed.photos/

Human-Primate Chimera

When most people hear the term "chimera," they think of the mythological fire-breathing creature – part lion, part goat and a little bit snake. But in genetics, the term actually applies to any organism with cells from more than one genotype.

In fact, in recent decades, experiments have created mouse-rats, sheep-goats and chicken-quails. Now, scientists in China have reported creating human-monkey embryos.

Dozens of macaque embryos were injected with

human pluripotent stem cells, which are capable of developing into any type of cell in the body.

The human cells were tagged with fluorescent markers to track where they ended up as the embryos developed. Although human cells were present in all four types of tissue present in mammalian embryos, they made up no more than 7 percent of any given type of cell. None of the embryos survived more than 20 days.

Research such as this, while banned in the United States, could shed some light on embryonic growth and its role in congenital diseases.

Chimeric animals could also someday be used to provide organs for transplant. Still, the moral and ethical implications of creating human-animal hybrids bears a great deal of serious consideration.

For information: Tao Tan, Kunming University of Science and Technology, Room 1405 Administration Building, No. 727 South Jingming Road, Chenggong District, Kunming, 650600, China; phone: +86-871-6591-5166; fax: +86-871-6591-5789; email: international@kust.edu.cn; Web site: http://english.kmust.edu.cn/

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those panicking likely glossed over what exactly the ransomware was doing to shut down an entire pipeline. In short, ransomware essentially encrypts, or locks, vital information at an organization or within software that a company operates on. Thereafter, hackers demand a ransom payment to unencrypt the files and let business carry on as usual. Unfortunately for the Colonial Pipeline, they paid the ransom to be able to get their system up and running, remedying the gas shortage, but doing damage to the price.

A Ransomware Attack Every Hour
The Colonial Pipeline hack was known nationwide, and brought to light the importance of cyber-security; however, just as uninformed about ransomware as the public appeared, they also were unaware of the colossal number of ransomware attacks happening over the year prior. There were roughly 65,000 ransomware attacks that didn't make headlines throughout the already tumultuous year of 2020. That amounts to an attack every hour!

These ransomware attacks were not solely on personal computers and individual bank accounts; these were on companies with employees relying on them for their livelihoods, small businesses already struggling through the coronavirus pandemic, vulnerable individuals who likely did not understand what had happened, and so many more.

When a larger company has a breach in its cybersecurity measures, too often, it is a result of a highly neglected IT system. During the shift to a remote workforce because of COVID-19, companies were in no way prepared with a plan to enforce new cybersecurity measures as employees were using their own modems and connectivity to access remote servers, opening them up wide for breaches in cybersecurity.

Pandemic unpreparedness aside, in general, a cyberattack at any business or organization should not be taken lightly. In some industries such as healthcare, where personal data is hacked constantly, organizations actually get fined in the neighborhood of $28 million annually for breaches in security! Imagine the ripple effect that has from management, to lower-level employees.

Anticipation Improves Cybersecurity
A Hard Trend to all of this discussion about ransomware and cybercrime is that it is only going to get worse. So long as technology gets more advanced, cybercriminals will get more savvy in their missions to steal data, money, and more via the ever-increasing connectivity of the world. Even worse, cybercrime occurs around the clock, all year long. How can you possibly defend against a criminal that is nearly fully autonomous and artificially intelligent?

The truth is: You can't. As I stress in my Anticipatory Leader System, being reactionary and agile is only half the battle. When you only operate with agility, you are constantly leading from behind, and when you think of the 2020 statistic of a ransomware attack happening quite literally every hour, the odds will eventually be stacked against you. Imagine trying to put out a fire while another three are started behind your back; there is no way that that system will stop future fires from ever happening.

The more proactive way to increase your cybersecurity, both individually and on an organizational level, is with a shift in your mindset to one of anticipation. Instead of trying to extinguish the fires a cybercriminal starts, while they start more behind your back, discover a way to take away the matches from them, or have a large fire extinguisher waiting in the trenches that

outmatches their plan to burn down your woods!

When using an anticipatory mindset, you can see issues in your cybersecurity before they become issues. For example, if cybercriminals ping business systems over a thousand times a day, voraciously hunting for a way in, you may need an external IT company to keep your software uptodate at all hours of the night.

This method is an example of what I refer to in my Anticipatory Leader System as the Skip It Principle. Many smaller businesses cannot afford an IT department to work around the clock, so, instead of focusing on what they can't do, they simply skip that problem and hire an external security firm to update their software and monitor their operating systems during all shifts of the day. This is ultimately a more affordable option, and it stops those small businesses from disregarding cybersecurity measures altogether for the sake of cost savings.

Thoroughly Train Your Staff To Be Anticipatory
Outside of your network administrators and IT professionals, the best way to improve cybersecurity at your business or organization is to teach your entire staff how to implement an Anticipatory mindset toward technology. Having a unified understanding of best practices when using digital technology trains your staff of all career levels to be on the lookout for suspicious activity. In a way, a team of Anticipatory thinkers toward cybersecurity is like having a company-wide IT department in itself!

My Anticipatory Leader System is designed specifically to accomplish this, teaching your staff everything from understanding disruptive Hard Trends, and how to discern between a Hard Trend and a Soft Trend, to real-world interactive challenges, to engage your staff as they master these revolutionary principles and become experts

in staying ahead of dangerous disruptions.

In working with many IT organizations globally each year, I have identified a best-in-class cyber testing company that will provide a perimeter test of your systems, along with the results, and recommend immediate actions that can be taken to stop any uncovered leaks. If you would like a free perimeter test to check for vulnerabilities in your cybersecurity defense system, please contact us.

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