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*The biggest ideas that are
changing everything*

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Disruptor Watch

How Disruptors Can Learn From Their Forebears

By Daniel Burrus, CEO of Burrus Research

In today's vastly complex economic landscape, many companies would like to be "disruptor" instead of being the "disrupted" — that is, they want to find a new niche in a certain industry, a problem no one's yet been able to solve or one nobody's aware of, and they want to exploit this niche and solve this problem, thereby upending their industry with next-gen technology and unprecedented business methods.

However, with every disruptive tech company, there are obvious caveats and pitfalls to note, and it behooves would-be entrepreneurs and innovators to observe and learn from both the successes and the mistakes of their recent forebears.

A new technology disrupting the fashion photo industry

Let's look at Focal Media Group, creator and producer of the disruptive StyleShoots photography machine. StyleShoots, which is being heralded as "The next generation photo studio," puts more power in the hands of major fashion retailers and the creative agencies they work with. Essentially, the machine, which would take up most of a small studio or room, automates much of the work associated with photo editing, such as basic Photoshopping. Its interface is extremely user-friendly and could even allow someone with very little photography experience to create consistently high-quality image content. This allows major fashion retailers and brands to cut down on production costs and time to market, allowing for huge revenue growth by

granting them longer sales windows. For creative agencies, having a StyleShoots machine does much of the same, allowing them to turn around quality content much more quickly than before; this, in turn, frees agencies up to compete for more business and puts them ahead of their competition in general.

Now, while this technology could have wide applications in the photography world, they're already seeking to carve out a niche for themselves—fashion product photography—before seeking to expand; this is a wise move, in my opinion, as such a young company wouldn't want to spread themselves too thin, so to speak, by trying to appeal to a broader range of industries.

“ Pay attention to what people are saying about you in real-time. Pay closer attention to both the quality of your product and how you can keep it as high as possible.

By relegating themselves to the world of fashion product photography, Focal Media Group has already gained a slew of high-profile brands as clients: Macy's, Triumph, Forever 21, Toys R Us, Zalando, Woolworths, and Scotch & Soda, to name a few.

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TECHNOLOGY NEWS HIGHLIGHTS

Sonic Tractor Beam

While it's not quite the stuff of Star Trek, a new technique has been developed for manipulating small objects using high-amplitude sound waves. The breakthrough could lead to sonic production lines for assembling delicate objects, or microsurgical instruments that move through living tissue, all without the need for physical contact.

Anyone who has felt the impact of a sonic boom, or the beat of a good sub-woofer, knows that sound has a physical effect on matter. But a group of scientists recently illustrated that such effects could be controlled to a degree that was never before possible. Using an array of 64 miniature loudspeakers, they created a high-pitch, high-intensity acoustic force field that was capable of holding an object in mid-air. They also found that the object could be moved or rotated by carefully controlling the output of the loudspeakers individually.

Three different types of acoustic force fields are described in the research – one that works like a “holographic tweezers” to hold an object in place, one that functions as a vortex to trap an object at its core, and one that surrounds objects like a high intensity cage. Although they may not be ready to take on Klingon warships, these acoustic “holograms” could have profound impacts in any number of future applications.

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Exercise Drug

Researchers have found that exercise triggers about 1,000 different molecular reactions, and they have now documented these reactions to create a comprehensive “exercise blueprint” of human muscle. With this roadmap, it should be possible to analyze the beneficial changes and develop therapeutic models for drugs that mimic exercise. Such drugs would be targeted at individuals suffering from a variety of diseases and disorders for whom exercise is not a viable treatment option, including those with neurological disorders, cardiovascular disease and type 2 diabetes.

While it has long been known that exercise is a powerful therapy for many diseases, and that it produces a cascading series of responses within human muscle, the true complexity of these changes has not been fully understood until now. In a study of four healthy males, the researchers took biopsies of skeletal muscle following 10 minutes of high intensity exercise. Using mass spectrometry, they analyzed a process known as protein phosphorylation and discovered that a majority of the changes that occurred were previously not even associated with exercise.

Since prior research focused on a small subset of molecular changes, the drugs available today are generally designed to target individual molecules. This research proves that, in order to be effective, future therapies will need to target multiple pathways – and now we know what they are.

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“Anticipatory” Vehicles

In the U.S., ninety percent of accidents are caused by driver error. With more cars on the road and more distractions than ever for drivers it's no wonder that auto manufacturers are looking for ways to enhance driving safety through automatic steering and braking systems. Now a project known as Brain4Cars is exploring ways to make these systems even more intelligent by predicting what a driver is about to do next.

An experimental dashboard computer has been designed which uses deep machine learning to recognize the actions, body language and behavior that precede a particular driving maneuver. For example, a lane change may be preceded by a glance over the shoulder and a check of the rearview mirror as well as changes in speed, steering and acceleration. The system would combine this information with the car's built-in sensors and cameras to alert a driver when someone has pulled into that lane, or even prevent them from performing the maneuver. On the other hand, if the system senses that a driver is distracted, but there is no imminent threat ahead of them, it may suspend unnecessary alerts.

The algorithms were developed from data collected on ten different individuals driving nearly 1,200 miles and were found to be over 90 percent accurate in predicting a driver's intention to change lanes. The researchers intend to make the data collected freely available to auto researchers and academics.

Some may think that monitoring drivers will become less important with the dawn of autonomous vehicles. However, the opposite is actually true. As drivers are allowed to increasingly divert their attention while their vehicles do the driving, it will be more important than ever to be able to assess their behavior during those times when they do need to retake the wheel, since it can take several seconds for a person to fully engage, depending on their level of distraction.

For information: Saxena Ashutosh, Cornell University, College of Engineering, Carpenter Hall, Ithaca, NY 14853; phone: 607-255-4326; fax: 607-255-9606; email: asaxena@cs.cornell.edu; Web site: <http://brain4cars.com/>

The event was centered around the introduction of the world's first professional 3D printer designed exclusively for food. The ChefJet Pro is a large-format 3D printer that can produce full-color, photographic quality goodies using a variety of confectionary recipes, including sugar, fondant and sweet and sour candy flavors. It has a build volume of 8" by 8" by 8", runs at a speed of about 2 vertical inches per hour and can create just about anything you can imagine from logo sugar cubes to delicate candy latticework.

The lab will be used to host additional events for collaborators – including chefs, mixologists, artisans, and other partners across the culinary and hospitality industry – to explore the myriad possibilities for 3D printed food.

For information: 3D Systems, Inc., 333 Three D Systems Circle, Rock Hill, SC 29730; phone: 803-326-3900
3DS Culinary Lab, 6624 Melrose Avenue, Los Angeles, CA 90038; Web site: <http://www.3dsystems.com/culinary>



Digital technology entered the culinary limelight with the recent premier opening of the 3DS Culinary Lab in Los Angeles. Guests were treated to a variety of dishes that featured 3D printed elements, such as pumpkin and maple waffles, wasabi eggs, passionfruit sugar flowers and candy-cap mushrooms. Perhaps the most intricate was a sugar sculpture that, when broken, revealed a creamy passionfruit curd...truly a dessert of the future!



Several different researchers have been looking at making 3-dimensional batteries from porous materials to reduce weight and develop form factors that were previously impossible (See for example "Wooden Batteries" TTN June 2015). The porous nature of foam also has the potential to drastically increase power and energy density, since a very small fragment can contain a very large surface area, and the distance that ions have to travel is greatly

reduced. However, past attempts at producing a reliable foam battery have been met with a number of challenges, including long recharge times and the inability to hold a charge.

A new 3D solid state battery was recently unveiled that overcomes these challenges, while utilizing common materials and low-cost manufacturing processes. It starts with a substrate of copper foam onto which the anode (copper antimonide) is electroplated. A polymer electrolyte, which is permeable to ions but not electrons, is layered on top of the anode. The cathode is then applied as a dark, inky slurry and the battery is sealed in a plastic pouch.

In addition to storing up to twice the energy per unit volume as conventional batteries, the new battery does not overheat like lithium ion batteries are prone to do. Because they're three-dimensional, foam batteries could be designed to fill in existing empty spaces within an electronic device, providing longer battery life without increasing the size of the product. And although initial applications are likely to be in the consumer electronics market, foam batteries may someday be used in electric vehicles and even grid-scale power storage.

For information: Amy Prieto, Prieto Battery Inc.; Web site: <http://www.prietobattery.com/>

Reclaiming Rare Earth Elements

Rare earth elements are vital to the production of a variety of technologies, including the drive units and motors of electric hybrid vehicles. But with up to 97 percent of these materials being supplied by a single country – China – it is becoming increasingly important to find alternative sources as the applications for rare earths continue to increase.

A two-step chemical process was recently developed that is capable of extracting rare earth elements – specifically neodymium, dysprosium and praseodymium – from the magnet of an electric motor. To test it, the drive unit of a Chevrolet Spark was sliced into several pieces and then shredded. In addition to successfully separating out the rare earths, the method also yielded other recyclable materials including steel chips.

Separation and recovery technologies such as this could prove to be valuable alternative sources of many vital materials, further reducing our dependence on imports.

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One of the biggest logistical problems of home delivery is what's known as the "last mile" – getting goods such as groceries, prescriptions and small packages to the buyer's door. Deploying vans which stop every few minutes so the driver can disembark, knock on the door, and wait for an answer is time-consuming and inefficient, which is why companies like Amazon and Google have been looking at drones to accomplish the task. But the co-founders

of Skype are taking a more practical, ground-based approach.

A distant descendent of Shakey – the first autonomous robot funded by the Pentagon as a sentry for military bases – the new delivery vehicle looks a bit like an oversized cooler on wheels. With a carrying capacity of 40 pounds, it's designed to be loaded at a compact warehouse (the developers envision this being a converted cargo container that can be placed in a parking lot) and then navigate its way to its destination using city sidewalks. Customers will use a smartphone app to retrieve their packages. It's even possible to examine their purchase while the robot waits, and return items immediately if they decide not to keep them. The developers estimate that deliveries can be made for as little as \$1.00.

The autonomous vehicle will travel at a top speed of four miles an hour, has a range of up to two miles, and is powered by an electric motor that consumes only 50 watts of power. Although it has cameras and radar, it doesn't require expensive, high resolution sensors like Lidar, so it's less costly to build than a drone. An LED-lit flag makes it easy to spot by pedestrians and drivers. It will also be able to communicate with any humans it encounters through built-in speakers and microphones, and can call on a remote human operator if it encounters a navigation puzzle that it can't solve – such as crossing a busy intersection. Theft is a concern, but a minor one, thanks to high resolution video and GPS tracking sensors that would need to be disabled – and then, what's the point?

There are a few regulatory obstacles to be overcome, as some municipalities do not allow motorized vehicles to travel on sidewalks. But other transportation mediums (such as Segway) have successfully negotiated similar exemptions in many areas.

For information: Starship Technologies, Teaduspargi 8, Mehhatroonikum, 12618 Tallinn, Estonia; Web site: <https://www.starship.xyz/>



Space Blimp

China recently test-launched a near-space airship loaded with wideband communication and data relay equipment as well as high definition cameras, sensors and spatial imaging technology. Dubbed Yuanmeng, it will eventually provide constant surveillance over a hundred thousand square mile area for advanced warning of military threats, and will also supply backup for communications satellites. As part of a network designed to detect and track potential enemy targets, the dirigible-style aircraft will combine its own data with data gathered from other sources such as satellites, submarines and drones, while cruising at an altitude that keeps it out of range of most missiles.

The gigantic 250-foot airship occupies a volume of 18,000 cubic meters (635,664 cubic feet) and can carry payloads of more than 50 tons. Powered solely by helium and electricity – generated by solar panels mounted on the outer surface – it will eventually be able to stay airborne for more than six months without the need for fuel.

Airships are a logical choice for use in the near-space region of the atmosphere, which lies between 10 and 20 kilometers (65,000 and 328,000 feet) above sea level. At these altitudes, there simply isn't enough air to support the wings of traditional aircraft. But floating an airship at an altitude of 12 miles above the earth's surface is not without challenges, such as the temperature extremes that occur from day to night.

For information: The People's Daily, No. 2 Jintai Xilu, Chaoyang District, Beijing 100733, People's Republic of China; phone: +86-10-6536-3689; fax: +86-10-6536-3688; Web site: <http://en.people.cn/n/2015/1014/c90000-8961965.html>

Digital Disruption

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They've also sold StyleShoots machines to major creative agencies like Pure Red and Undeclared Creative.

Clearly, this is a technology to keep an eye out for, because these early adopters are already experiencing the benefits of reduced photography and production costs, as well as a reduced time to market.



However, it would still behoove the StyleShoots/Focal Media folks to pay attention to their recent forebears and to take close note of their respective successes and shortcomings.

Here are some things they should be wary of and willing to address:

Lowering the barrier of entry

While the StyleShoots machine is being adopted by major fashion retailers, very few people in the industry are aware of its technology and the savings and added revenue it could likely provide. This means Focal Media Group could stand to use both social and traditional media to expand their marketing campaign in order to create awareness. If the only thing preventing a product from turning its target industry upside down is awareness, a solid marketing campaign will prove invaluable as other recent successes have discovered.

Learning from the new big boys: Airbnb and Uber

I've written extensively about companies like Airbnb and Uber — how they've disrupted their respective industries and succeeded at creating enormous, widely acclaimed brands and user experiences. However, these organizations have succeeded hugely in some areas of business and failed spectacularly in others.

Let's look at how a company like Focal Media Group can benefit from paying attention to what Airbnb's been doing these past few years.

In the upcoming documentary *Design Disruptors*, Airbnb Head of Experience Design Katie Dill gives some insight into what makes the company so effective from a design standpoint: essentially, Airbnb leverages design and aesthetics to facilitate a better overall user experience, which has clearly proved successful.

According to Clark Valberg — CEO of InVision, the company producing *Design Disruptors* — “Airbnb's Katie Dill explains that the design team is not a ‘design’ team, but an ‘experience’ team. They consider every touch point with a user, from first click to when a guest enters a host's home, a point within an intentionally-designed,



overarching brand experience. They stay true to this vision by including their community in their experience design processes.”

Here, Valberg and Dill are effectively touting design as a means to creating a more comprehensive, friendlier, more beautiful user experience, which, as we all know, is key to the success of any startup.

Focal Media Group would do well to focus on creating a user experience that makes prospective clients feel at ease, like they can easily operate the StyleShoots machine or teach their colleagues how to use it. The experience should also explicitly illustrate how brands, retailers, and agencies stand to benefit from using StyleShoots and its related products for their photography.

Now, let’s take a look at Uber in terms of user experience and quality control. It’s hardly a secret that the company’s come under a great deal of fire of late: numerous accusations, worldwide, of sexually aggressive, predatory, or even outright violent drivers (which equates in the minds of customers to lax hiring policies and a company that implicitly doesn’t care about the safety of its riders); accusations of “digging up dirt” on journalists who would

criticize the company; accusations of real-life sabotage committed against rival companies like Lyft; accusations of stealing jobs from local taxi drivers and attempting to undermine their unions.

Naturally, this has turned into a complete PR fiasco for Uber. And even though the company is often accused of malfeasances for which they’re not directly responsible, these numerous and public gaffes represent blood in the water, making the company rife for criticism and attack from its competition.

Lessons learned

Focal Media Group’s lesson from this? Pay attention to what people are saying about you in real-time. Pay closer attention to both the quality of your product and how you can keep it as high as possible and the user experience. If you have an amazing product and a friendly, inviting user experience with an easy-to-use interface, you likely won’t have to worry about many of the problems we see Uber experiencing now.

Of course, Focal Media Group and their StyleShoots machine is only one pertinent example out of thousands of startups seeking with gusto to break into their respective industries and disrupt them. But if you’re a company on the verge of disrupting a major industry, you would do well to observe your more successful and noteworthy predecessors, to mark both their successes and their failures, and to learn from both these notions to better your own company and more effectively facilitate the disruption you seek to implement.

An abstract graphic consisting of a dense network of thin, light-gray lines connecting small, dark-gray circular nodes. The nodes and lines are concentrated on the right side of the image, creating a complex, web-like structure that resembles a molecular model or a data network. The background is a solid dark gray.

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