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The biggest ideas that are changing everything

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Privacy in the Expansive Digital Universe

By Daniel Burrus, CEO of Burrus Research

The world is connected on so many digital levels. Quite frankly, it is impossible for a single person to comprehend just how many virtual locations their personal data resides, and likewise, how secure it actually is.

From social media housing general data about us, such as our birth date and where we live, to more unique details, such as our music preferences on Spotify or favorite movies saved on Netflix, we quite literally wear our lives on sleeves made of algorithms stored on remote servers.

But as the Three Digital Accelerators, which include computing power/processing power, bandwidth, and storage, continue to drive exponential digital transformation, we will grow increasingly dependent on those digital advancements simultaneously.

Is this a bad thing? Of course not! Digital transformation is meant to improve our lives, not riddle us with fear. However, there is certainly a dark side to the connectivity that provides us with such boundless access to information, services, entertainment, and more: It is a breach of privacy.

> *In the realm of social media, it is no longer a secret that you are the product.*

Consumers: Is It Really Your Data?

Before discussing not only personal data and privacy discrepancies that have happened en masse, but the Anticipatory steps both individuals and companies can take to transform how these issues affect them, we have to explore the concepts of personal data in general. Namely, is it really yours?

I have explored this topic in past blogs and articles, but digital transformation has since increased twofold in lieu of the coronavirus pandemic of 2020.

In the realm of social media, it is no longer a secret that you are the product. While you spend time scrolling through Facebook, Instagram, or even posting your next viral video on TikTok or YouTube, you are subjected to relentless advertising and targeted marketing based on your personal data.

That right there is enough to worry individuals who did not grow up during the social media boom and leave those who did in the dark as to whether or not they can trust a company not to sell their personal information.

But the second you sign up for social media, buy something on Amazon, or subscribe to an entertainment streaming service, you agree to the terms of service of said company, often buried deep in a string of legalities that protects them from lawsuits.

So, in selecting "OK," is it still your data? In many cases, your data does not belong to you because you are the product, as mentioned above.

Companies make money by using your data to place ads in front of your eyes and ears, which

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TECHNOLOGY NEWS HIGHLIGHTS

Nanotech Armor

A new nano-architected carbon material has been developed that is more effective at stopping projectiles than an equal mass of steel or Kevlar™. The breakthrough could lead to lighter and stronger personal armor, protective coatings, and blast shields.

The material consists of tiny carbon struts (thinner than a human hair) that are interconnected to form tetrakaidecahedrons.

These 14-faced structures (also known as Kelvin cells) have been used in shock-mitigating foams to absorb kinetic energy. But when made from carbon, the three-dimensional shape can transform a normally stiff and brittle substance into a bendable, flexible material.

It was tested by bombarding it with 14-micron silicone oxide particles traveling at supersonic speeds of up to 1,100 meters per second (2,461 miles per hour).

As a point of comparison, the speed of sound is 340 meters per second or 761 miles per hour. Pound for pound, the new material performed 100% better than steel and 70% better than Kevlar.

Next, the researchers will be looking at ways to scale up production as well as assess the performance of other substances besides carbon for impact-resistant properties.

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Bedside MRI

Magnetic resonance imaging (MRI) has become a vital diagnostic tool, but traditional systems offer limited access to this potentially lifesaving technology. Now, a small, portable system aims to revolutionize the way MRIs are acquired by bringing the imaging system to the patient.

Conventional MRI systems utilize extremely strong magnetic fields and radio waves to capture images inside the body. They consume large amounts of power and can only be used in dedicated, specially shielded rooms to prevent interference from external electromagnetic (EM) sources.

They are extremely costly to purchase (upward of $1 million for a low-field unit), install, and maintain; and because a scan can average anywhere from 15 to 90 minutes, patient throughput can be slow.

The new system – called Swoop™ – is not only mobile but also uses lower magnetic field strengths so it can be operated in high-metal-content environments (such as ICUs) safely.

Integrated noise cancellation technology automatically detects and corrects for EM interference, and initial scans are available in as little as 30 seconds. The system costs about $50,000.

The benefits of bringing MRI to the patient bedside include faster diagnosis and intervention during the critical first minutes of a medical event.

But Swoop also opens up access to MRI technology in smaller rural hospitals and clinics where the cost of a traditional system is prohibitive.

The system received emergency use authorization last year to identify COVID-related neurological abnormalities, and the company's deep learning algorithm for detecting stroke and traumatic brain injury was recently cleared for use.

For information: Hyperfine, 351A New Whitfield Street, Guilford, CT 06437; website: https://hyperfine.io/

Diesel-Eating Bacteria

While oil-eating microbes have been reported in warmer regions, the process was not well-documented in permanently cold environments. But according to a recent study, naturally occurring bacteria in the Canadian Arctic are also capable of biodegrading diesel fuel and crude oil.

Importantly, the researchers identified species of bacteria that were not previously known to

degrade oil. By simulating oil spills inside bottles using mud from the floor of the Labrador Sea, they were also able to confirm that adding nutrients, such as nitrogen and phosphorous, enhanced the process.

As industrial activity, shipping, and offshore oil and gas operations increase in Arctic areas, so do the risks of oil spills. But emergency response times to these remote areas could be slow.

Microbes may be nature's first responders and an integral part of a comprehensive approach to protecting the arctic waters on which many indigenous populations rely for food and business.

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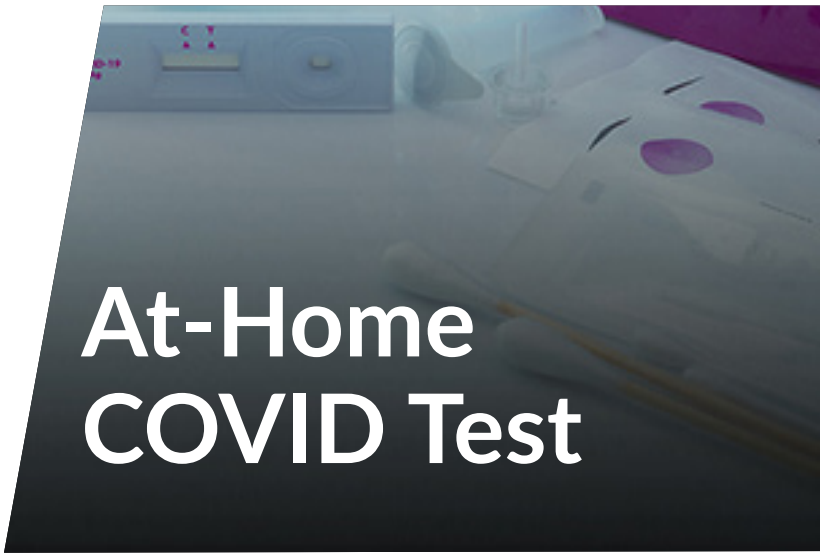
Opinion Mining

More and more businesses are not only interested in what their customers are buying but also how they feel about their purchases. While customer surveys can report what people say explicitly, a new method called sentiment analysis is designed to implicitly quantify customer attitudes based on what they say or write.

These techniques employ natural language processing (NLP) – a branch of artificial intelligence (AI) that uses computational linguistics to understand and process language. Simple forms include chatbots, voice assistants ("Hey, Alexa"), and negative-to-positive language scoring.

Today, these tools analyze many other aspects of speech, including the words used, length of time, speed, loudness, and variations in sentiment at different phases of a call. Although several tech companies have developed platforms for sentiment analysis, Amazon Web Services (AWS) recently packaged these tools in an application programming interface (API) for transcribing audio recordings. It offers the service for incorporation into enterprise dashboards for a per-minute fee based on volume.

For information: Amazon Web Services; website: https://aws.amazon.com/



At-Home COVID Test

Scientists have developed a new coronavirus test that could be performed by patients at home and provide results within an hour. It can also determine with which variant a user is infected. The device – known as miSHERLOCK –uses CRISPR-based technology to find viral RNA in

saliva samples. Although coronavirus testing typically uses nasal swabs, several studies have reportedly found that saliva tests achieved similar accuracy. In addition, the SARS-CoV-19 virus is detectable in saliva for a longer period after infection.

The battery-operated device, which can be produced on a 3D printer, contains two chambers. A heated preparation chamber preprocesses the saliva sample to disable enzymes (called salivary nucleases) that can destroy RNA. After three to six minutes, the saliva passes through a filter which the user then transfers to a reaction chamber. In less than an hour, a fluorescent signal will appear which can be analyzed with a smartphone app for a positive or negative diagnosis.

miSHERLOCK was tested on 27 infected patients and 21 healthy patients. It correctly identified positive patients 96% of the time and negative patients 95% of the time. It also effectively distinguished between alpha, beta, and gamma variants. At a cost of about $15, devices such as this could be extremely helpful in tracking the virus and its long-term effects.

For information: James Collins, Massachusetts Institute of Technology, E25-337, 45 Carleton Street, Cambridge, MA 02139; phone: 617-324-6607; fax: 617-253-7498; email: jimjc@mit.edu; Web site: https://www.mit.edu/ or https://dspace.mit.edu/handle/1721.1/131169

Predictive AI

A machine learning-based system is helping the military predict events up to days in advance using a combination of artificial intelligence (AI), sensors, and cloud computing.

The system integrates information from a global network of sources to identify trends and pinpoint possible threats. It's also tied into real-world assets to enable more effective collaboration, assessment, and logistics coordination.

In a series of tests known as Global Information Dominance Experiments (GIDE), the system was able to sift through mountains of data in a matter of seconds, as opposed to the hours or days that would have been required for human analysts to complete the task.

The ability to identify potential problems earlier could allow governments and other organizations to be more proactive in deterring conflicts and deploying defensive strategies.

For information: United States Department of Defense; website: https://www.defense.gov/ or https://www.af.mil/News/Article-Display/Article/2703548/norad-usnorthcom-lead-3rd-global-information-dominance-experiment/

Two-Legged Robot Runner

A bipedal robot recently became the first in the world to complete a 5K run. Dubbed Cassie, the two-legged device represents multiple breakthroughs in the science and understanding of locomotion.

Looking a little bit like the body and legs of an ostrich, Cassie taught itself to run using a deep reinforcement learning algorithm.

Basically, the robot had to learn how to balance dynamically on its own by making an infinite number of tiny adjustments while in motion. It completed the run in a little over 53 minutes autonomously on a single battery charge. It is also capable of going up and down stairs.

Robots like this will undoubtedly become more commonplace for tasks like package delivery and even assisting people in their homes.

For information: Jonathan Hurst, Oregon State University, School of Mechanical, Industrial and Manufacturing Engineering; phone: 541-737-7010; email: Jonathan.hurst@oregonstate.edu; website: https://oregonstate.edu/ or https://today.oregonstate.edu/news/bipedal-robot-developed-oregon-state-makes-history-learning-run-completing-5k

Digital Twins

Virtual copies of building and even cities are changing the way architects, designers, and planners collaborate.

Digital twins (as they're known) are more than just models of existing real-world objects. With the use of sensors, 3-D imaging, and real-time monitoring, they can be used to measure changes, evaluate proposed improvements, and assess the impact of unexpected events.

Information can be constantly updated to mirror what's happening in the physical world, or time can be accelerated to present a picture of the entire life cycle.

These complex and dynamic platforms could be used to predict the effects of climate change, improve building design, or optimize the efficiency of transportation networks. They are also being used in science and industry to develop products and evaluate their use.

For information: Dassault Systemes,10 rue Marcel Dassault, CS 40501, 78946 Velizy-Villacoubley Cedex, France; phone: +33-(0)1-6162-6162; website: https://www.3ds.com/

Privacy in the Expansive Digital Universe

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in many cases keeps their service free to you. You are essentially trusting a corporation with sensitive personal and financial information in exchange for the product they sell or service they provide.

Breaches and Privacy

If consumers were asked honestly if they feel trust should be earned, they would likely reply with a resounding 'yes.'

However, that simple act of checking the box that states they agree to the terms and services of something they sign up for or pay to receive has become a brainless reflex in our fast-paced world.

Just as many who feel a company should earn their trust simply scroll past all privacy policies, check the box, and move on without a hint of concern.

But while agreeing to a privacy policy has become a mere legal maneuver a company implements to protect it from lawsuits, it does nothing to actually protect consumer data from being stolen in the event of a breach.

Once a cybercriminal finds their way into the backend of a business's digital world and either releases personal customer information or uses it to commit fraudulent acts, a tangled web must be unwoven to resolve the breach and do right by the customers who have been affected.

This breach infects their trust in an organization, often leaving the relationship damaged beyond repair.

Privacy-as-a-Service

In lieu of the frequency at which data breaches are occurring, customers both old and new are starting to expect their privacy to be a company's utmost concern.

Also known as privacy-as-a-service, or PaaS for short, this has become a standard in many consumer demands. They want no part of a company that doesn't make a tremendous effort to protect their personal data.

The reason this 'privacy revolt' of sorts is taking place is not solely because of social media. There are plenty of individuals who resist social media in every generation, either for the reason of privacy or otherwise.

No, the main reason is because, thanks to exponential digital transformation, the instances where you need not enter at least some of your personal information to purchase a product or service are becoming few and far between.

Now, thanks to the coronavirus pandemic of 2020, even more traditionally physical exchanges for products and services have gone virtual. I even recently wrote a blog about how the Federal Reserve is exploring actual digital currency, where cash fast becomes obsolete and, additionally, perhaps a lot of our vital identity information is stored on the blockchain.

But outside of willingly having to put your information into apps and websites, even your mobile devices are veritable footprints for your behavior, search history, and where you traveled recently.

By all means, you sign agreements at service providers that are in the same category as privacy policies on apps and websites.

So, whether you are a company or a consumer, what can be done to navigate this new frontier of data and privacy?

Use Anticipation to Navigate Privacy Issues

Let's start with businesses and organizations: How do you ensure your PaaS offerings are fully integrated in everything to offer? The answer is in my Anticipatory Organization Model.

First, identify where your industry is going based on Hard Trends both inside and outside of the industry itself. What are the digital disruptions heading your way that will impact how you collect customer data and their personal information when they purchase a product or service from you?

Once that is established, what technological options are available to increase security and thwart cyberattacks, where that personal information can be leaked to the world?

What you're doing as an organization is pre-solving privacy problems before they occur using an Anticipatory mindset!

To peel back the problem onion in using the Skip It Principle from my Anticipatory Leader System, rather than developing elaborate legal loopholes to merely prevent being sued, you're skipping that problem and pre-solving the real problem: a customer's fear of personal information being leaked.

Once this plan is in place, celebrate it! Place it at the forefront of your products and services, and reassure all new and returning customers that you have their privacy concerns solved!

Once these changes are implemented, listen to your customers! There are plenty of instances where they ignore feedback surveys; however, the ones who participate are invaluable.

If you get the sense from customer feedback that their trust in your privacy security is waning, it's time to reassess things.

It also pays to ask how customers feel about their data being handled by your organization before you implement any of my Anticipatory principles so you can gauge their expectations directly.

As our world gets increasingly more digitally connected, staying ahead of the disruption curve is vital. Digital disruptions come in all shapes and sizes, but an Anticipatory mindset keeps you innovating and progressing through them all.

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