April 2019
VOL. XXXV, NO. 4

Daniel Burrus'

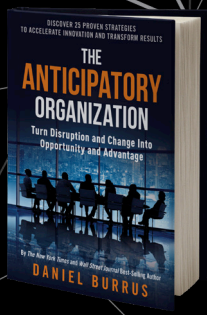
Celebrating 30+ Years of Publication

TECHNOTRENDS® NEWSLETTER

The biggest ideas that are changing everything

IN THIS ISSUE

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

www.DanielBurrus.com

Content Trends Move Fast Advertisers Must Learn to Anticipate

By Daniel Burrus, CEO of Burrus Research

If your job is to market to a specific demographic, how do you find the audience that you are looking for? Several years ago, a major media agency compared broadcast, cable, and internet for a retail ad campaign. The research team recommended that 75 percent of the budget should go to online—and it should be targeted.

Here are three classic examples:

• **Behavioral Targeting:** Cadbury-Schweppes bought audiences for their sports drink, Accelerade, that were 100 percent composed of people who searched exercise-related topics and/or visited fitness groups.

• **Engagement Targeting:** Pepsi created custom audiences who engaged with its online advertisements.

• **Audience Pyramid Segmentation:** Yahoo! organized its audiences with 500 million users at the bottom, representing mass marketing; 80 million users in the middle with the intent to purchase; and another 6 million passionate customers at the top of the pyramid.

Marketers can still target any of these groups with relevant ads and expect to reach the appropriate audience. However, thanks to the speed of new technology, today's landscape is much more complex.

Case Study:
Targeting Young Consumers

Do you remember when MTV was the best way to get in front of the teen and young adult audience? It was great while it lasted. But once mobile technology became popular, it didn't take long for that age group to be on the move.

In no time, videos were streaming on iTunes. Though teens continued to watch MTV for videos and expanded programming, like Real World, viewership dropped. Those who did watch content on TV started using digital video recordings (DVRs) to skim through commercials.

> *In 2018, Facebook stood to lose an estimated 2 million users under the age of 24*

Next for this age group came instant messaging, a gateway to social media. And, for a time, Facebook once again gave advertisers their niche audience of young consumers congregated in one place.

That is until Snapchat and Instagram came along. In fact, in 2018, Facebook stood to lose an estimated 2 million users under the age of 24, according to eMarketer.

Today, an ad placed on Facebook had better be targeted to Gen Xers if it is to be worth its salt.

continued on page 8

TECHNOLOGY NEWS HIGHLIGHTS

AI Blood Test for Alzheimer's

As the average human lifespan continues to increase, neurodegenerative diseases like Alzheimer's disease (AD) are becoming more widespread. And despite an intense research focus, a cure is still elusive, possibly due to the fact that most of the patients who are participating in the trials are already in an advanced stage of the disease.

Now researchers are using machine learning to detect AD earlier, while there is a better likelihood of slowing its progression.

In one recent study, a peptide known as amyloid beta was identified in spinal fluid as being a biological marker for AD long before memory problems become apparent. But testing spinal fluid is expensive and highly invasive, so AI was employed to identify proteins in the blood that can predict the concentration of amyloid beta in spinal fluid. The models they developed may help clinicians identify the risk of AD with up to 77 percent accuracy using a simple blood test.

This is the first study that uses AI to identify spinal fluid biomarkers through blood proteins, and the method can be easily extended to other key indicators of neurodegenerative disease. Such tests will allow researchers to more clearly identify and track onset of these conditions, enabling the development of more effective treatments.

For information: Ben Goudey, IBM Research-Australia, 60 City Road, Southbank, VIC 3006, Australia; Web site: https://www.research.ibm.com/labs/australia/

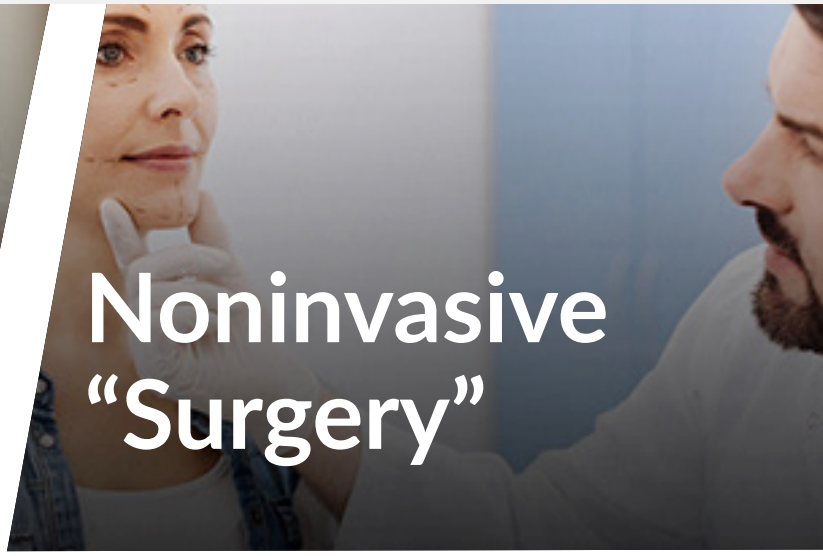
Sound of Silence

An "acoustic metamaterial" was recently demonstrated that can attenuate sound by up to 94 percent. More importantly, the material is permeable to airflow as well as light, making it suitable for many applications where traditional mufflers are not.

Most acoustic materials (such as foam) absorb sound and turn it into heat; however, they generally need to block the entire opening in order to function efficiently. The new material consists of a series of 3D printed rings that work by capturing sound and reflecting it back toward the source. The secret is in the shape, which is mathematically designed for specific frequencies and can be tailored to a wide range of sounds.

For example, MRI machines could be fitted with silencers to make scanning more comfortable for patients. Because the rings are open, HVAC systems and ductwork could be fitted with the material to mute the sound of fans and compressors. They could even be stacked to create soundproof yet see-through walls in open office areas, factories and airplanes.

For information: Xin Zhang, Boston University, Laboratory for Microsystems Technology, 110 Cummington Mall, Boston, MA 02215; phone: 617-358-2702; email: xinz@bu.edu; Web site: http://people.bu.edu/xinz/ or http://www.bu.edu/



Noninvasive "Surgery"

A new process has been developed that can reshape living tissue with no incisions, scarring or recovery time. Using tiny needles, electrical current and 3D printed molds, the technique could transform some cosmetic surgeries into low-cost, five-minute procedures that are performed in a doctor's office under local anesthesia.

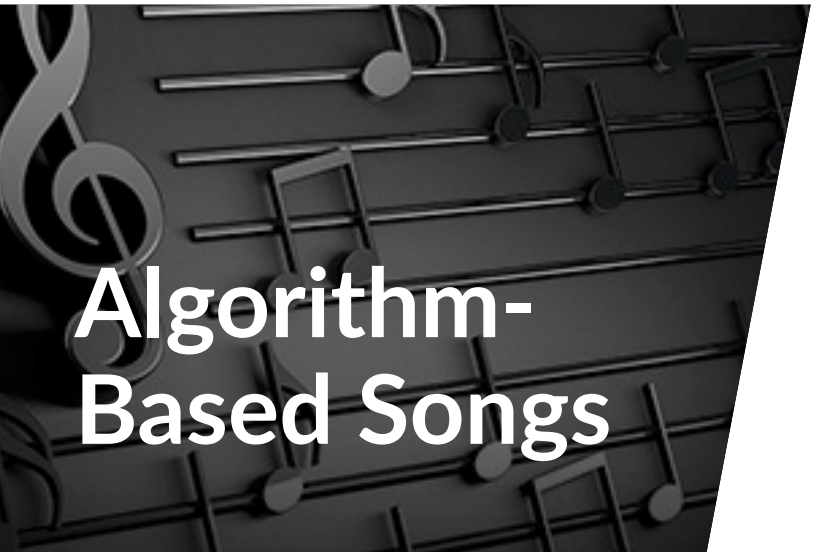
The new method is designed to work on cartilage – the tough but flexible tissue that covers and protects the joints and ends of bones, and is also the primary structural component of flexible body parts such as the ears, nose and rib cage. It's made up of tiny rigid fibers that contain varying densities of negatively charged proteins and positively charged sodium ions. The greater the charge, the stiffer the cartilage.

Earlier noninvasive techniques have used infrared lasers to heat and reshape cartilage, but determining the correct amount of heat that will make the tissue malleable without damaging it has proven to be problematic. Instead, the new method passes current through the cartilage, electrolyzing the water in the tissue to generate positive ions. This cancels out the negative charge from the proteins, reduces the charge density and makes the tissue more pliable. When the cartilage is molded into the desired shape,

the current is turned off and the tissue hardens in its new form. With no mechanical damage to the cartilage, there is no scarring and no painful recovery.

Although an obvious application includes cosmetic surgery procedures, the technique could also be used to treat joint contractures (such as those that are caused by stroke) or to correct vision problems by altering the curvature of the cornea. Licensing options are currently being explored with medical device companies.

For information: Michael Hill, Occidental College, 1600 Campus Road, Los Angeles, CA 90041; phone: 323-259-2766; email: mgh@oxy.edu; Web site: https://www.oxy.edu/



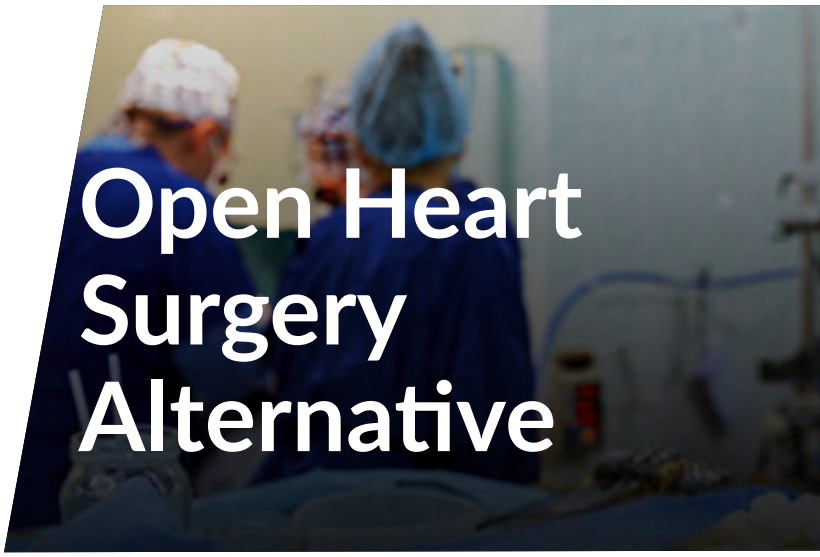
Algorithm-Based Songs

Here's a first for the music industry – a record contract with an algorithm. The goal is to provide customized listening experiences based on user input.

The "music" that's generated by the algorithm is designed to reduce anxiety and improve focus using metrics such as time of day, location, weather and biometrics (such as heart rate), creating tailor-made "sound frequencies" that are reflective of the listener's context. Ultimately, the developers would like to interconnect other hardware and software systems that take into consideration a user's calendar, driving patterns and other information sources to be even more adaptable. The resulting sounds are meant to blend into the background rather than be "listened to" like traditional music.

A total of twenty algorithm-based albums will be released this year. Five are already available on services like Apple Music and Spotify as a collection of "sleep soundscapes," including Clear Night, Rainy Night, Cloudy Afternoon, Cloudy Night and Foggy Morning. Others will be focused on calming the mind, improving concentration and boosting personal energy. The contract with Warner Music Group covers distribution and publishing. The copyrights will be retained by the software engineers who created the adaptive code.

For information: Endel; Web site: http://endel.io/



Open Heart Surgery Alternative

A less invasive alternative to open heart surgery could change the standard of care for patients requiring aortic valve surgery. Known as TAVR (Transcatheter Aortic Valve Replacement), the new procedure eliminates the need to crack open the rib cage, stop the heart and place the patient on a heart-lung bypass machine.

Instead, TAVR is performed by inserting a catheter either through the femoral artery in the groin or through a small incision in the chest. The mechanical valve is guided into place and, once it reaches the aorta, it expands to push the failing valve aside. Most patients do not require general anesthesia, but undergo the procedure under sedation, and the recovery time is reduced from months to days.

The results of two clinical trials on more than 1,000 subjects indicate that the rates of death, stroke and hospitalization in the year following surgery were substantially reduced with TAVR as compared to traditional surgery. Approximately 60,000 intermediate and high-risk patients in the United States qualify to receive the procedure annually. Pending approval by the Food and Drug Administration for lower risk individuals, as many as 20,000 additional patients per year could avoid open heart surgery using this technique.

For information: American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231; phone: 800-242-8721; Web site: https://www.heart.org/en or https://www.heart.org/en/health-topics/heart-valve-problems-and-disease/understanding-your-heart-valve-treatment-options/what-is-tavr

Leak-Detecting Robot

As infrastructure continues to deteriorate, it has been estimated that 20 percent of the world's clean water supply is lost due to leaks. In the United States alone, 240,000 water main leaks waste more than 2 trillion gallons of treated drinking water every year. And in many places, the location of water mains and pipes is not even known.

Current leak detection methods rely on sound detection, but these methods are unreliable in urban areas due to ambient noise levels. Now an MIT graduate has developed a solution that not only detects leaks more reliably; it also generates a map of the system, identifies where the leaks are and how large they are, and calculates the probability of catastrophic failure.

Known as Lighthouse, the robotic device resembles a badminton shuttlecock. The flexible device can travel through pipes without interrupting service while its "hands" touch the pipe, locating leaks by detecting suction forces.

Released in January, Lighthouse has been tested in Virginia, Saudi Arabia and the United Kingdom. Pilot programs are also being conducted in Massachusetts and Australia.

For information: You Wu, Watchtower Robotics, Boston, MA; email: info@wtrco.com; Web site: https://www.wtrco.com/

Robotic Barista

In the quest for the perfect cup of coffee, one company has made it possible for you to get exactly what you want – every time. The Coffee Haus robot doesn't just make coffee; it does so with absolute robotic precision by automatically adjusting extraction parameters (i.e., the grind, ratio of beans to water, water temperature and brewing time) to deliver your perfect cup more quickly and reliably than human baristas can. One system can turn out about 100 cups an hour.

A smartphone app allows you to order remotely and pick up your beverage in a locked area via a code that is sent to you by text. Or you can place an order at kiosks located in shopping malls or on the street. But coffee shops equipped with one of these robotic baristas see them as an opportunity to free up human attendants to focus on customer service, and the robots have a personality of their own as they wave to onlookers.

Coffee Haus robots have been installed in several locations throughout Texas, California and even Shanghai.

For information: Briggo, Inc., 11000 North Mopac Expressway #150, Austin, TX 78759; phone: 512-861-8884; Web site: https://briggo.com/

Diagnostic App for Cervical Cancer

In yet another example of machine learning, researchers have developed an algorithm to screen women for cervical cancer using a digital photograph. Known as "automated visual evaluation," this artificial intelligence (AI) technique could revolutionize screening methods, particularly in low-resource environments.

The most common way to identify cancerous or precancerous cells in the cervix is through a pap smear in which cell samples are sent to a lab for analysis. But in regions that lack the needed laboratory resources, doctors use a method that involves swabbing the cervix with dilute acetic acid and visually inspecting it for white spots that could be indicative of cancer. Instead of a simple visual inspection, researchers decided to photograph more than 9400 cases and use the images to train a deep learning algorithm that detects abnormal tissue. The results were then compared to findings by independent experts and it was concluded that the computer performed better than human reviewers regardless of whether the testing was done using the acetic acid method or a pap smear.

The developers plan to further refine the algorithm and adapt it for use on mobile phones.

For information: Mark Schiffman, National Cancer Institute; Web site: https://www.cancer.gov/news-events/press-releases/2019/deep-learning-cervical-cancer-screening

Content Trends Move Fast Advertisers Must Learn to Anticipate

continued from page 1

What's Next in Target Marketing?

To add to the challenges of the last couple of decades, smart speakers are now in about one-quarter of U.S. homes, and podcasts are gaining popularity. In fact, about 50 percent of households now say they listen to podcasts, with a majority of them joining the trend in just the last three years.

According to whypodcasts.org, 38 percent of listeners are age 18-34, and 64 percent listen on their smartphones.

As I have written before, as technology-driven change changes direction, it is easier, and far more profitable, to change direction with it. "It's easier to ride a horse in the direction it is going." That's what my grandfather told me as a little boy working with him on his farm in Texas. It was good advice for me then and is still relevant to many of us in business today.

Every company, regardless of size, knows they must advertise if they are to grow. Yet with all the money that is being spent, it is increasingly difficult to get your message to the right audience.

This is where it pays to be anticipatory. Using the systemic method outlined in my Anticipatory Organization Model, you can ready your organization for the disruptive transformations ahead.

The Anticipatory Organization (AO) comprises four key disciplines: Knowing What's Next; Developing New Opportunities; Accelerating Success; and even Shaping the Future.

Five Hard Trends to Help you Anticipate

In my work as a technology strategist, business futurist and disruptive innovation expert, I have found the most effective way to approach becoming an Anticipatory Organization is to focus on three primary trend categories: demographics, government regulations, and technology.

Next, you will need to learn the truth about trends like consumer multi-layered media and consumer engagement.

1. **Demographics drive opportunity.** For instance, there are nearly 80 billion baby boomers in the United States. Not a single one is getting any younger—a definite Hard Trend. We can see the impact of an aging population and the opportunities, as well as challenges, this represents before they happen.

2. **Government regulation is a constant.** Here, a broad question immediately comes to mind: As a general rule, will there be more or less government regulation in the future? Of course, there will be more, and that's true regardless of the industry or organization... Whenever a new law is passed, there are both predictable opportunities and consequences. In addition, many new regulations have a form of funding, either in money or tax incentives, to encourage the underlying change the regulation is seeking. That's also a Hard Trend.

3. **Technology will continue to grow.** From the ever-increasing functional capabilities of our smartphones to the growing use of 3-D printing, technology is inevitably going to become more functional, more sophisticated, and more widespread. That's another definite Hard Trend.

4. **Multi-layered media is here to stay.** According to research, our attention spans are shorter than ever, and consumers demand instant gratification and quick fixes—not a litany of product features and benefits. Today, content channels such as social media, Apple Watch, and Google Home provide the perfect vehicles for interactivity at any time, in any place, and with any person.

5. **Consumer attention is likely to stay at a premium.** At least for the foreseeable future, multi-layered media is here to stay. Consumer attention remains at a premium. Advertisers know the harsh reality: Running an ad on a major television network and supplementing it with web banner ads is no longer a guarantee of reaching the audience.

If you use my Hard Trends Methodology to look ahead to the future of advertising, you'll be able to anticipate that the next decade will move even faster than previous decades of innovations. New devices are likely to be developed, and their connectivity doesn't show signs of slowing any time soon.

Companies that disrupt entire industries and grow at an exponential rate have developed "the missing competency" that allows them to anticipate the future with remarkable results.

Some companies (like Amazon, Apple, Uber, Netflix, and Facebook) have anticipated future disruptions and created game-changing innovation to capitalize on them.

The Anticipatory Organization® Model is just as powerful for individuals and small groups as it is for larger organizations. Moreover, these anticipatory skills and strategies can be used by all members of an organization to build an environment characterized by innovation, collaboration, and a confident, shared view of the future.

Learn to be anticipatory—start with my book, the Anticipatory Organization, available to you for just the price of shipping at www.TheAOBook.com

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.