

June 2016
VOL. XXXII, NO. 6

Daniel Burrus'

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TECHNOTRENDS® NEWSLETTER

*The biggest ideas that are
changing everything*

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How Gamification Can Alter Our Behavior

By Daniel Burrus, CEO of Burrus Research

During this unique period of technology-driven transformation, the education sector has so far been slow to embrace the power of digital tools that can be used to accelerate learning.

Spending time, energy and money protecting and defending conventional teaching methods only postpones the inevitable and keeps the transformative power of digital disruption, when used wisely, from taking training and education to a new level of success.

The problem is that whether it's a child in a classroom or an adult in a corporate training environment, the young and old have one thing in common. Our attention span is now officially lower than a goldfish now that external stimulation from digital, social and mobile access has reshaped our world.

“ ***The average smartphone user checks their phone over 100 times a day*** ”

Recent studies have shown that the average smartphone user checks their phone over 100 times a day. Checking any one of our four to five screens for emails, messages and notifications every few minutes is finally starting to take its toll on our ability to focus on a task at hand.

This is forcing a dramatic rethink of how we can help people of all ages learn, comprehend and retain the knowledge they need to take their

lives and careers to the next level. In a world littered with distractions, it seems that providing a dynamic, immersive, engaging and social experience is the key to accelerating learning.

One powerful way to accelerate learning for both business and education is to add gaming elements (gamification) to teaching and learning.

Why gaming? When you play a game, you are not alone; there is a social element combined with a competitive element that forces you to both engage and concentrate, and that is a powerful combination if you want a student to learn something. It is also a way to make education and training fun as well as creating a personalized experience.

In the past I have written many articles about implementing gamification elements into learning, especially for younger students who grew up playing video games.

In this article, I want to take a look at how gaming can be applied in a simple way to both change behavior and achieve goals—in this case, the success organizations are getting from the use of a simple wearable, the Fitbit activity tracker.

On its own, wearing a wristband that counts your daily steps is relatively simplistic, and some

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TECHNOLOGY NEWS HIGHLIGHTS

Quantum Cloud

First proposed over 30 years ago, quantum computing has been hailed as the holy grail of computing technology for its ability to perform advanced calculations and solve problems that are seemingly impossible, even for today's supercomputers. Recently, IBM announced a first-of-its-kind computing platform that will allow users to access their experimental quantum computer processor via the cloud, enabling new levels of innovation and new applications for quantum technology.

Quantum computing takes advantage of the fact that molecules behave differently at the atomic level. Instead of encoding bits of information as ones and zeroes, quantum computers utilize a property known as superpositioning to encode data as either one, zero or both. These packets of information are known as qubits, and packaging them together in a scalable and controllable way represents some very real challenges. For example, quantum processors are extremely

sensitive to errors from heat and electromagnetic radiation, so the system must be kept at supercooled temperatures in a cryogenic dilution refrigerator. This first functioning quantum processor contains five qubits, however researchers envision that computers with 50 to 100 qubits could be available within the next decade.

The IBM Quantum Experience is accessible to researchers, students and science enthusiasts in general on any desktop or mobile device. Users wishing to gain access must request an invitation on the web at <https://quantumexperience.ng.bluemix.net/qstage/#/signup>

For information: IBM Corporation, 1 New Orchard Road, Armonk, NY 10504; phone: 914-499-1900; website: <http://www.research.ibm.com/quantum/>

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Multiple Virus Vaccine

As we all know, treating viruses is difficult because the same strain can mutate, making last year's vaccines ineffective. And because different viruses are vastly dissimilar, creating a vaccine that combats multiple diseases seems like an impossible task.

But a group of researchers has come up with a macromolecule that has the potential to treat several viruses by focusing not on what makes them different but what they have in common.

Most antivirals target the RNA and DNA of the organism. Since this is the very thing that distinguishes each strain from others, this approach requires a different vaccine for each type of virus – and all of its mutations.

The new macromolecule focuses instead on glycoproteins, which are present on the outside of all viruses and work to attach the cells to the body. Using electrostatic charges, the macromolecule attracts the virus toward itself and attaches to it, making it unable to attach to healthy cells. It then neutralizes the acidity levels in the virus, hindering its ability to replicate.

Finally, the macromolecule enhances the body's own immune response by attaching a sugar (called

mannose) to the immune cells. This forces them closer to the virus, enabling them to be more effective at fighting it.

The treatment has been tested on Ebola and dengue with good results. Although further testing will be needed before it can be used as a treatment, the macromolecule represents a huge step toward the development of broad-spectrum antivirals.

For information: Yi Yan Yang, Institute of Bioengineering and Nanotechnology, 31 Biopolis Way, Singapore 138669; phone: +65-6824-7106; email: yyyang@ibn.a-star.edu.sg; website: <http://www.ibn.a-star.edu.sg/>



Affordable Exoskeleton

In recent years, many advancements in robotics have been focused on enhancing the personal mobility issues of the disabled and aged, as well as offering body-booster technology for industrial workers, nurses, firefighters and soldiers.

The problem is that all of these technologies have been too expensive for widespread individual use. But a new system has recently become available that brings the cost within reach for many more individuals.

The Phoenix robotic exoskeleton is designed to minimize weight, complexity and cost while

maximizing intelligence – including gait analysis and self-stability.

The modular design is adjustable and configurable to user needs, and movement is controlled by buttons integrated into a pair of crutches.

The system weighs about 12 kg (27 pounds) and enables users to walk at speeds of up to 1.1 miles per hour. A battery backpack provides power for up to 8 hours of operation on a full charge.

The current cost of \$40,000 is less than half of previously available systems, although there's still room for improvement.

For information: U.S. Bionics, Inc., Berkeley, CA; email: press@suitx.com; website: <http://www.suitx.com/>

developed an ultrathin glass that flexes like plastic and can be made with electronics embedded in it.

Continuously manufactured in rolls one-half meter (about 18 inches) wide and half a kilometer (about a quarter of a mile) long, it resembles cellophane and can be folded repeatedly down to a radius of 9 millimeters (about three-eighths of an inch) with no signs of fatigue.

The key to its strength is a down-draw manufacturing process that enables the molten glass to be shaped in a controlled manner.

Glass is an amazingly strong material and only breaks as a result of micro-defects that propagate under stress.

The new process is capable of producing specialty glass products between 25 and 500 micrometers thick with very few imperfections and a roughness of less than one nanometer.

It can also be cured through ion exchange to yield a product that is four times stronger than non-tempered glass.

The first consumer product to utilize the new glass will be a smartphone fingerprint sensor, but the technology will also have applications for faster processors and smaller chip packages that are more thermally and dimensionally stable than current designs while boosting energy efficiency.

For information: Schott North America, Inc., 555 Taxter Road, Elmsford, NY 10523; phone: 914-831-2200; fax: 914-831-2201; website: <http://www.us.schott.com/english/index.html>



Imagine being able to open up your smartphone screen into a tablet-sized display.

Glass manufacturers are already working on producing “foldable” glass, which would allow just that. And although they’re not quite there ... they’re very close.

For example, one German manufacturer has



Autonomous Drone

Most of the drones available today are controlled remotely by an operator, with minimal automation.

But experts agree that, in the future, drones will be needed to perform much more sophisticated surveillance and inspection tasks – and that will require a much higher level of autonomy.

Autonomous flight is more difficult to achieve than autonomous driving, but a new autopilot system for drones was recently unveiled that utilizes a series of video cameras along with vision-processing software, allowing unmanned aerial vehicles (UAVs) to navigate through unfamiliar territory without operator intervention.

The technology is so responsive that a plane with a two-foot wingspan is able to fly around a busy parking garage without crashing. The system also features a simpler user interface that replaces conventional “joystick” controllers.

A smartphone-based “magic wand” enables a user to control the direction of flight simply by pointing their phone where they want the drone to go.

The developers don’t intend to manufacture

drones but are planning to have the system ready for release sometime this year.

For information: Adam Bry, CEO, Skydio, Menlo Park, CA;
website: <http://www.skydio.com/>



3-D Printed Snacks

The 3-D printing revolution has touched many areas of our lives – from its meager beginnings as a means of creating small prototype parts to printing buildings, automobiles, aircraft and bridges. Now a group out of Finland has combined 3-D printing technology with expertise in food and material science to produce customized food.

According to their research, while consumers are demanding healthier and more nutritious foods, they’re also looking for good taste, texture and design.

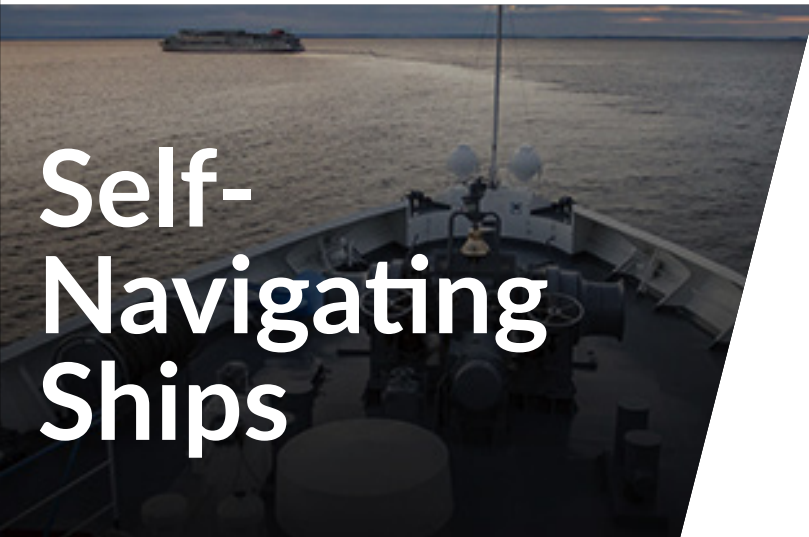
In short, people like food to be “fun.” What better way to accomplish that than a high-tech vending machine for “printable” snacks?

The group has already experimented with starch and cellulose-based materials to develop flow properties that are suitable for 3-D printing technology.

They are also working on printing proteins from concentrates of oats, fava beans and whey. But the ultimate goal is to be able to combine textures – such

as crunchy toppings with soft centers – that can be printed in layers to create a distinctive mouthfeel.

For information: Sozer Nesli, VTT, P.O. Box 1000, FI-02044, Finland; phone: +358-20-722-7070; email: nesli.sozer@vtt.fi; website: <http://www.vttresearch.com/> <http://www.vttresearch.com/media/news/vtt-is-developing-customised-snacks-through-3d-food-printing>



Self-Navigating Ships

There are lots of good reasons to develop ships that can run without captains or crews. In military applications, they can hunt for submarines and underwater mines without endangering lives.

In the commercial sector, they could not only reduce costs but also improve safety in areas that are plagued by pirates.

The Defense Advanced Research Projects Agency (DARPA) will soon be testing a new generation of unmanned ships off the coast of San Diego. Called the “Sea Hunter,” it’s nothing like the remote-controlled vessels that are currently in use.

The 132-foot, self-driving ship can travel up to 10,000 nautical miles at a speed of up to 30 miles per hour and is equipped with radar, sonar, cameras and global positioning systems to maneuver itself.

Although the ship will be manned with human

operators during the testing phase, it is designed to be deployed for months at a time – able to travel from San Diego to Guam on twin diesel engines.

The prototype cost about \$120 million to develop, but DARPA states that additional vessels will be able to be produced for about \$20 million each.

For information: Defense Advanced Research Projects Agency, 675 N. Randolph Street, Arlington, VA 22203; phone: 703-526-6630; website: <http://www.darpa.mil/>



100-Year Battery

A prototype, non-rechargeable battery has been developed that can operate in standalone mode for up to a century.

Designed for long-life, low-energy applications that require no maintenance, the battery could be used as an independent or auxiliary power source for devices such as sensors, sleeper transmitters, gas detectors and fire detectors.

The technology is based on what is known as the betavoltaic effect – using beta radiation from decay of a radioactive isotope (nickel-63) to generate electrical current in much the same way that solar cells convert sunlight. Nickel-63 is a “mild” and clean radiator that decays into a stable copper isotope, so the batteries don’t need special recycling.

The system is safe because, unlike harmful gamma radiation, beta rays do not penetrate deep into the human body. In addition, the radioactive nickel is shielded inside the battery to prevent radiation leakage.

One of the main advantages of Ni-63 is that its efficiency and power output actually increase in lower temperatures, so it can be used in settings where lithium ion batteries can't, such as Arctic and Antarctic environments.

The biggest limiting factor to widespread availability is the current high cost of Ni-63, however, it is expected that industrial production of the isotope would reduce cost of the battery by about 90 percent.

For information: Viktor Murashev, National University of Science and Technology MISiS, Leninsky Avenue 4, Moscow, Russia; phone: +7-495-638-4678; website: <http://en.misis.ru/>

Everest in the steps they take and track their progress with their company-provided Fitbit. There is a virtual map that shows where each employee is along the journey. A major health benefit is that employees are losing weight, lowering their cholesterol levels, and some are getting off their medications to lower their blood sugar levels.



How Gamification Can Alter Our Behavior

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would even say uninspiring. But, when it comes to technology, it's not the tool, it's how we use it.

In this case, by setting up internal contests within organizations that are not only competitive but also have prizes, in some cases as simple as virtual badges for walking a certain amount of miles a week, seems to create positive and healthy behavior changes.

One large organization is currently having a competition for its employees to climb Mt.

I have also run across a few organizations that have taken this a step further by allowing employees to add friends to a leaderboard, and once again it's all about snatching glory by rising to the top on a cold dark Wednesday evening that is helping both Fitbit and its users lose weight and achieve their performance targets.

Most of us are naturally competitive and can't resist comparing ourselves to others. When a company hosts a walking competition and measures their employees' performance and progress with a wearable activity tracker, it's usually the "who will finish at the top of the leaderboard" aspect that typically captures the imagination of everyone involved.

The success of Fitbit alone is a testament to how this simple form of gamification has become very big business. Being assigned goals and then

being rewarded for achieving them with a virtual badge or small prize illustrates how even this simplified principle can produce fantastic results in changing behavior.

There is even an argument based on some early research that indicates momentary gratification from screen-based media can increase our visual-spatial intelligence.

Over the years we have been told that television and even calculators would make us stupid, so we shouldn't be too surprised to see many pointing the finger of blame at technology again.



It's true that for many low-level jobs, employees no longer need to know how to add or subtract, much less multiply and divide, not to mention reading a map. Our smartphone can deliver answers almost before we even think about the question. In reality, technology is not stopping us from thinking, but it is changing the way in which we look for, process and retain information.

We might not want to admit it, but thriving on instant gratification and frequent rewards has almost become a way of life. As we drift from screen to screen on up to five devices, we shouldn't be too surprised to learn how we

increasingly need to visualize content to digest fully or comprehend subject matter.

I often hear people even likening their work experiences to that of a video game. Many find parallels with gaming characters by learning and mastering skills so they can "level up" in life just as they would in a video game. If these unconventional methods can engage audiences but also teach persistence and resilience, is that such a bad thing?

In this fast-paced digital world, classrooms often run the risk of feeling uninspired, dull and dare I say boring to students of any age. Engaging with users to provide a fun, personalized learning experience that is also interactive, game-like and competitive is the secret recipe to capturing our attention.

Gamification is often misunderstood or seen as either too complex to implement or just another gimmick. But these examples of using a simple form of gamification to accomplish a goal illustrates that it is possible to start small and learn to walk before you run.

The next time you're in a meeting, take a quick look around the room and notice how many already have wearable tech attached to their wrists as they discuss achieving fitness goals and even winning company competitions.

It is estimated that 13 million wearable activity tracking devices will be integrated into employee wellness programs by 2018, and most will involve a competition to get increased engagement. Has your organization created a competition to achieve a group or individual goal by using a wearable like a Fitbit or Apple Watch yet?



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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.

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