

DEC 31, 2016

# TechLife

## NEWS

**2016 IN  
REVIEW**  
TECHNOLOGY  
BREAKTHROUGHS

# 2017

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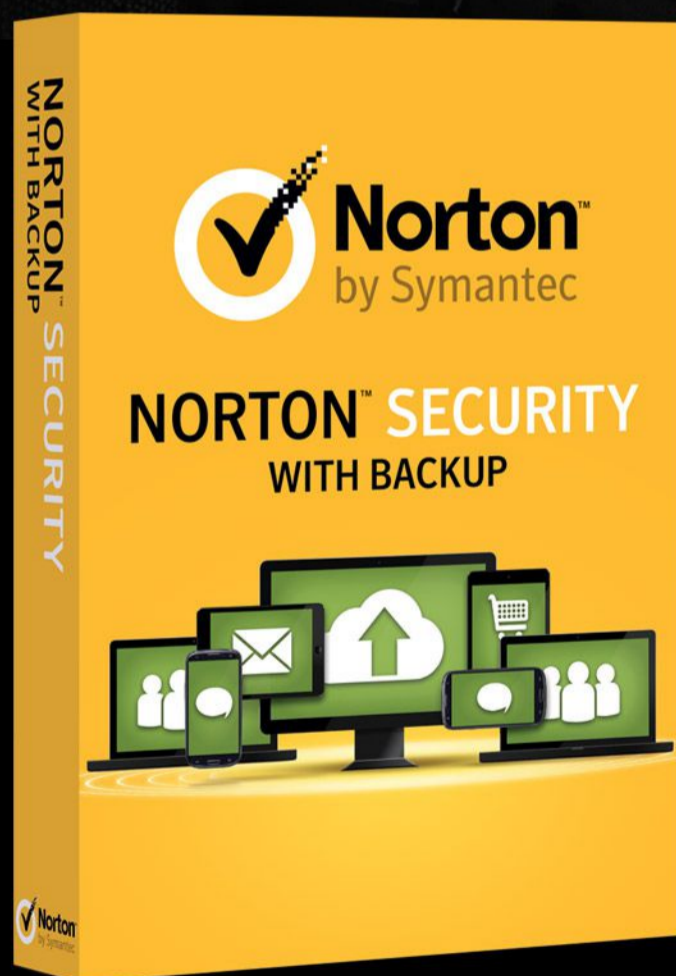
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# SUMMARY

*Q&A: THE DATA YOUR CAR COLLECTS AND WHO CAN USE IT 06*

*SCIENCE : HOW DO YOU GET ONE? 5 THINGS TO KNOW ABOUT THE NOBEL PRIZES 14*

*HEALTH: DRONES CARRYING MEDICINES, BLOOD FACE TOP CHALLENGE: AFRICA 22*

*INSIDER Q&A: WHAT'S HARD ABOUT STREAMING TV ONLINE 32*

*PLAYSTATION VR: THE FUTURE HAS FINALLY ARRIVED 38*

*WHY IT MATTERS: ENERGY 52*

*THE GREAT WAR? 'BATTLEFIELD' PLOTS TO MAKE WWI ENTERTAINING 58*

*WITH EMAIL DUMPS, WIKILEAKS TESTS POWER OF FULL TRANSPARENCY 68*

*SCIENCE - Q&A: FISH AND POLITICS BEHIND ANTARCTIC MARINE RESERVE DEAL 76*

*TRUMP IS MASTER OF HIS DOMAINS, EVEN ONES THAT BASH HIM 82*

*CHINA SAYS NEW ROCKET BRINGS SPACE STATION PLANS CLOSER 90*

*THE EVOLUTION OF AMY ADAMS ON VIEW IN 'ARRIVAL,' 'NOCTURNAL' 96*

*CARRIE FISHER REVEALS 'STAR WARS' AFFAIR WITH HARRISON FORD 104*

*FACEBOOK'S FAKE NEWS PROBLEM: WHAT'S ITS RESPONSIBILITY? 106*

*GOOGLE RELEASES APP TO DIGITIZE BOXES OF OLD PHOTO PRINTS 114*

*LYFT LIFTS OFF WITH NEW LOOK, LIGHT-UP BEACONS 118*

*MONEY, MONEY, MONEY: MANAGING IT ON iOS 122*

*TOADSTOOL FOOTSTOOLS ARE ORGANISMS MANUFACTURING'S FUTURE 136*

*GET READY TO BUILD! HANDS-ON TOYS THAT TEACH ARE HOT 144*

*WHY FINGERS MAKE HANDY, IF NOT FOOLPROOF, DIGITAL KEYS 152*

*HOW A TRUMP ADMINISTRATION COULD SHAPE THE INTERNET 162*

*SCIENTISTS DEVELOP ROBOTIC HAND FOR PEOPLE WITH QUADRIPLEGIA 172*

*STREAMING SPORTS GETS EASIER AS NFL COMES TO CBS ALL ACCESS 176*

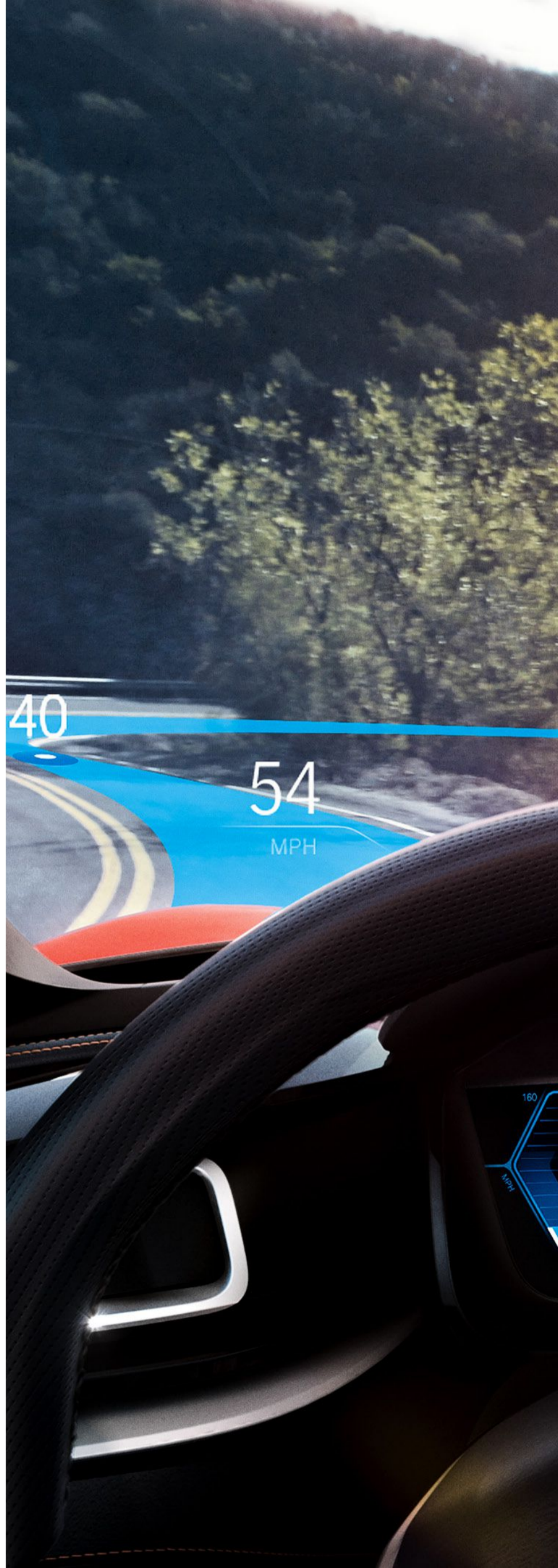
# Q&A: THE DATA YOUR CAR COLLECTS AND WHO CAN USE IT

Your car knows more about you than you think.

Newer cars that connect to the internet can collect vast amounts of data about drivers, such as where you went to dinner, if you broke the speed limit or if your seat belt was buckled.

When you buy a car, you cede data control to your car company. Most automakers say they won't sell information without an owner's consent. But they're not legally required to inform you if they do.

Car data is about to become big business. A new report from consulting firm McKinsey says automotive data could be worth \$450 billion to \$750 billion globally by 2030. Automakers, insurers, high-tech firms, city planners and





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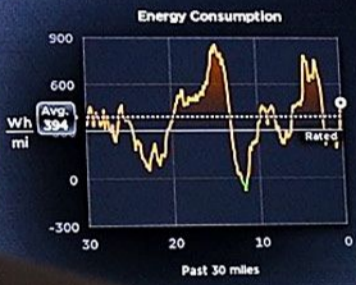
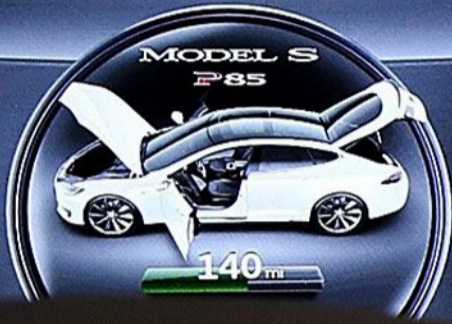
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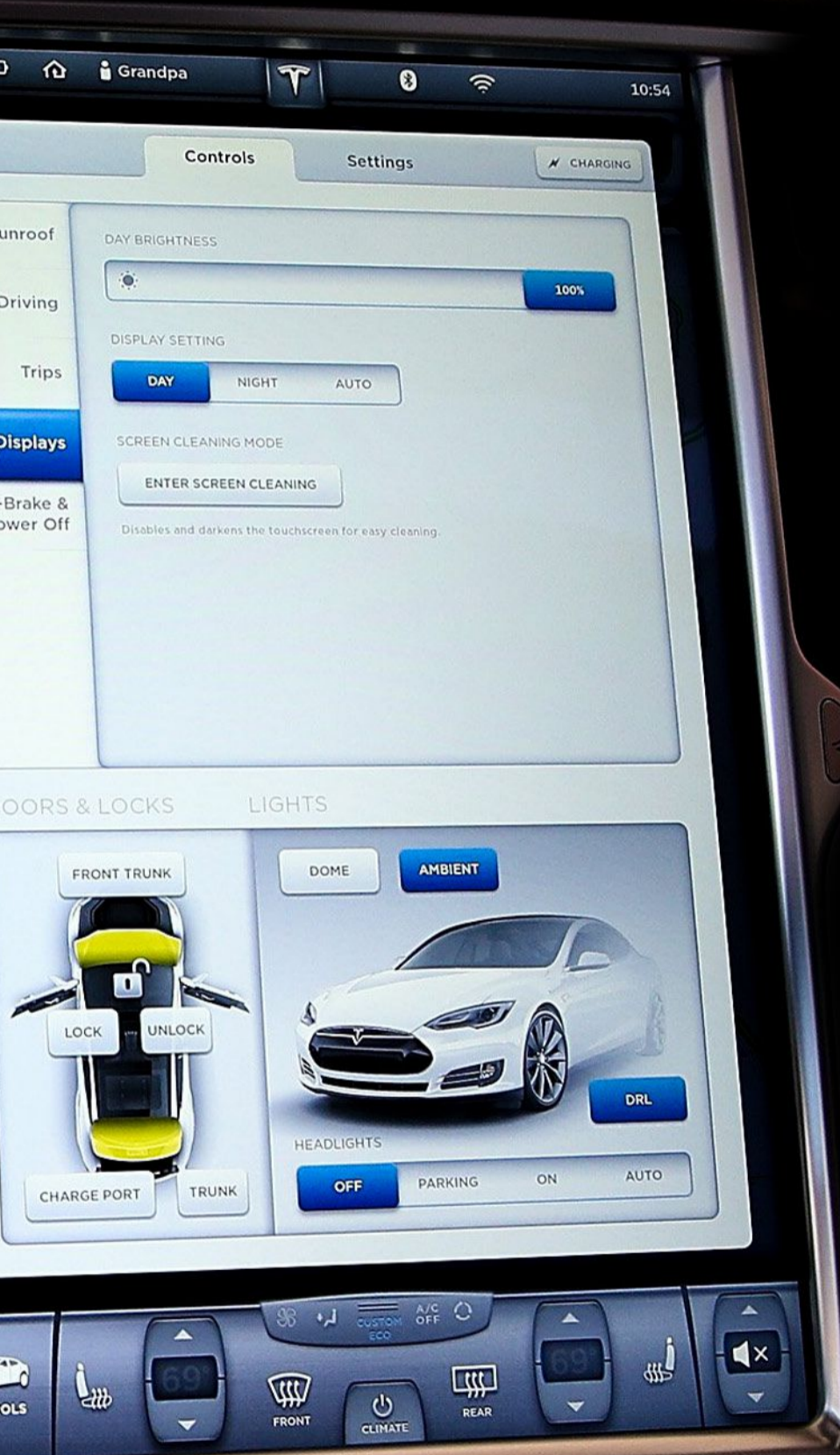
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advertisers are among those who could use data to refine services. Drivers could share data in exchange for navigation systems, or they could pay extra for perks like a parking spot finder.

Here's a primer on the emerging issue of connected-car data:

Q: Which cars collect data?

A: Just under 20 percent of new cars sold globally now can be linked to the internet, according to BI Intelligence. That figure is expected to reach 75 percent by 2020.

For example, General Motors Co. will have 12 million connected vehicles by the end of this year worldwide, which it says is the most for any automaker.

Q: Do I own data that's collected?

A: That's unclear. Under federal law, drivers own data stored in event data recorders, or "black boxes," which monitor vehicles in a crash. Police and insurers need a driver's consent - or a court order - to get that data. But there are no laws addressing data collected by automakers through vehicle internet connections.

Q: How do automakers use the data?

A: It depends on the vehicle and the manufacturer. Some turn data into notifications. Cars can automatically signal for help if an air bag deploys, for example. Some will send a message if oil needs to be changed or a vehicle is being recalled.

Tesla Motors has used data to reveal - sometimes within hours of a crash - how fast the driver was going and whether or not the company's semi-autonomous Autopilot system was engaged.





Q: Can automakers sell data without my knowledge?

A: They could, depending on language in owners' manuals. But under voluntary principles established by the Alliance of Automobile Manufacturers in 2014, most agreed to get permission before sharing anything about a driver's location, health or behavior with third parties.

Twenty companies - including GM, Toyota, Ford, Hyundai and Mercedes-Benz - signed that agreement, which is effective by the 2017 model year.

The policy doesn't require consent for automakers to share data with emergency workers or to share it internally for research.

Q: Can I stop an automaker from collecting my data?

A: Most automakers let owners opt out, but that's usually buried in fine print, says Khaliah Barnes, former associate director of the nonprofit Electronic Privacy Information Center, who now works on privacy issues for the federal government.

Under the 2014 agreement, automakers committed to providing clear notices about data, the reasons for collecting it and where it can be shared. But that's not always happening. For example, some GM owners' manuals tell people about data storage, but they must track down separate policies to learn more, Barnes says.

Q: Are there benefits to sharing data?

A: Yes. Upon a driver's request, GM will send driving data to insurance companies like Progressive and State Farm to see if the driver





qualifies for lower rates. OnStar will send coupons to your phone for businesses along your route.

Tesla collects data in order to improve cars via software updates.

There is evidence people aren't fretting about data sharing. McKinsey found 79 percent of the 3,000 customers it interviewed in the U.S., China and Germany were willing to share. More than 70 percent were willing to pay for data-enabled services that would save time, like a parking spot finder.

Q: What's the downside to sharing data?

A: Insurance companies could require drivers to let them monitor driving before they grant a policy. They could see if you go fast around curves, accelerate too quickly or if you don't wear a seat belt. That could raise rates. You could also get overwhelmed with unwanted coupons.

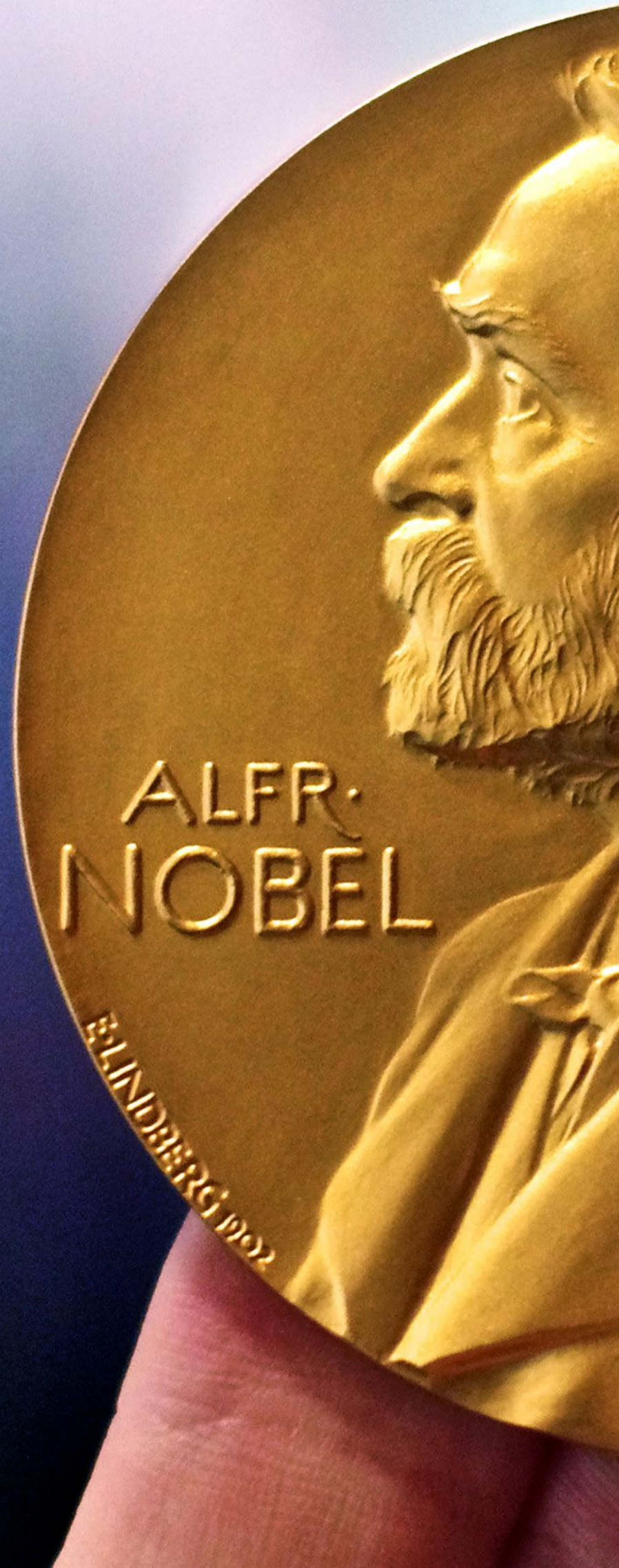
Q: What's the future of car data sharing?

Mark Thomas, head of connected car marketing for Cisco-Jasper, predicts automakers will eventually go from charging monthly internet fees to monetizing the service other ways, perhaps by selling data. Internet costs could be split, with part going to an insurer, music provider or other data user. Without a monthly charge, more drivers would sign up, he says.

Currently, data charges can be steep. New GM vehicles come with a free OnStar Guidance Plan trial. It automatically calls emergency services after a crash, tracks and slows down a car if it's stolen and provides hands-free calling. But it costs \$34.99 per month when the trial is over.

# SCIENCE

HOW DO YOU  
GET ONE?  
5 THINGS  
TO KNOW  
ABOUT  
THE NOBEL  
PRIZES





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Actors yearn for Oscars, athletes crave Olympic gold - but for scientists, writers and champions of world peace, there's no bigger honor than a Nobel Prize.

The Nobel judges will announce the winners of the 2016 awards beginning this week, one prize a day, starting with medicine on Monday. Here are five things to know about the prestigious prizes, created by 19th-century Swedish industrialist Alfred Nobel.

### **WHAT'S THE BIG DEAL?**

The prestige of the Nobel Prizes comes down to history and cash, says Gustav Kallstrand, curator of the Nobel Museum in Stockholm.

Each award is currently worth 8 million Swedish kronor - about \$930,000, making the Nobel Prizes among the world's most lucrative awards. Kallstrand says when they were first handed out in 1901, the prize money equaled about 20 years of a professor's salary.

Today the money is secondary, he said. For many, the biggest reward is joining the likes of Albert Einstein, Marie Curie, Martin Luther King Jr., and Ernest Hemingway in the pantheon of Nobel laureates.

### **WHY THE HUSH-HUSH?**

Ask Nobel judges about the front-runners for this year's awards and they will clam up as if they're protecting secret nuclear codes.

The Nobel statutes prohibit them from discussing any nominations - besides the winners - for half a century.

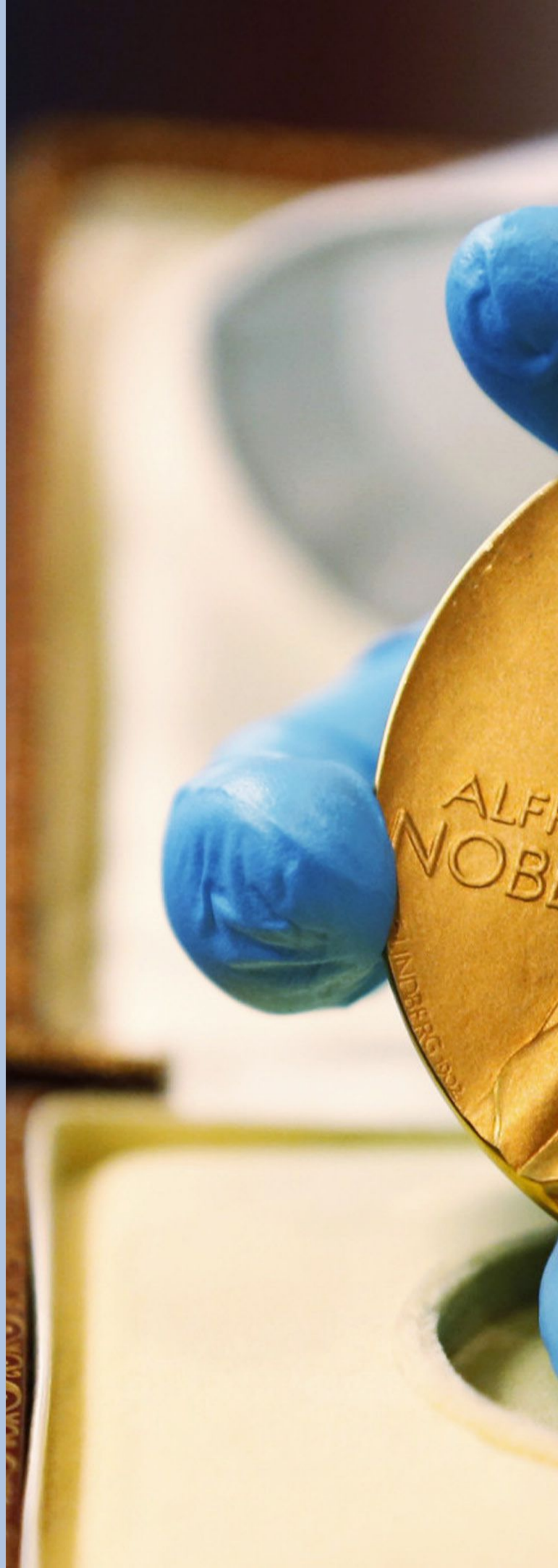








Image: Alexander Mahmoud



Kallstrand says there are two reasons for this secrecy. One is that judges want to spare those who were nominated, but didn't win, the stress of feeling like they lost. "The Nobel Prize isn't a competition in that sense," he says.

The other reason is to safeguard the independence of the Nobel judges. In the early days of the prize, Kallstrand says, the world scientific community was quite small, so the judges often knew the nominees and those who nominated them. By keeping the deliberations secret, judges could feel free to speak candidly about the candidates.

### WHO ARE THE JUDGES?

In his 1895 will, Nobel specified which institutions should select the winners.

For the medicine award, he gave the task to Stockholm's Karolinska Institute. The Royal Swedish Academy of sciences got the physics and chemistry awards and the Swedish Academy, which is a different body, got the literature prize.

In a decision lamented by many a Swede, he gave the peace prize - the most high-profile trophy of them all - to a panel selected by the Parliament of neighboring Norway.

Nobel never explained his reasoning, but Norway and Sweden were joined in a union at the time. Also, Norway was a small, peaceful country on Europe's periphery. Perhaps Nobel felt it was more suitable for a peace prize than Sweden, which had a history of military aggression against its neighbors, and coerced Norway into a union after losing control of Finland to Russia.



Image: Alex Ljungdahl



## IS THE ECONOMICS AWARD A NOBEL PRIZE?

Strictly speaking, no. Nobel didn't mention a prize for economics in his will. It was created in 1968 in his memory by the Riksbank, the central bank of Sweden.

Still, the economics award is handed out with the others, with the same pomp and fanfare, at the annual award ceremony on Dec. 10, the anniversary of Nobel's death in 1896.

But the Nobel Foundation, which administers the awards, still won't call it a Nobel Prize. Officially it's called the Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel.

## HOW DO YOU WIN A NOBEL PRIZE?

Laureates often get asked this question, and their standard reply is "work hard and follow your passion."

It helps, of course, to make a groundbreaking discovery like X-rays or penicillin.

In the science categories, winners often have to wait decades before the Nobel judges feel confident their discovery has withstood the test of time.

It's different for the peace prize, which is often intended as a shot in the arm to someone in the midst of a struggle for peace or democracy. That explains why some peace prizes, in hindsight, can seem a bit premature - like the 1994 award for a Middle East peace agreement that is now in tatters.



Health





DRONES  
CARRYING  
MEDICINES,  
BLOOD  
FACE TOP  
CHALLENGE:  
AFRICA







At first, the drone took some explaining. Anxious villagers buzzed with rumors of a new blood-sucking thing that would fly above their homes. Witchcraft, some said.

The truth was more practical: A United Nations project would explore whether a small unmanned aerial vehicle, or UAV, could deliver HIV test samples more efficiently than land transport in rural Malawi.

Once understanding dawned and work began, young students and their teachers would spill out of the nearby school, cheering, each time they heard the drone approaching. "It was very exciting," UNICEF official Judith Sherman said.

As drones quickly pick up momentum around the world in everything from military strikes to pizza delivery, Africa, the continent with some of the most entrenched humanitarian crises, hopes the technology will bring progress.

This second-largest continent, with harsh landscapes of desert and rain forest and extremes of rainy seasons and drought, is burdened with what the World Bank has called "the worst infrastructure endowment of any developing region today." Rural highways, often unpaved, disintegrate. In many countries, access to electricity has actually declined. Taking to the air to soar over such challenges, much as Africa embraced mobile phones to bypass often dismal landline service, is a tempting goal.

Those trying out drones for humanitarian uses in Africa warn that the technology is no quick fix, but several new projects are exploring what can be achieved.

The highest-profile one yet begins this week in Rwanda, as the government and U.S. company Zipline launch a drone network to deliver blood supplies and medicines to remote hospitals and clinics. Even in one of Africa's smallest countries, such deliveries can take weeks by land. With drones, it will take hours.

The speed and limited space of drones have focused aid groups and businesses on how to deliver small, sensitive and potentially life-saving cargo. Earlier this year, a partnership was announced between Zipline and the Global Alliance for Vaccines and Immunization.

Off Africa's eastern coast in Madagascar, another U.S. company, Vayu, has completed drone flights to deliver blood and stool samples from rural villages with support from the U.S. Agency for International Development.

Africa has certain benefits for such projects, said Sid Rupani, who from his South Africa office studies how drones could be used effectively in supply chains. His U.S.-based employer, Llamasoft, has run a virtual pilot for Zipline in Tanzania.

"It's not crowded airspace. Not many urban areas to deal with," Rupani said. Already, drones are being used in parts of the continent as visual aids in mapping and anti-poaching.

Drones also face multiple challenges. Some models are limited in range or need frequent recharging. If they crash, retrieval in remote areas can be difficult. Some governments are wary of the technology as a possible invasion of their sovereignty, or they have no regulations in place.





Even aid workers have reservations. In a survey of workers in 61 countries released last month by the Humanitarian UAV Network and other groups, the majority saw drones as positive, but 22 percent did not.

A top concern was that people on the ground would think they were under attack.

“Whether we like it or not, UAVs are confused with weaponized drones,” one Congo aid worker told the survey, pointing out the use of drones by the U.N. peacekeeping mission there.

Cost is another issue. The United Nations’ test early this year in Malawi with the help of U.S. company Matternet found that using motorcycles was cheaper as they could carry other cargo, said Sherman, UNICEF’s HIV and AIDS chief there.





But she still sees drones as “a leapfrog technology that has great potential, some we might not have thought of yet.”

Aid organizations are pushing for new breakthroughs. The Netherlands-based Wings for Aid is working on a drone prototype to carry more and go farther: Up to 100 kilograms (220 pounds) of cargo could be delivered to several points within 500 kilometers (310 miles), said Wesley Kreft, director of business development and innovation.

“The holy grail is to have a network of autonomous drones that do their work independently, with a human supervising numerous deliveries at once,” said Arthur Holland Michel, co-director of the Center for the Study of the Drone at Bard College in New York.

It could take a couple of years before such drones could be entrusted with critical deliveries in challenging rural areas like Africa, he said, but the technology is there.

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# INSIDER Q&A: WHAT'S HARD ABOUT STREAMING TV ONLINE

As more people watch TV over the internet, the entertainment industry has “to get on board with it,” said Roger Lynch, the CEO of Sling TV.

Sling, which is owned by satellite TV company Dish Network, was one of the first services to offer packages of popular cable channels over the internet, threatening cable’s dominance. Prices start at \$20 a month for a core group of channels including ESPN and AMC; packages with other channels cost extra. By comparison, the average cable bill is \$100, according to research from Leichtman Research Group.

Even as fewer households pay for traditional TV services, new internet-TV options could help major TV networks add back some lost subscribers. DirecTV is expected to launch a service this year and Hulu has one coming in 2017.





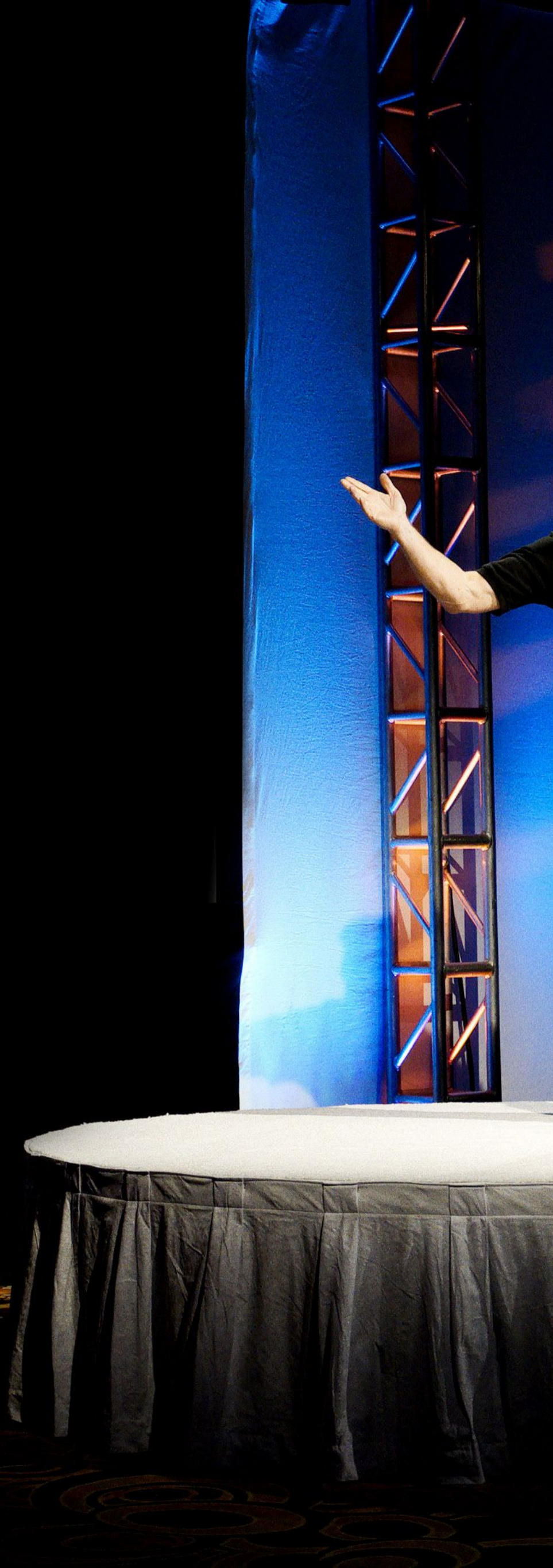
In an interview with The Associated Press, Lynch talks about how streaming TV is going mainstream and why he couldn't do "a la carte" TV - paying only for the channels you actually watch. Questions and responses have been edited for clarity and length.

Q: How has the market changed since Sling launched in February 2015?

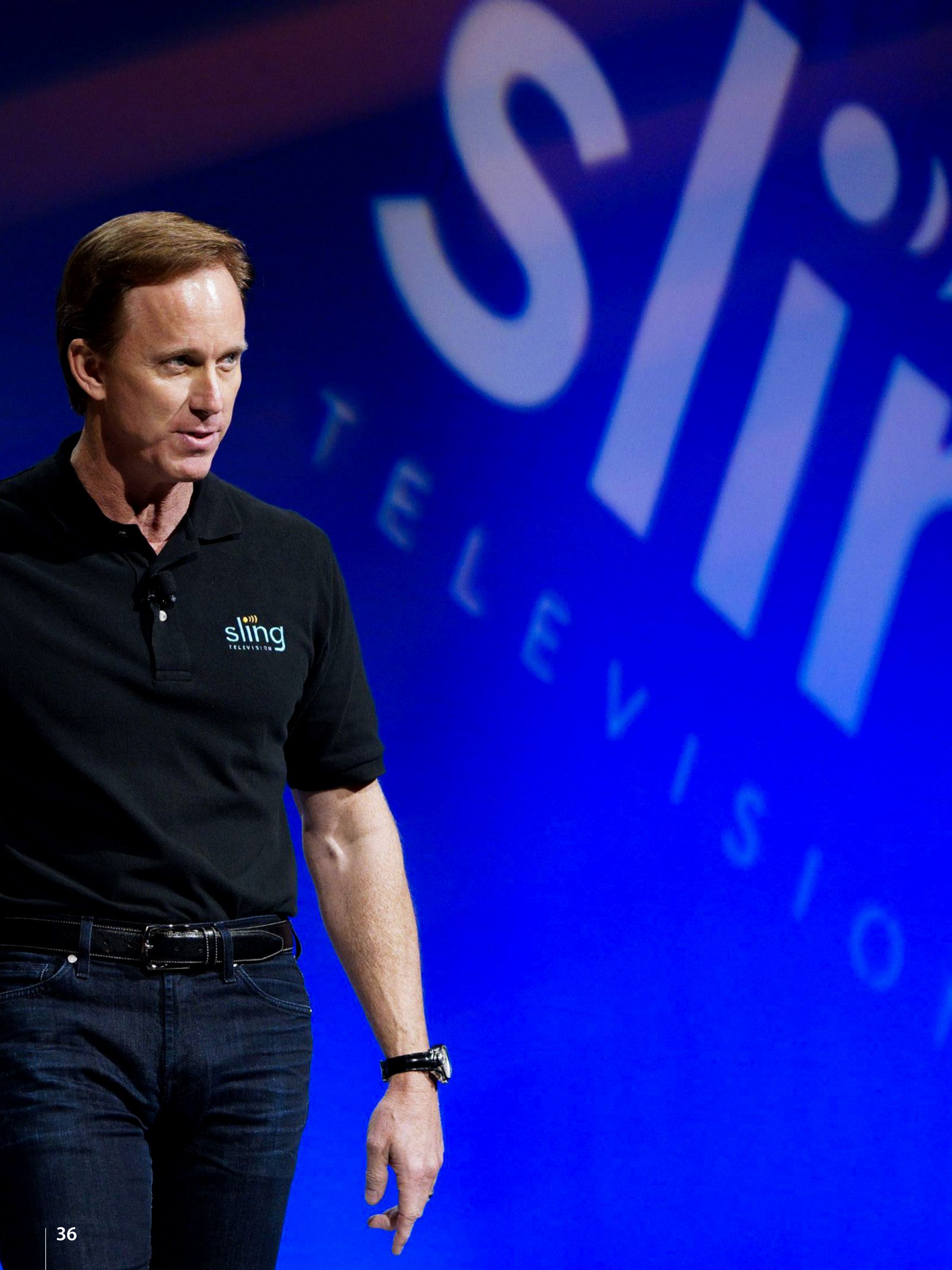
A: There are about 21 million homes without pay TV. Of those, 16 million are cord-nevers (people who have never signed up) and 5 million are cord-cutters. We were focused on those markets. What we've seen since then is a dramatic shift. Consumers are leaving traditional pay TV at much higher rates. We see that shift as a large opportunity for us.

Q: Are TV channel companies like NBCUniversal, Disney and Fox looking at you differently?

A: When we first started talking to programmers, there was skepticism. There was concern about whether it would cause cord-cutting. What's happened since then, they've accepted it's really the future of pay TV. Consumer behavior is changing.







Q: Why can't you let viewers choose just the channels they want - an "a la carte" model - rather than creating a system of mini-bundles and add-ons?

A: That would be ideal. But that doesn't work for programmers. That undermines their business model. Truly a la carte wouldn't be enough revenue for programmers. It is a bit of a compromise.

Q: Can you do more to let people pick their own channels?

A: I don't think there's a whole lot more. We've created extremely flexible options within the bounds of what I know is achievable, given the structure of the industry. Gee, wouldn't it be nice if I can just sell individual channels? I know the economics won't work so there's no point in trying to push for that.

Q: Do you face increasing competition from channels like HBO and CBS coming out with their own services?

A: Our objective has never been to be the entire video service. We want to be a piece of that puzzle. They might take us with an antenna or Netflix. That's fine.

Q: Do consumers watch on TV or outside the house?

A: Over 40 percent of our customers watch on mobile phones. Previously we know that most of that was being watched on Wi-Fi networks.

Q: Is that changing with more phone companies promoting unlimited-data plans?

A: I expect what we'll see is an increase in mobile viewing overall.





# PLAYSTATION VR: THE FUTURE HAS FINALLY ARRIVED

SONY SHOWS THAT VR  
IS HERE TO STAY







## THE DEVICE THAT WE HAVE ALL BEEN WAITING FOR

It seems that virtual reality has been spoken about in hushed terms for years, with such questions as “What will it look like?,” “What will we be able to do with it?” and “How much will it cost?” having been frequently asked. Well, 2016 has been the year in which we have had firm answers to many of these questions, with VR having finally taken off in a big way in the US market.

The Oculus Rift and the HTC Vive have both landed on the market, **but many critics are already tipping Sony’s effort, the PlayStation VR, to be the device that truly pushes the market forward.** It’s a lot cheaper than the models mentioned above and crucially, it’s compatible with the PlayStation 4. At the start of the year, **there were over 35.9 million of these consoles sold worldwide,** so there’s a huge consumer base for the newly released device to target.

Sony’s effort being a lot cheaper than the other two models indicates less impressive specifications. However, steps have been taken to make the PSVR headset stand out in the market. It comes with added comfort features and a high frame rate that helps to reduce motion sickness. It’s not the very highest-end product in the market, but it is also by no means a run-of-the-mill unit. It’s a great middle ground, which could make it the product that we have spent years waiting for.





## SONY'S EFFORT WILL NOT BREAK THE BANK

One of the great things about the PlayStation VR is that, if you're already a PS4 owner, you're already well on your way to a truly immersive gaming experience. The system is compatible with every version of the PS4, and you'll just need to purchase a PlayStation camera to get going. If you already have this hardware available, **the PlayStation VR will only cost you around \$399.**

The fact that so many people in the US already own a PS4 console could make this piece of software especially attractive to those on a budget or who are new to VR gaming, because there isn't the need to shell out for a high-spec PC, as is the case with the Rift and the Vive. In fact, the Rift will set you back \$599, and you could find yourself paying well above \$750 for the Vive. The accessibility that Sony's effort boasts, along with its affordability, are the main reasons why this product is expected to make waves in the mainstream market.

## IT'S AVAILABLE IN DIFFERENT BUNDLES

Even if you don't have all of the components required to enjoy VR gaming from the off, Sony has you covered thanks to its comprehensive bundles. There are two packages for you to choose from. You can get the VR package, which comes with all of the correct cables, the VR headset and a headphone. However, to get the most comprehensive VR experience, you will need motion sticks, too.

If, however, you only have the console and none of the accessories to go with it, it's

highly recommended that you pick up the Launch bundle. This bundle includes the VR system, PlayStation camera, two Move Motion controllers and a copy of VR Worlds. Although the latter package is slightly more expensive, coming in at just a touch under \$500, it's well worth the money because it gives you the most immersive VR experience straight away.

What's more, **both packages come with around a dozen titles pre-installed.** When you consider just how much you're getting, Sony's offering is exceptional value for money.

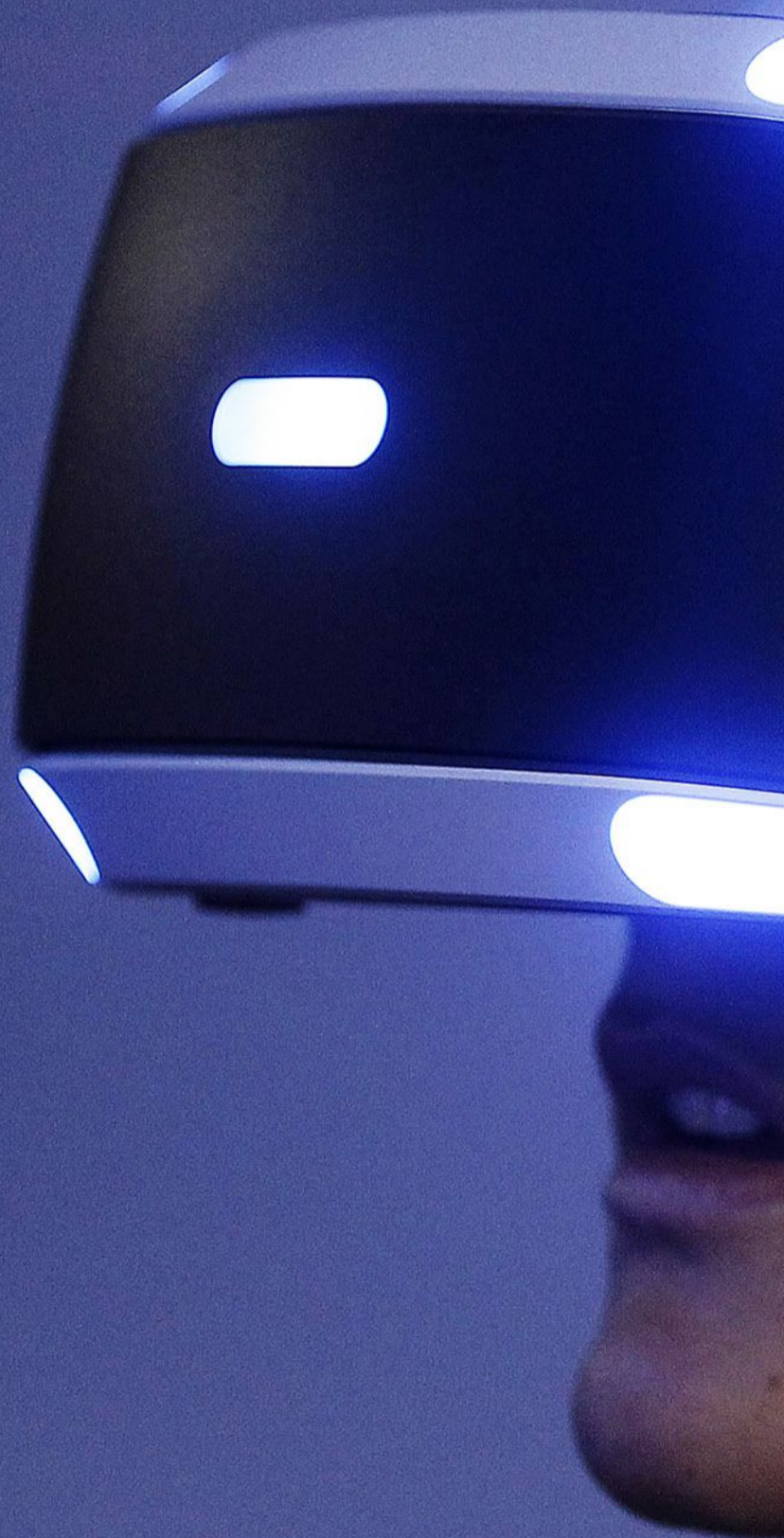
## A DISPLAY WITHOUT THE NOTORIOUS 'SCREEN-DOOR' EFFECT

As you'd expect from a product in a low-medium price range, the graphics on the PSVR are not quite as sharp when compared to pricier models like the Rift and the Vive.

While **the Rift, for example, comes with two displays and boasts a 2160 x 1200 screen resolution, Sony's offering comes in some way behind at 1920 x 1080.**

You might think that the PSVR's lower resolution would cause a screen-door effect - the issue where a series of black lines appear on your headset that act as a separation between pixels. After all, the screen-door effect could strip the authenticity away from your VR experience. However, **Sony has come up with a clever technique that eliminates the screen-door effect**, which more than makes up for the lower screen resolution.

Inside each pixel on the PSVR, there are three subpixels: one for green, one for red and one for blue. When you combine these subpixels with









the relatively clear screen resolution, it turns out that Sony's offering has over a million more pixels than the Rift - eliminating the screen-door issue and providing that immersive, authentic experience that so many gamers crave. It just goes to show that you don't need to shell out a fortune to obtain better graphics.

## ADDITIONAL COMFORT FOR HOURS OF USE

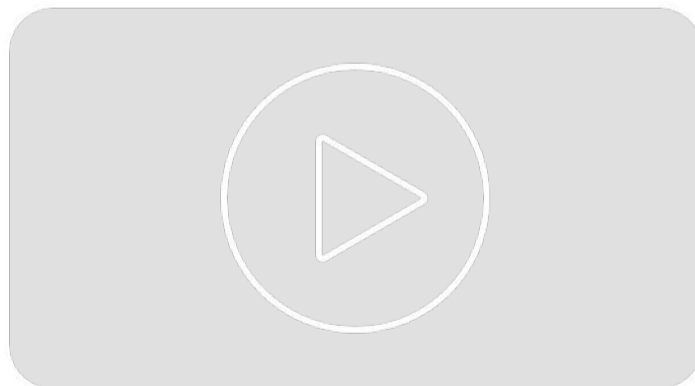
Although the PSVR might be slightly lacking in top-class technology and breathtaking specs, perhaps one of the areas in which it excels is usability. Unlike the Vive and the Rift, the PSVR comes with a wraparound, padded headset - allowing the screen to dangle off the end of it and slide onto your face when required. It also comes with a button that allows you to move the screen closer to or further from your eyes, depending on your personal preferences. This entire movement can be carried out without moving the piece of kit from your face, so you won't have to stop playing when you need to make an adjustment.

What's more, Sony has paid serious attention to detail to the elimination of blackout. Obviously, the screen covers 100% of your eyes, but rubber has been included around the nose to prevent the light from entering through other areas.

**However, just be aware that these rubber features cannot be removed**, so it can get quite hot when wearing this piece of kit.







*PlayStation VR Review*



# RESIDENT

biohazard



## A RAPIDLY INCREASING NUMBER OF GAMES

You might imagine that the PSVR would fall way short in terms of games offered when compared to its console counterpart. While this may be the case for now, the number of games on the platform is expected to rise. **No fewer than 31 games are being released with the kit at launch**, including Batman: Arkham VR and EVE: Gunjack. 25 more games are set to be released shortly afterwards, and games like Resident Evil 7: Biohazard and Golem are expected to become available in the early stages of 2017.

Although you may have to wait for some of the bigger titles to come onto the headset, you will still have a huge range of options to throw yourself into. In fact, the earlier games, including Job Simulator and 100ft Robot Golf, will show you just what this technology is capable of and how it will change your gaming experience forever.

There seems to be a lot of hype surrounding this headset, and it appears that it could change the face of gaming here in the U.S. However, while it is certainly a lot more affordable than other models on the market, we won't know how good it is until it hits the shops. One thing that certainly is for sure, however, is that VR is here to stay, with Sony looking likely to be one of the major players in this fast-emerging sector for many years to come.

by Benjamin Kerry & Gavin Lenaghan

# WHY IT MATTERS: ENERGY

**THE ISSUE:** Energy independence has been a goal of every president since Richard Nixon. Hillary Clinton and Donald Trump have very different ways to achieve it. How energy is produced and where it comes from affect jobs, the economy and the environment.

## WHERE THEY STAND

Clinton pledges that under her leadership, the U.S. will be able to generate enough renewable energy to power every home in America within 10 years, with 500 million solar panels installed by the end of her first term. She also vows to reduce U.S. oil consumption by one-third through cleaner fuels such as biodiesel and natural gas and more fuel-efficient cars, boilers, ships and trucks. Clinton generally supports oil and gas drilling on federal lands, but would bar drilling in the Arctic and Atlantic oceans.





After running as a champion of coal in 2008, Clinton now calls for protecting health benefits for coal miners and their families and helping retrain them for new jobs. She offers cautious support for nuclear power.

Trump vows to “unleash American energy,” allowing unfettered production of oil, coal, natural gas and other sources to push the U.S. toward energy independence and create jobs. Trump would sharply increase oil and gas drilling on federal lands and vows to revive the struggling U.S. coal industry. He also would open up offshore drilling in the Atlantic Ocean and other areas where it is blocked.

Trump calls for rescinding the Clean Power Plan, a key element of President Barack Obama’s strategy to fight climate change, as well as a rule to protect small streams and wetlands from development. He also would cancel the 2015 Paris climate agreement and stop U.S. money going to U.N. global warming programs.

## WHY IT MATTERS

Although energy independence remains elusive, increases in U.S. oil production have lowered reliance on imports. In 2015, the U.S. relied on net imports for about 24 percent of petroleum use, the lowest level since 1970.

Domestic production of all types of energy except coal has boomed in recent years, spurred by improved drilling techniques and discoveries of vast oil supplies in North Dakota and natural gas in states such as Pennsylvania, Ohio, New York and West Virginia. Production also is up in traditional energy states such as Texas, Oklahoma and Louisiana.





Prices at the gasoline pump have declined sharply, to an average of \$2.21 per gallon for regular unleaded in September, according to the AAA auto club. That's down from \$3.60 per gallon in 2012.

Natural gas, cleaner than coal, has been embraced by politicians from both parties, including Clinton and Trump. Still, critics worry that popular gas drilling techniques such as hydraulic fracturing - or fracking - and horizontal drilling could be harming air, water and health.

Clinton has said fracking should not take place where states and local communities oppose it, and she pledges to reduce methane emissions from all oil and gas production and protect local water supplies. On climate change, she vows to meet Obama's goal to reduce greenhouse gas emissions by up to 30 percent by 2025.

Trump says restrictions supported by Clinton would hurt energy-producing states such as Colorado, Pennsylvania, North Carolina and Virginia - battleground states in the election. While arguing that tax credits and other subsidies for wind and solar power "distort" the market, Trump says the U.S. should "encourage all facets of the energy industry."

Wind and solar power have grown in recent years, thanks in part to support from Obama, but renewable energy sources accounted for just 10 percent of total U.S. energy consumption in 2015. Renewable energy is generally more expensive to produce and use than fossil fuels. Clouds impair solar energy and calm skies slow wind farms.












# THE GREAT WAR? 'BATTLEFIELD' PLOTS TO MAKE WWI ENTERTAINING

How do you make a video game about World War I fun?

After nearly 15 years of creating shoot-'em-up games about World War II, the Vietnam War and fictionalized contemporary and futuristic military conflicts, the creators of the "Battlefield" series are going back - way back - with their latest installment. Uncharacteristically, the new "Battlefield" is set amid a century-old war rarely depicted in the interactive medium.

A close-up, low-angle shot of a hand holding a World War I-era trench gun. The hand is wearing a brown leather glove. The gun is a complex, multi-barreled weapon with a long barrel and a large magazine. The background is a bright, snowy landscape with a few bare, dark trees silhouetted against the sky. The overall tone is somber and historical.

“In the beginning, we had many preconceptions, such as there were only single-bolt rifles and the action was primarily in the trenches,” said Lars Gustavsson, design director at Stockholm, Sweden-based studio DICE. “As we dug deeper, we realized the Great War was really the dawn of all-out warfare and paved the way for everything we’ve done in the past.”

For the interactive industry, it’s already a challenge to realistically and thoughtfully construct virtual wars based on real ones, but WWI has always been the ultimate tonal challenge. With its gruesome reputation and political complexities, it’s typically a no-fly zone for mainstream game developers who rely on easy-to-understand, good-versus-evil narratives.



The bold departure for the series is right there in the latest edition's title: "Battlefield 1" - not "Battlefield 5," as it would've traditionally been called. In the game, out Friday, players won't only engage in ground skirmishes and dogfights across the Western Front, they'll also do battle in the Great War's lesser-known theatres, such as Arabia and the Italian Alps.

The series' shift back to the early 20th century, when the tools of modern warfare were first emerging, has fundamentally changed the military shooter's gameplay. For example, tech-savvy players can't rely on missile guidance systems, fly drones into enemy territory or employ other military gizmos to take down combatants. It's made for a grittier, more grounded game.

Gustavsson noted the throwback approach has also allowed game makers to explore the chaotic war's cultural diversity, whether it's showcasing Indian soldiers fighting alongside British troops in the multiplayer mode or creating downloadable content about the 369th infantry regiment, the predominantly African-American military unit known as the "Harlem Hellfighters."

"For the campaign, we didn't just want to focus on one soldier who was capable of everything, so we've taken this war story approach that presents many different perspectives from several different sides of the war," said Gustavsson. "We've tried to paint as broad a picture as possible on the battlefields, where troops fought and destinies were changed."

While the developers strived for accuracy in recreating the era's locales, vehicles, weapons and other gear, "Battlefield 1" isn't a true















historical simulation. The game's multiplayer mode, where players will spend most of their time, allows wannabe soldiers to pull off such outlandish feats as taking on tanks on horseback and reigning down on troops from airships.

"It's a game," said Patrick Soderlund, executive vice president at "Battlefield" publisher Electronic Arts Worldwide Studios. "It's still meant to be fun. We've obviously gamified some of the equipment to make for a better experience. If it was completely authentic, the guns would jam a lot more on the battlefield. That wouldn't make for a very enjoyable experience."

It also means players can't die of the Spanish flu. The pandemic isn't in the game.

This year's change of scenery has already distinctly differentiated "Battlefield" from that other big military shooter in the marketplace. Activision's "Call of Duty," which remains gaming's most successful military shooter franchise, will push further into the space age on Nov. 4 with "Call of Duty: Infinite Warfare." Soderlund is optimistic about EA and DICE's unique turn.

"It took some convincing, but I think we have a better, far more groundbreaking product than if we would've just did the expected thing and made another modern-day military shooter," said Soderlund. "This game has really galvanized the company in a way that I didn't anticipate, to be honest. I think everyone here is really excited about it and wants to play it."

Online:

<https://www.battlefield.com>



# WITH EMAIL DUMPS, WIKILEAKS TESTS POWER OF FULL TRANSPARENCY



WikiLeaks founder Julian Assange first outlined the hypothesis nearly a decade ago: Can total transparency defeat an entrenched group of insiders?

“Consider what would happen,” Assange wrote in 2006, if one of America’s two major parties had their emails, faxes, campaign briefings, internal polls and donor data all exposed to public scrutiny.

“They would immediately fall into an organizational stupor,” he predicted, “and lose to the other.”

A decade later, various organs of the Democratic Party have been hacked; several staffers have resigned and Democratic presidential candidate

Hillary Clinton has seen the inner workings of her campaign exposed to the public, including disclosures calling into question her positions on trade and Wall Street and her relationship with the party's left. Many of these emails have been released into the public domain by WikiLeaks.

Some see the leaks as a sign that Assange has thrown his lot in with Republican rival Donald Trump or even with Russia. But others who've followed Assange over the years say he's less interested in who wins high office than in exposing - and wearing down - the gears of political power that grind away behind the scenes.

"He tends not to think about people, he thinks about systems," said Finn Brunton, an assistant professor at New York University who has tracked WikiLeaks for years. "What he wants to do is interfere with the machinery of government regardless of who is in charge."

WikiLeaks' mission was foreshadowed 10 years ago in "Conspiracy as Governance," a six-page essay Assange posted to his now-defunct blog.

In the essay, Assange described authoritarian governments, corporations, terrorist organizations and political parties as "conspiracies" - groups that hoard secret information to win a competitive advantage over the general public. Leaks cut these groups open like a double-edged knife, empowering the public with privileged information while spreading confusion among the conspirators themselves, he said. If leaking were made easy, Assange argued, conspiratorial organizations would be gripped by paranoia, leaving transparent groups to flourish.





When the group published 250,000 U.S. State Department cables in 2010, it helped launch a multimillion dollar quest to unmask insider threats at home while causing problems for U.S. diplomats overseas. The recent leaks have affected the Democratic National Committee in much the same way, with staffers advised to use caution when communicating about sensitive topics.

Clinton supporters say Assange is targeting her out of partisan bias. U.S. intelligence officials believe Russia is behind the hacks to interfere in the U.S. election.

“Wouldn’t it be good reading to see internal discussions (about) Trump’s taxes?” Clinton Press Secretary Brian Fallon tweeted recently. “Wikileaks isn’t targeting Trump. That tells you something.”

It’s possible that malicious sources are using WikiLeaks for their own ends, said Lisa Lynch, an associate professor at Drew University who has also followed Assange’s career. But she noted that a lifetime far from public service and an aversion to email make Trump a more difficult target.

“If Trump had a political career, he’d be more available for Wikileaking,” she said.

Assange did not return messages seeking comment, but he has described allegations that he’s in the service of the Kremlin as a conspiracy theory and has denied picking sides in the U.S. electoral contest.

“Mr. Assange has not endorsed any candidate,” the group said in a statement Monday.





He has targeted Republican politicians in the past; in the run-up to the 2008 election his group published the contents of vice presidential candidate Sarah Palin's inbox. Her reaction at the time anticipated the Democrats' outrage today.

"What kind of a creep would break into a person's files, steal them, read them, then give them to the press to broadcast all over the world to influence a presidential campaign?" Palin wrote in her autobiography, "Going Rogue."

In fact, Assange has long tried to influence presidential campaigns. In 2007, WikiLeaks published a long-suppressed corruption report ahead of Kenya's national elections. It unleashed a wave of anger and, Assange often boasts, swung the vote.

In reality, the publication barely played a role in Kenya, according to Nic Cheeseman, an associate professor of African politics at the University of Oxford. And it's not clear whether the recent WikiLeaks revelations will fare differently. Clinton has a commanding lead in the polls despite the leaks.

Still, Assange appears game to try. Between the DNC emails and the inbox of Clinton campaign chairman John Podesta's messages, his organization has published 46,000 messages from some of the most powerful people in Democratic politics. More is coming. When one Twitter user noted that WikiLeaks had not published any of Podesta's emails dating past March 21, WikiLeaks responded .

"Well spotted," it said. "Something to look forward to."



# SCIENCE

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Q&A:  
FISH AND  
POLITICS  
BEHIND  
ANTARCTIC  
MARINE  
RESERVE DEAL







Nations from around the world last Friday (28) reached an historic agreement to preserve an area of ocean near Antarctica that's about twice the size of Texas. Here are some questions and answers about the deal:

### **Q: WHAT'S SPECIAL ABOUT THE AREA?**

A: The marine protected area will be in the Ross Sea, considered to be one of the most pristine environments in the world. New Zealand officials say that at different times, the area is home to about one-third of the world's Adelie penguins and 26 percent of the world's emperor penguins. It also boasts thriving colonies of seabirds, seals and whales. Researchers say the region is important to study because it is almost untouched by humans, and should remain that way. Several countries fish in the region for lucrative Antarctic toothfish, which are often sold in stores and restaurants as Chilean sea bass.

### **Q: WHAT MAKES THIS AGREEMENT GROUNDBREAKING?**

A: Individual nations across the globe have set aside dozens of marine reserves. But proponents say this is the first time that a bunch of nations have collaborated to protect an area on the high seas - the open ocean that falls outside the jurisdiction of any one nation. The deal was put together by New Zealand and the U.S.

### **Q: WHAT ARE THE DETAILS?**

A: The reserve covers 1.6 million square kilometers (617,000 square miles), making it the world's largest marine protected area. About 72 percent will be a no-take zone, where commercial fishing will be banned. In the







remaining areas, limited fishing for toothfish or krill will be allowed, although fisher folk will be required to do extra monitoring and tagging so scientists can evaluate what's happening to fish stocks. Researchers can apply to take limited numbers of fish from throughout the reserve.

### **Q: WHAT ABOUT THE POLITICS?**

A: Many are surprised the deal came together at all, especially because it required the U.S. and Russia to agree at a time when tensions between them are running high. Antarctic fishing is regulated by the Commission for the Conservation of Antarctic Marine Living Resources, whose members include 24 nations and the European Union. All agreements must be unanimous, which has proved a stumbling block in the past for a group with such divergent politics and interests. Many nations had been pushing for a reserve but a few had resisted, with Russia becoming the final holdout. The deal made some small concessions to Russia by altering the boundaries and by increasing the fishing quota outside of the no-take zone.

### **Q: WHAT'S NEXT?**

A: Environmentalists hope the deal will pave the way for future agreements on the high seas, and that one day a big chunk of the world's oceans will be protected as a result. It could also help speed along plans for other marine reserves around Antarctica. The agreement takes effect in December 2017 and, in the no-take zone, runs for 35 years. At that point, the member nations will again need to reach consensus for the reserve to continue - no simple task judging by the contentious nature of past negotiations.





# TRUMP IS MASTER OF HIS DOMAINS, EVEN ONES THAT BASH HIM

Whoever owns [donaldtrumpsucks.com](https://donaldtrumpsucks.com) must really hate Donald Trump, right? Wrong! It's the Donald himself.

The same goes for [no2trump.com](https://no2trump.com), [trumpmustgo.com](https://trumpmustgo.com) and two dozen other web addresses that sound like they're bashing the billionaire Republican presidential nominee, his business interests or his political aspirations.

What would Trump want with such insulting domains? Easy. To make sure his critics and rivals can't have them.

He and his Trump Organization own more than 3,600 web addresses, according to the research firm DomainIQ. The vast majority bear the names of his properties, products and progeny. There are 274 domains alone featuring the name of Trump's daughter Ivanka.

And then there are the ones that seem better suited for the anti-Trump crowd: eight domains ending in "scheme," eight ending in "fraud" and eight ending in "sucks."

It is common for businesses and celebrities to scoop up and sit on web addresses that could be used to mock or attack them.

Cable giant Comcast owns [ihatecomcast.com](http://ihatecomcast.com), and Verizon holds [verizonsucks.com](http://verizonsucks.com). Colleges have made a habit of buying up versions of their names ending in .xxx to prevent them from falling into the hands of pornographers, and Major League Baseball has registered the names of various teams ending in .sex.

"Domains are cheap," branding expert Rebecca Lieb said. "Mopping up when somebody acquires a domain and does something malicious with it is expensive."

Trump's collection of web addresses good and bad is far more extensive than that of any candidate before. He and the Trump Organization own a few hundred more than Target Corp. or General Motors.

Hillary Clinton's campaign owns 70, according to DomainIQ, though none appear to be the kind of derogatory names Trump has registered. Her family's foundation owns 214 domains, including four ending in .xxx.





“Mr. Trump has built a globally recognized, highly successful brand, and it’s only natural he would attempt to protect his name and his brand in all respects,” Trump campaign spokeswoman Hope Hicks said in an email Monday.

Web addresses cost just a few bucks to register. After that, you can sell them to the highest bidder - unless someone steps in and successfully claims that the domain involves a trademark.

That’s how Trump has gotten his hands on Trump-related addresses that other people registered before he could. His lawyers have sent cease-and-desist letters and gone to arbitration at least 40 times to force outsiders to hand over domains, including MelaniaTrump.com.

Trump and his team didn’t take any chances in 2009 when he created the Trump Network brand to sell vitamins, urine tests and other health products. They quietly scooped up 18 negative domain names, including DonaldTrumpPonziScheme.com and TrumpNetworkFraud.com.

Trump also tried to head off the haters when he ventured into the liquor business with Trump Vodka in 2005. Along with trumpspunch.com, trumpwithatwist.com and yourefiredvodka.com, Trump’s company registered ihatetrumpvodka.com and trumpvodkasucks.com.

And last year, as his run for the White House focused new attention on Trump University’s questionable practices, Trump and his team registered trumpfraud.com and three similar domains.











Trump's roster traces his professional ambitions and personal milestones, with registrations tied to the start of big projects and the arrival of children and grandchildren, and addresses for ventures that never got off the ground or ones like [trumponair.com](http://trumponair.com) that could be ripe for use if he loses on Nov. 8.

There are domains for an unrealized plan to build a NASCAR speedway in the early 2000s, a failed attempt to acquire Gianni Versace's Miami Beach mansion in 2013 and an unsuccessful push to develop a North Carolina golf resort.

There are domains for a Trump-produced Broadway show featuring the music of Irving Berlin. The curtain never rose, but Trump still owns [trumpfollies.com](http://trumpfollies.com). And then there are the politically themed domains that appear to coin new terminology: [trumpublican.org](http://trumpublican.org) and [trumpocrat.net](http://trumpocrat.net).

Despite Trump's efforts, some of his tormentors have beaten him to the punch.

Chris Puchowicz bought [trump.org](http://trump.org) for \$1,272 at an auction in 2012 and snagged [trump.tv](http://trump.tv) for \$251 a few months later. The Trump Organization didn't make a bid, he said, but the company's lawyers later threatened a lawsuit. Puchowicz still owns the domains and has used them to post an anti-Trump rant.

Brian Lam, a software engineering student in St. Louis, spent \$9 to register [votefortrump Pence.com](http://votefortrump Pence.com). He then posted a photo of himself giving the finger to the camera over the words "Just Kidding."

But all is not lost. Trump still owns [ilovedonaldtrump.com](http://ilovedonaldtrump.com).

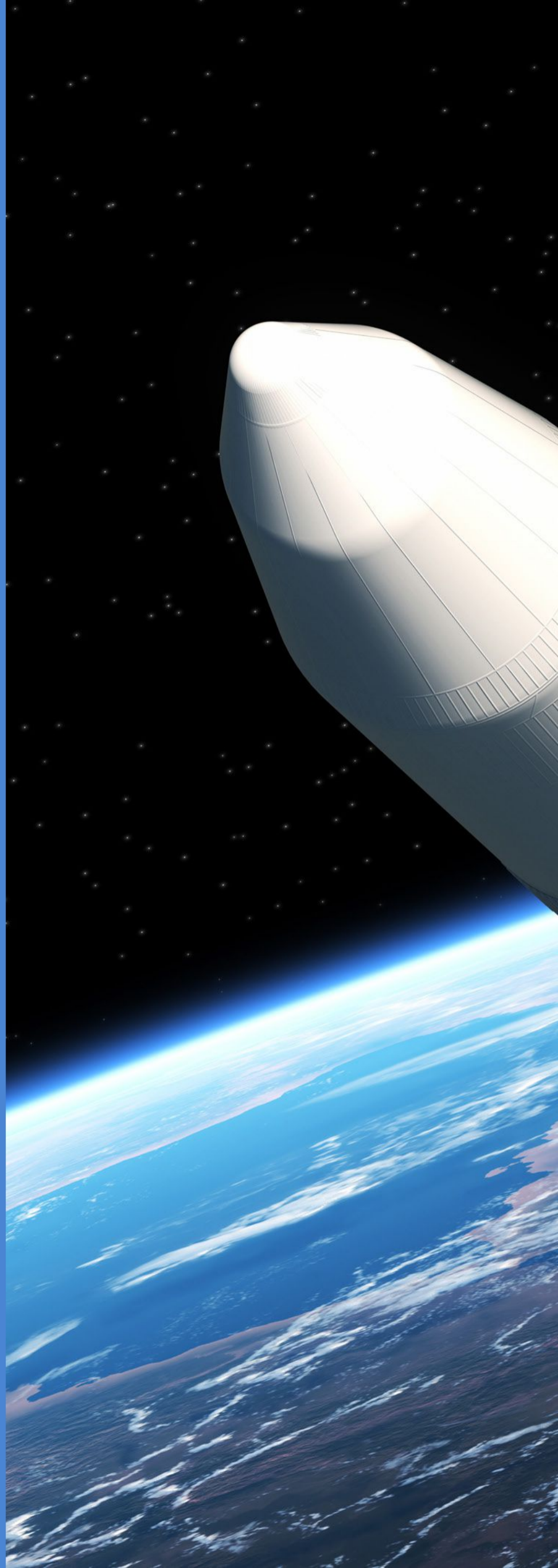
# CHINA SAYS NEW ROCKET BRINGS SPACE STATION PLANS CLOSER

China's plans for a permanent space station remain firmly on track with the successful launch of its new heavy-lift Long March 5 rocket that will enable ambitious future missions, including a planned trip to Mars.

The towering rocket that blasted off from the Wenchang launch center will be used to launch components for the Tiangong 2 space station and other massive payloads.

China launched the Tiangong 2 precursor facility in September and sent up two astronauts in mid-October to live aboard it for 30 days. The station's 20-ton core module will be launched in 2018, and the completed 60-ton station is set to come into full service in 2022 and last at least a decade.

The Tiangong, or "Heavenly Palace," stations are considered stepping stones to an unmanned mission to Mars by the end of the decade.

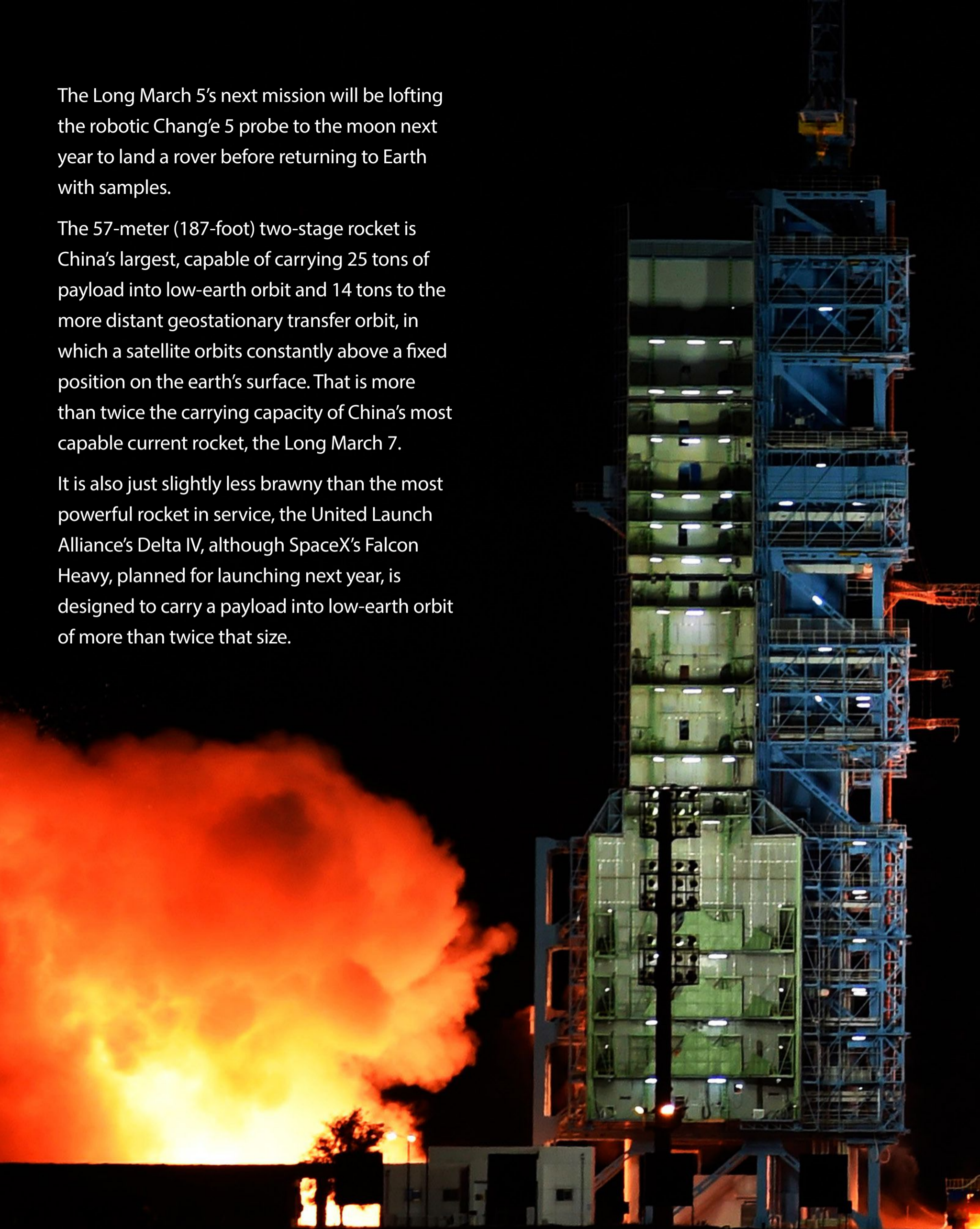




The Long March 5's next mission will be lofting the robotic Chang'e 5 probe to the moon next year to land a rover before returning to Earth with samples.

The 57-meter (187-foot) two-stage rocket is China's largest, capable of carrying 25 tons of payload into low-earth orbit and 14 tons to the more distant geostationary transfer orbit, in which a satellite orbits constantly above a fixed position on the earth's surface. That is more than twice the carrying capacity of China's most capable current rocket, the Long March 7.

It is also just slightly less brawny than the most powerful rocket in service, the United Launch Alliance's Delta IV, although SpaceX's Falcon Heavy, planned for launching next year, is designed to carry a payload into low-earth orbit of more than twice that size.





Not to be outdone, China is working on an even bigger rocket capable of lifting 100 tons of payload into low-earth orbit, Tian Yulong, the program's chief engineer, was quoted as saying at a news conference following Thursday's launch. That would put it in the range of the now-retired Saturn 5 rockets the U.S. used in the Apollo lunar missions.

Unlike earlier rockets that used highly toxic fuels, the Long March 5 burns a more environmentally friendly and less expensive kerosene-liquid oxygen-liquid hydrogen mix. It has a takeoff weight of 870 tons and a thrust of 1,060 tons. Wenchang on the southern island of Hainan is China's fourth and newest launch site.

Although Thursday's mission was mainly designed to test the reliability of the Long March 5, it also carried a satellite for testing technology used to observe space debris, new electric sources and electric propulsion, according to the official Xinhua News Agency.



中国酒泉卫星发射中心

万众一心 共圆中国梦



Its upper section, the Yuanzheng 2, is designed to better launch multiple satellites and send them directly into orbit, Xinhua said.

In a joint congratulatory letter following the launch, the ruling Communist Party's Central Committee, the cabinet and the commission overseeing the military praised the new rocket as "the pinnacle of innovation in carrier rocket science and technology."

"Its successful launch... marks a milestone in China's transition from a major player in space to a major power in space," the letter said, according to state media.







# THE EVOLUTION OF AMY ADAMS ON VIEW IN 'ARRIVAL,' 'NOCTURNAL'

For a time, Amy Adams, a former chorus girl from Colorado, was known for her princesses and country girls: sweet and sunny characters that helped make Adams a star.

"I call them the innocents - like Picasso, my 'innocent period,'" Adams says, chuckling. "But the naivety or anything that I brought to a role, I didn't feel trapped by it. I thought each of them saw the world in a different way. I was perplexed that people saw me in that way but I understood it. I didn't know when or how that would change, but I knew it needed to in order for me to evolve as an actress."

That evolution has been going on for some time, from the forceful restraint of her performances in "Doubt" and "The Master" to more unbridled outings in a pair of David O. Russell films, "The Fighter" and "American Hustle." At 42, she is already a five-time Oscar nominee. But this fall, in a pair of intelligent, layered performances, Adams' expanding range and growing complexity has never been more on view.

In Denis Villeneuve's "Arrival," she stars as a linguist tasked by the government with communicating with newly landed aliens whose sleek, orb-like ships are mysteriously hovering just off the ground. The movie, which opens Friday, is thick with a "Close Encounters of the Third Kind" atmosphere and resonant - through Adams' performance - with deeper emotions than your average sci-fi film.

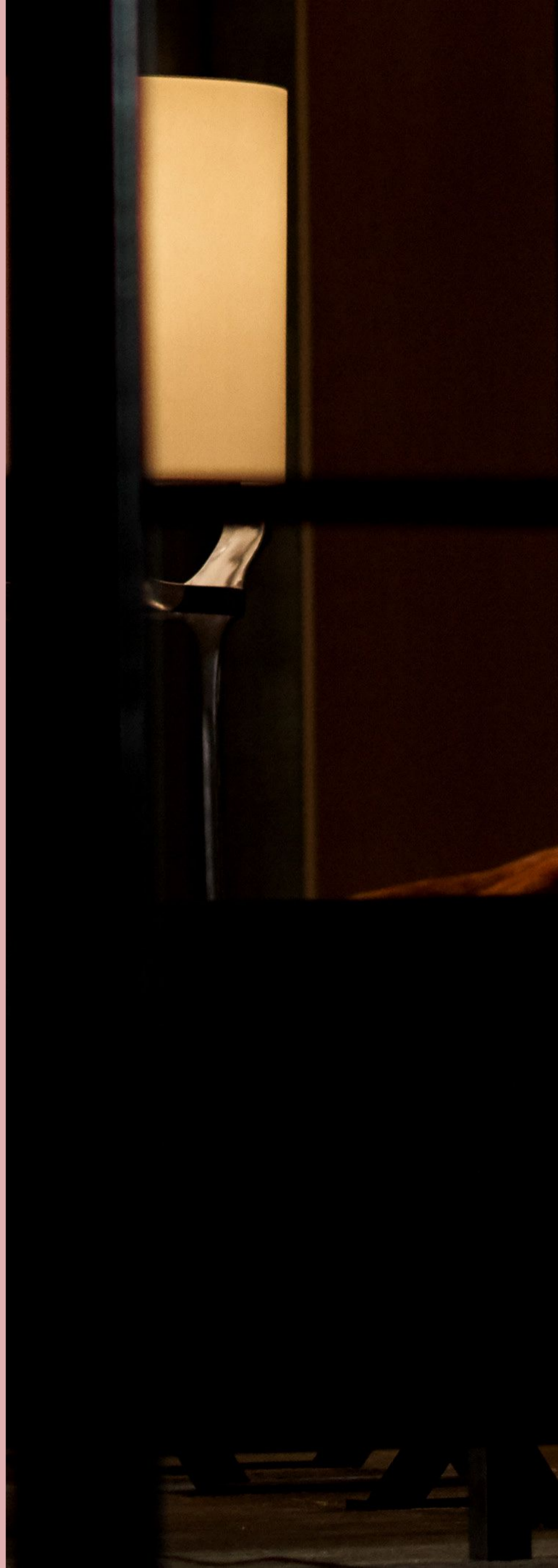
Adams also stars in Tom Ford's "Nocturnal Animals" (out Nov. 18), as a Manhattan gallerist trapped in an unhappy marriage. When a novel written by her first husband (Jake Gyllenhaal) arrives, she's teleported into a fictional world. The book's story, a bloody thriller, is heavy with personal subtext.

"Both of these characters come to a crossroads and I feel like I'm at a bit of a crossroads," Adams reflected in an interview in September at the Toronto International Film Festival, where both films played.

"It's being a mom and entering my 40s and looking at things in a different way, a way that has been really awesome," Adams said of her shift. "I feel really happy about the changes that have happened internally. I feel like these films helped that happen."

But those changes, she says, are mostly about finding a balance between her career and her family life. She and husband Darren Le Gallo have a six-year-old daughter.

Though spelling out the connection would give too much away, motherhood was an especially powerful influence on "Arrival." Adams agreed to do the film within 24 hours of being sent the script.





“Every time I start talking about my daughter in relationship to ‘Arrival,’ it goes straight to tears,” says Adams. “My husband saw the film before I did and he couldn’t talk to me for a while.”

Adams’ range as an actress is a sneaky kind. There are no tales of tortured transformations. She simply keeps showing up in role after role, fully inhabiting a character with warmth and smarts while, to varying degrees, remaining herself.

Working with her acting coach, Warner Loughlin, Adams builds the essence of a character in advance of shooting so that she can be free and reactive on set. That was especially necessary in both “Arrival” and “Nocturnal Animals” because both films call on her to express much without speaking. In the latter, she’s often just reading.

“I have to be active and I have to drive a sort of emotional core through the movie,” says Adams, “but yet I’m very much reactive at the same time. In ‘Nocturnal Animals,’ I was alone a lot.”





Villeneuve, the Quebec director of "Sicario" and "Prisoners," says he needed a strong actress who could emote a lot while often acting against a tennis ball.

"I knew that the movie would be on her shoulders," says Villeneuve. "I wanted someone who you could read what was she was going through without words. The movie is Amy Adams, to me."

Ford, the fashion designer whose previous film, "A Single Man," pursued Adams for some of the same qualities.

"It's in her eyes. She has a soul and you can look right into her eyes and see it. You cannot not like Amy Adams," says Ford. "There was not a bad take of that woman. Her brain is always moving and everything she's thinking is always on her face."

Adams hasn't entirely left "the innocents" behind. She will reprise her "Enchanted" role in a sequel for Disney. And she has reliably been the most lively, intelligent thing in the DC Comics films as Lois Lane.

"I'd love to do a whole Lois thing but I don't think that's where they're going," she says, with sarcastic understatement. "I can safely say that 'Justice League' is not a Lois Lane stand-alone."

Unfortunate as that is, the question remains: What can't Amy Adams do?

"I can't speak Mandarin. I can tell you that from my experience on 'Arrival,' Adams says. "That was the only time Denis and I had any conflict, because I was so stressed out. He was like (dropping her voice for a spot-on impression of Villeneuve's deep Quebecois accent), 'You have to calm down. You must calm down.'"





HUMAN







# CARRIE FISHER REVEALS 'STAR WARS' AFFAIR WITH HARRISON FORD

Carrie Fisher has revealed that Princess Leia's romance with Han Solo in "Star Wars" extended off-screen, as well.

Fisher tells *People* magazine that she enjoyed an "intense" affair with co-star Harrison Ford during the filming of the 1977 blockbuster.

Fisher was 19 and Ford was 33 and married at the time of what she says was a three-month affair. The actress tells *People*, "It was Han and Leia during the week, and Carrie and Harrison during the weekend." She says the romance ended when shooting on the film did.

Fisher writes about the fling in her new book "The Princess Diarist," which recounts her experiences on the "Star Wars" set. She says that she gave Ford a heads-up about the book and he received a draft.

A representative for Ford didn't immediately respond to a request for comment.

# FACEBOOK'S FAKE NEWS PROBLEM: WHAT'S ITS RESPONSIBILITY?

Facebook is under fire for failing to rein in fake and biased news stories that some believe may have swayed the presidential election. Its predicament stems from this basic conundrum: It exercises great control over the news its users see, but it declines to assume the editorial responsibility that traditional publishers do.

Facebook took a minor step to address the issue, clarifying its advertising policy to emphasize that it won't display ads on sites that run information that is "illegal, misleading or deceptive, which includes fake news." The company said it was merely making explicit a policy that was already implied.

Its move followed a similar step by Google earlier, after the search giant acknowledged that it had let a false article about the election results slip into its list of recommended news stories.

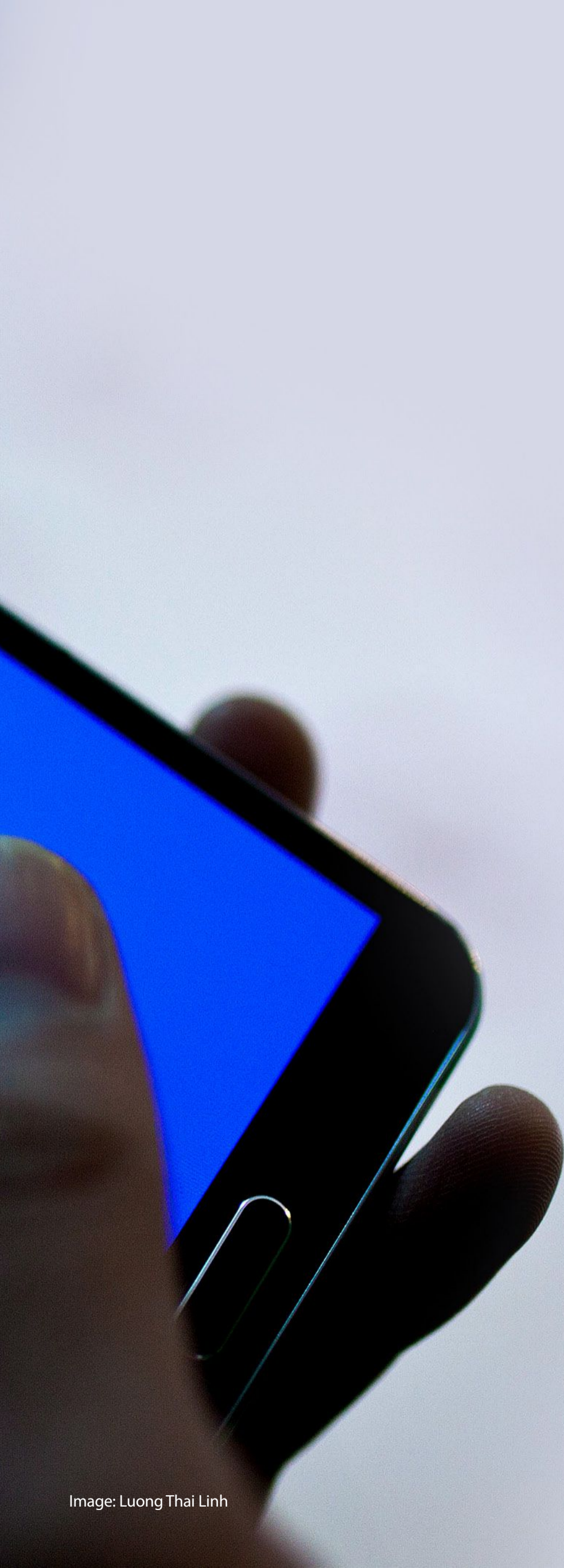
In the case of both companies, the aim is to discourage fake-news sites by depriving them of revenue.







facebook



Facebook is also said to be facing brewing internal turmoil over its influence and what it can and should do about it.

Employees have expressed concern over Facebook's role in spreading misinformation and racist memes largely associated with the alt-right, according to The New York Times and BuzzFeed. Some have reportedly formed an unofficial task force to investigate the role the company played in the election.

Founder and CEO Mark Zuckerberg, however, insists that Facebook remains a neutral technology platform where its users can share anything they want, with only a tiny fraction of it fake or problematic.

Last week, Zuckerberg called the idea that voters might have been influenced by what they saw on Facebook - fake, uber-partisan stories, such as a false one about Pope Francis endorsing Donald Trump for president - "pretty crazy."

## **FACEBOOK CONTROL**

People update to Facebook so frequently that the company has no choice but to filter what everyone sees in their news feeds - the main artery through which users see posts from their friends, family, businesses, news sources and celebrities they follow.

The company's secret algorithms are designed to deliver the posts from friends and other sources that will draw people in and lead them to read and click and "like" and share - "maximizing their engagement," in Facebook's jargon.





Facebook frequently tweaks its algorithm to improve engagement. Various changes have been aimed at shutting out sites that promote clickbait and other garbage that users say they don't want to see, even as they click on it and share away. When users are surrounded by posts they want to see, they're more likely to stick around.

That's key to Facebook's advertising business. But it can be problematic when it comes to false but highly interesting posts.

Facebook's news feed "maximizes for engagement. As we've learned in this election, bulls--t is highly engaging," former Facebook product designer Bobby Goodlatte wrote in an Election Day post. "Highly partisan, fact-light outlets" on both the right and the left, he wrote, "have no concern for the truth, and really only care for engagement. ... It's now clear that democracy suffers if our news environment incentivizes bulls--t."

Social media companies today have to acknowledge that they are news organizations, said Jeffrey Herbst, president and CEO of the Newseum, a journalism museum in Washington. "Not like news companies of the 20th century," he added. "But not just pipes where people get their news. They determine what is news."

In a post Saturday night, Zuckerberg rejected that idea.

"News and media are not the primary things people do on Facebook, so I find it odd when people insist we call ourselves a news or media company in order to acknowledge its importance," he wrote. "Facebook is mostly about helping people stay connected with friends and family."

# Tim

## FACEBOOK AS NEWSPAPER - NO, SCRATCH THAT

Back in 2013, Zuckerberg said he wanted Facebook to be people's "own personal newspaper," one that delivers the stories most interesting and important to them. That's still the company's goal - though minus any reference to itself as a media company of any kind.

Of course, fake stuff has existed on the internet long before Facebook. And under the law, Facebook is no more responsible for what appears on its site than "the paper mills that print newspapers are responsible for their content," said Steve Jones, a professor at the University of Illinois at Chicago who studies communication technology.

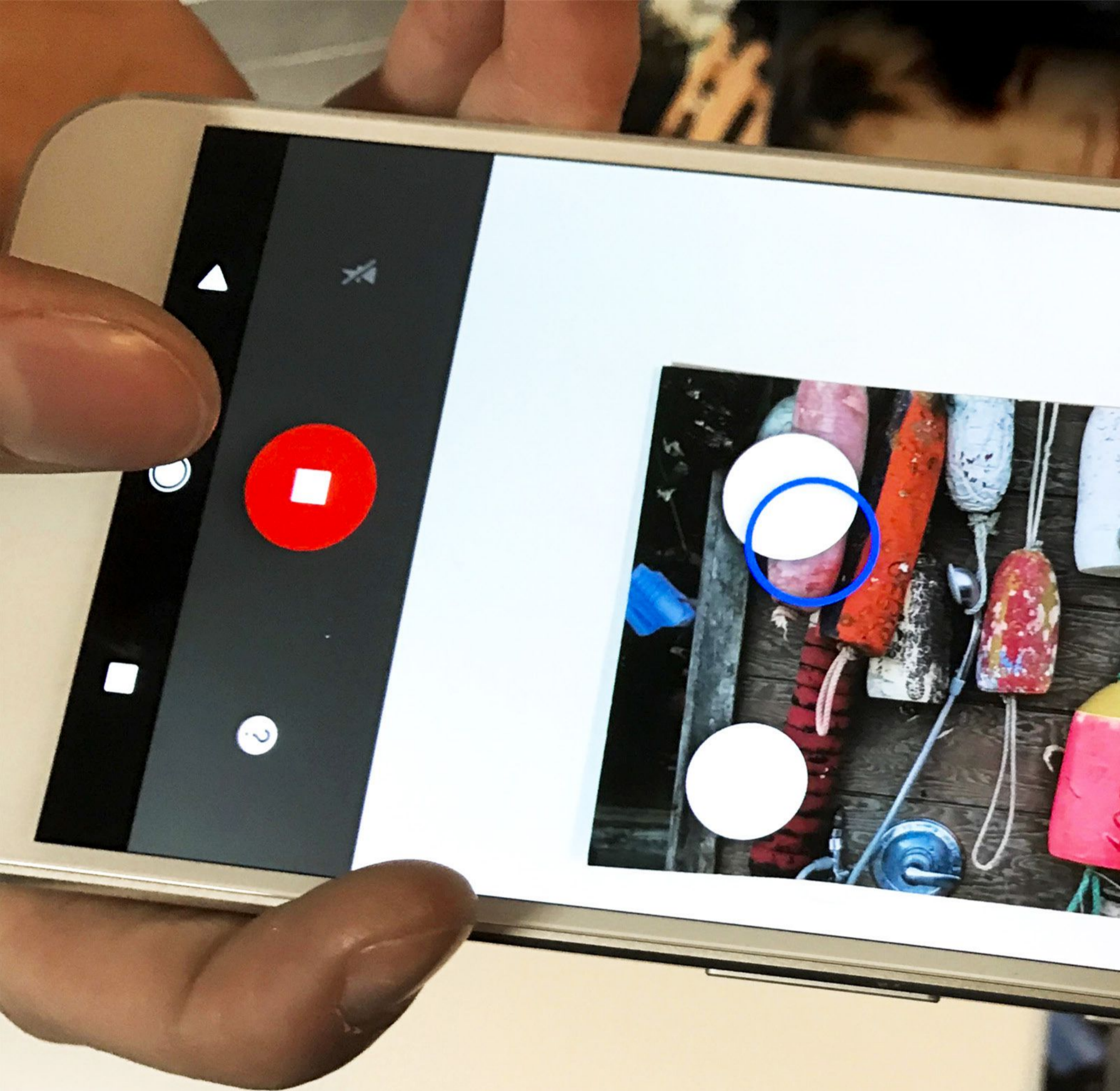
At the same time, Jones said he thinks the broader issue of Facebook's responsibility is one that's going to be "debated forever."

"Even the notion of truth is something that's highly contested at this point," he said.



# neline







# GOOGLE RELEASES APP TO DIGITIZE BOXES OF OLD PHOTO PRINTS

Google wants to make digitizing your many boxes of old photo prints as easy as opening an app.

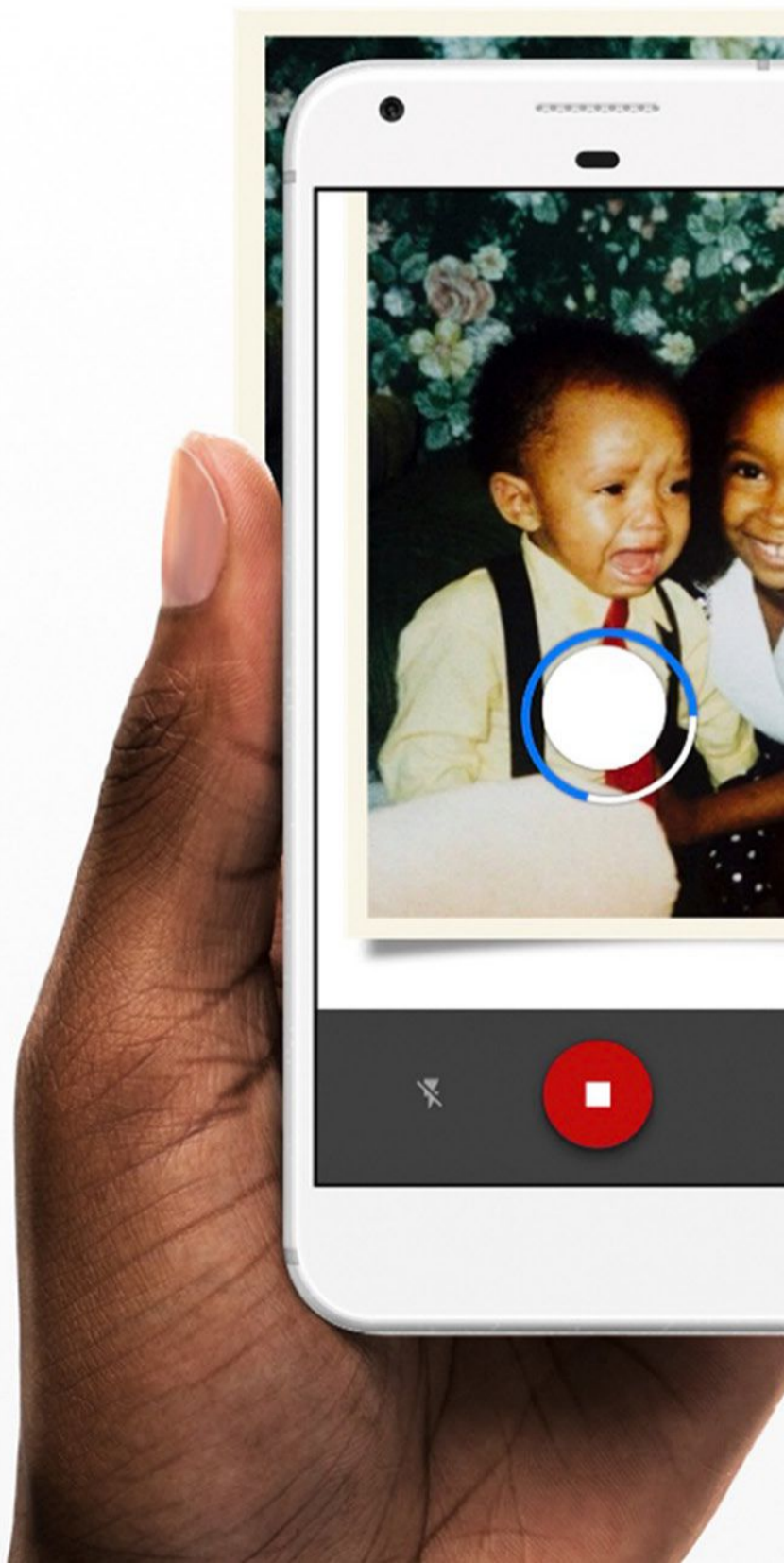
The PhotoScan app for iPhones and Android phones will use the phone's camera to capture an old photo in four sections and stitch them together, much like a panorama shot. Google says this approach helps eliminate glare that can mar attempts to digitize a print by simply photographing the whole photo.

The app will make minor adjustments to restore color in faded photos and to aligned corners when the photo print is bent.

Julia Winn, a product manager for the new app, said scanning photos with traditional scanners takes time, while third-party digitizing services cost money and require you to part with your photos temporarily, risking loss and damage.

The free app will work with photos on a table, a picture frame and an album. It will also digitize slides when projected on a wall. Winn said the resolution of the digitized photo will be comparable to that from a flatbed scanner.

You can store digitized versions on your phone or the online Google Photos service, which has unlimited storage for photos of up to 16 megapixels.



Other photo features announced Tuesday include:

- The main Google Photos app is getting additional editing controls. There are new filters for those who like automation and more granular controls for those who prefer manual editing. The new manual options include “deep blue” to give skies and water more color, without oversaturating the rest of the photo, and “skin tone” to adjust only the colors on skins.

- The service will also automatically generate additional types of video highlights, with background music, from your collection of photos and videos. The service initially organized images only around location and date. It recently started creating reels following a kid growing up. A new type, called lullaby, will gather shots from a newborn’s initial days. Coming next month: Christmas shots and happy moments from 2016. Pets and outdoor videos are coming in 2017.







# LYFT LIFTS OFF WITH NEW LOOK, LIGHT-UP BEACONS

Ride-hailing service Lyft, the underdog rival to Uber, is getting rid of its iconic pink moustache logo and replacing it with something more useful - beacons.

The light-up beacons, which Lyft calls “amps,” will be on the dashboard of Lyft drivers’ cars beginning Jan. 1 in New York, Las Vegas, San Francisco and Los Angeles.

Beacons can communicate with people’s smartphones using Bluetooth technology. In retail stores, this means guiding you to a certain shoe display, for example.

With Lyft, it means having your driver’s beacon light up a specific color once he or she is near. You can have your phone light up in that same color, too, then hold it up so the driver can see you.

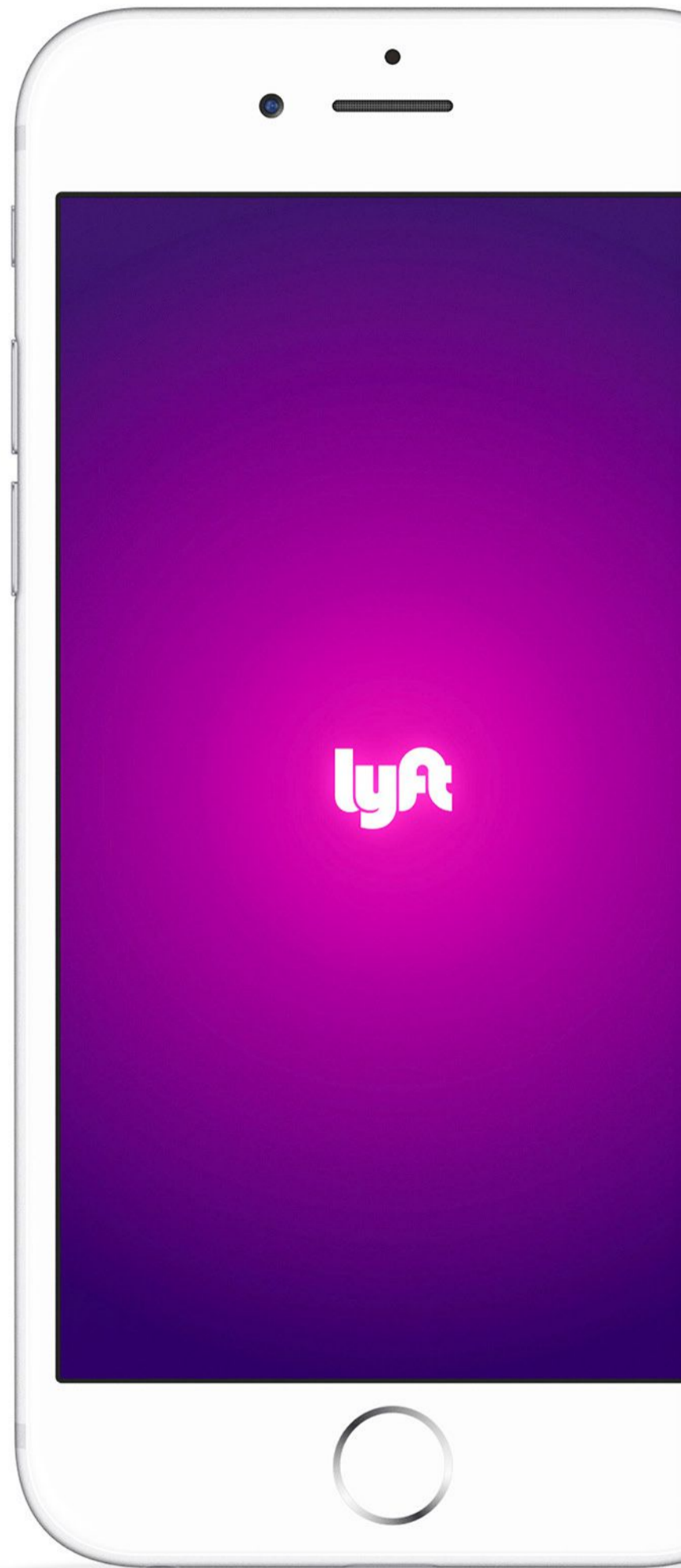
Lyft says this will make it easier and safer for drivers and riders to find each other. This can be especially helpful at night, or in crowded areas where multiple people might be hailing a ride.

San Francisco-based says it won't use the beacons for ads, though the passenger-facing side might be devoted to sponsored campaigns, such as a beer company warning against drinking and driving.

Lyft's first symbol was a giant, bright pink, fuzzy moustache attached to the front of drivers' cars. But it soon became cumbersome (it could get quite dirty, for example), and maybe a little too whimsical for a company working to expand. Next came the "glowstache," a compact, pink, glowing plastic moustache. The amp, while still bright pink, is a clean, oval shape.

Lyft held a retirement party for the 'stache, said Melissa Waters, vice president of marketing. But the pink stays.

"It's loud, proud, quirky, fun," she said. In upcoming TV ads, Lyft paints itself as just that, in deep contrast to a menacing, slick ride-hailing company called "Ride Corp."





2:30 PM

2300 Harrison St  
Pickup location

2 MIN

**Set pickup**

2:30 PM

**YOUR DRIVER WILL ARRIVE IN 2 MIN**

Toyota Prius  
4ABC123

Samantha  
★ 5.0

- 2300 Harrison St
- Caltrain Station

Contact   Split   Send ETA   Cancel ride

# MONEY, MONEY, MONEY: MANAGING IT ON iOS

USE APPS TO HONE  
YOUR MARKET  
TRADING SKILLS



\$

\$

\$

11

12

1

High

96.92

Low

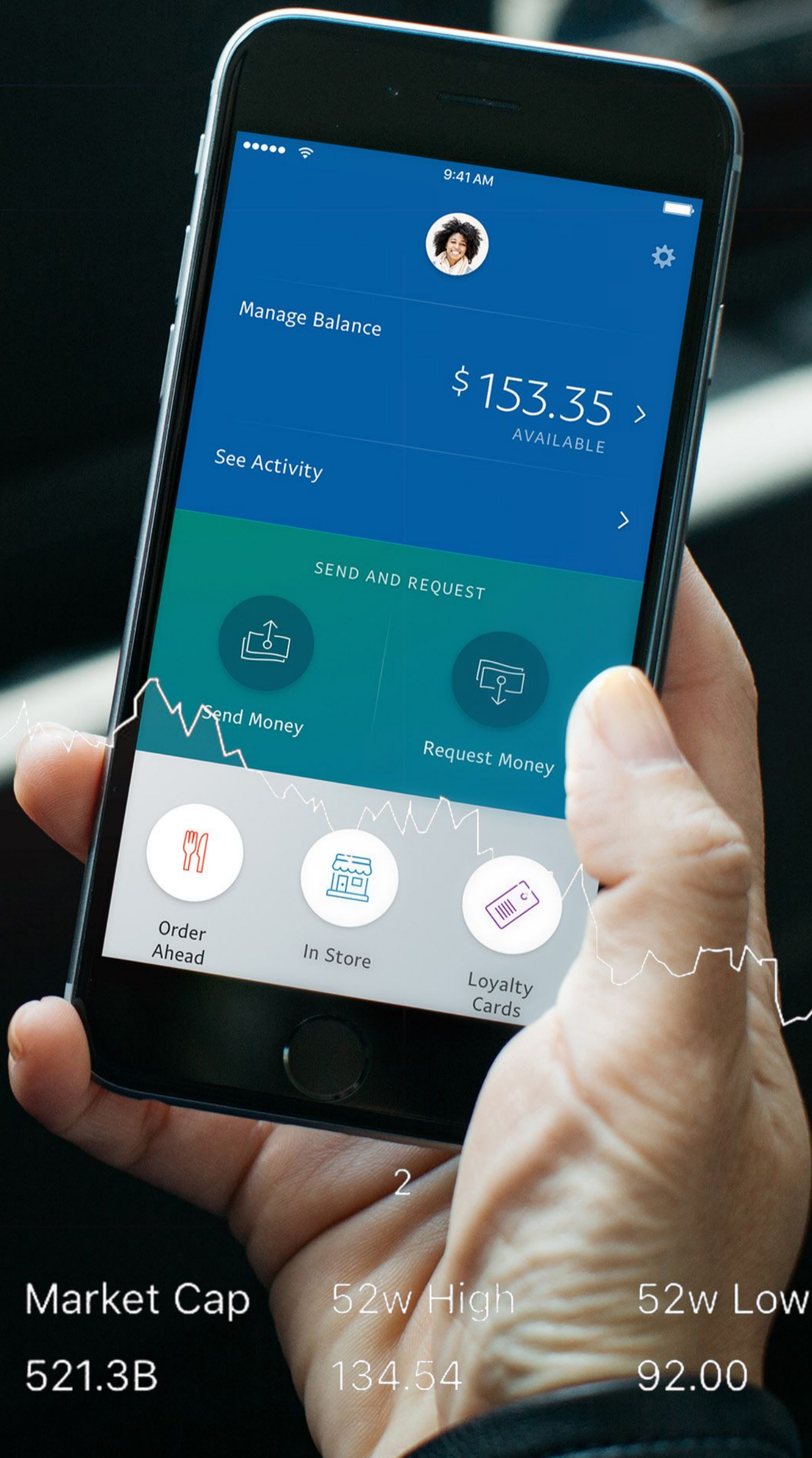
93.69

Vol

46.40M

P/E

10.01



Market Cap  
521.3B

52w High  
134.54

52w Low  
92.00

Avg Vol  
48.26M

2

3

\$





## FINANCE APPS FOR iPhone, iPad AND APPLE WATCH

On the face of it, keeping your money situation in order should be pretty simple: as long as you are bringing in at least as much money as is going out, you're in good financial shape. However, the process can actually be much trickier than this single sentence would lead you to believe. Thankfully, our iPhones and iPads are already helping us to organize and improve many aspects of our lives – so why shouldn't we pay more attention to what they can do for preventing our cash from running too low?

### TAKE STOCK WITH THE STOCKS APP

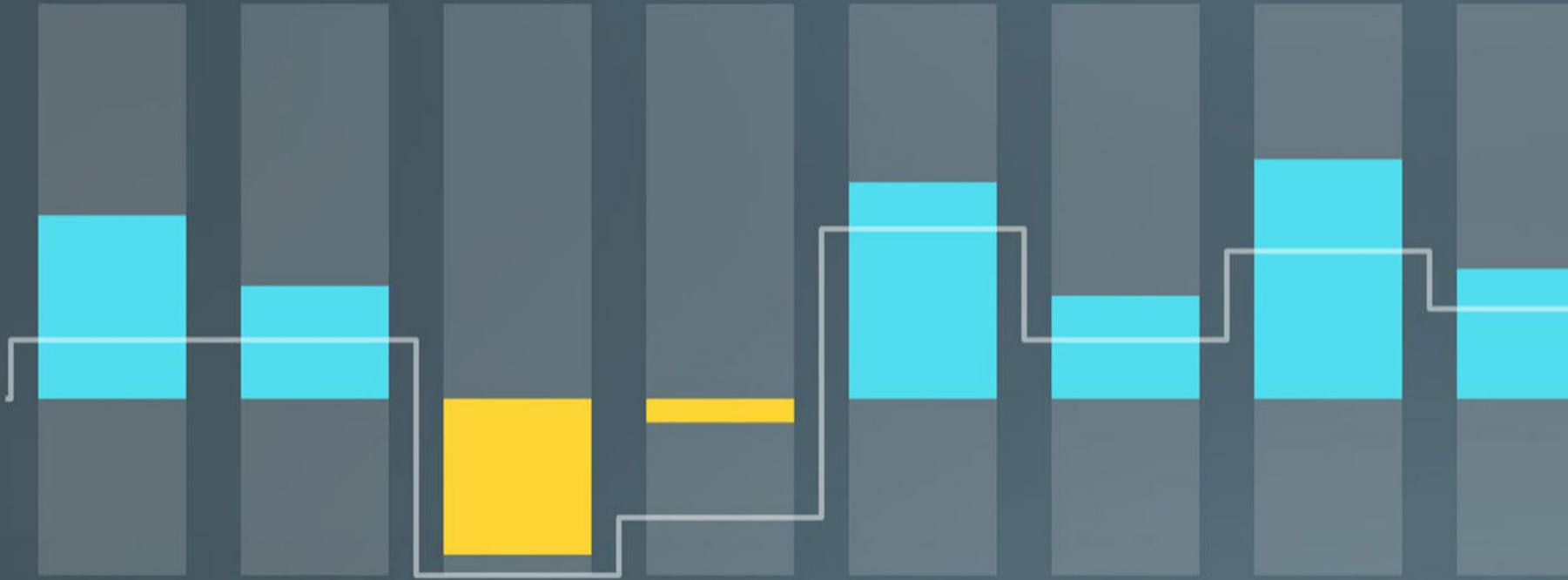
There are various ways we can make more money, and an obviously decent money-spinner – provided that you know what you're doing, of course – can be trading or investing. Whether you are a day trader or long-term investor, it's a good idea to turn to the Stocks app. Preinstalled on all new iPhones, it's largely as straightforward as its to-the-point name would suggest, as it's great for speedily checking the stocks and markets that will have the greatest effect on you.

It's not too tricky to get to grips with, either – iMore has posted **a comprehensive guide to using the Stocks app**, including adding, rearranging, deleting and viewing stocks and managing the app's notifications. However, we especially love how easy it is to check individual stocks or stock exchanges by turning to Siri. Just try it out by asking Siri "What is Apple's stock at today?" Hopefully, by the time you read this, iPhone sales will still be sufficiently healthy for the stock...

Edit

Oct 2016

\$8,894



Car  
1,816  
2,825



Home  
1,800  
1,800



Clothing  
800  
700



Dining  
650  
950



Taxes  
500  
500



Dividend in...  
7,000  
7,000



Salary  
6,000  
7,000



Gifts  
1,100  
0



Business in...  
800  
0

22  
Today

Balance

Budget



## KNOWLEDGE IS POWER

However, being adept with your dip into the markets isn't just a matter of buying whatever stock looks appealing at the time – it's also about thinking long-term and spotting emerging trends. For that, good sources of financial news could prove invaluable. Thankfully, there's an abundant supply of them in the App Store – a few notable examples being **CNBC Business News and Finance**, **Yahoo Finance**, **TheStreet: Stock Market News, Quotes, Financial Analysis** and **Bloomberg**. Meanwhile, financial periodicals available on your iOS device include **MONEY Magazine** and **Financial Post Magazine**.

## PERSONAL OR BUSINESS, YOU CAN HANDLE IT

Still, however successful you are in your trading or investing endeavors, the fruits of your labors could count for surprisingly little if your expenditure remains unduly high. That's why you should look into not only making money, but also carefully managing your incoming cash. It's where a good financial management app, like Money Pro, can help. You can **download versions of it for both your iPhone and iPad** and sync your data across the devices as you **plan bills, budget, keep track of your accounts and take on other responsibilities**.

Meanwhile, if it's the finances of a small business that you are seeking to manage effectively, you should pay close attention to **Intuit's QuickBooks accounting software**. Available in **versions optimized for iPhone and iPad**, it allows you to quickly look over how much



### #01 – CNBC Business News and Finance

By NBCUniversal Media, LLC

Category: Finance

Requires iOS 9.3 or later. Compatible with iPhone, iPad, and iPod touch.



### #02 – Yahoo Finance

By Yahoo

Category: Finance

Requires iOS 9.3 or later. Compatible with iPhone, iPad, and iPod touch.



### #03 – TheStreet: Stock Market News, Quotes, Financial Analysis

By TheStreet, Inc.

Category: Finance

Requires iOS 8.0 or later. Compatible with iPhone, iPad, and iPod touch.



### #04 – Bloomberg

By Bloomberg Finance LP

Category: Finance

Requires iOS 8.0 or later. Compatible with iPhone, iPad, and iPod touch.



### #05 – MONEY Magazine

By Time Inc.

Category: Finance

Requires iOS 7.0 or later. Compatible with iPad.



### #06 – Financial Post Magazine

By Postmedia Network INC.

Category: News

Requires iOS 7.0 or later. Compatible with iPad.



### #07 – Money Pro

By iBear LLC

Category: Finance

Requires iOS 8.0 or later. Compatible with iPhone, iPad, and iPod touch.

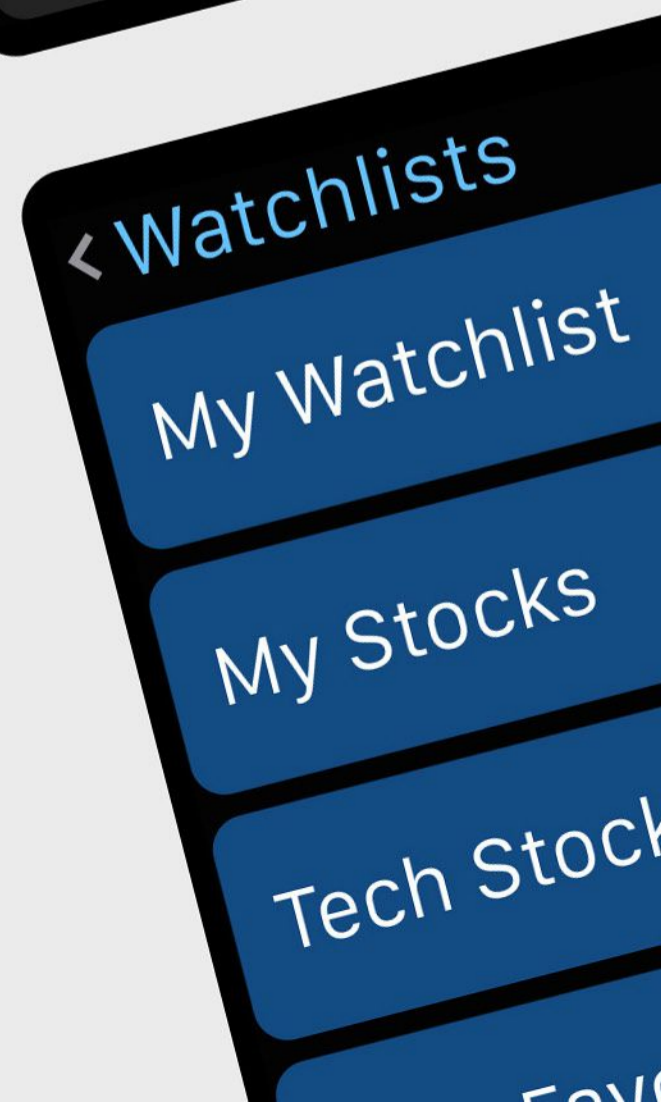


### #08 – QuickBooks Accounting

By Intuit Inc.

Category: Business

Requires iOS 9.0 or later. Compatible with iPhone, iPad, and iPod touch.





10:09

< S&P 500


S&P 500 Index

2066.96

+7.27 (+0.35%)

LOW	HIGH
2057.32	2072.17

Close



Oil expiration and earnings are big movers for Tuesday

< My Watchlist

- DJIA
- S&P 500
- NASDAQ
- AAPL

Tue 9



10:09

KS

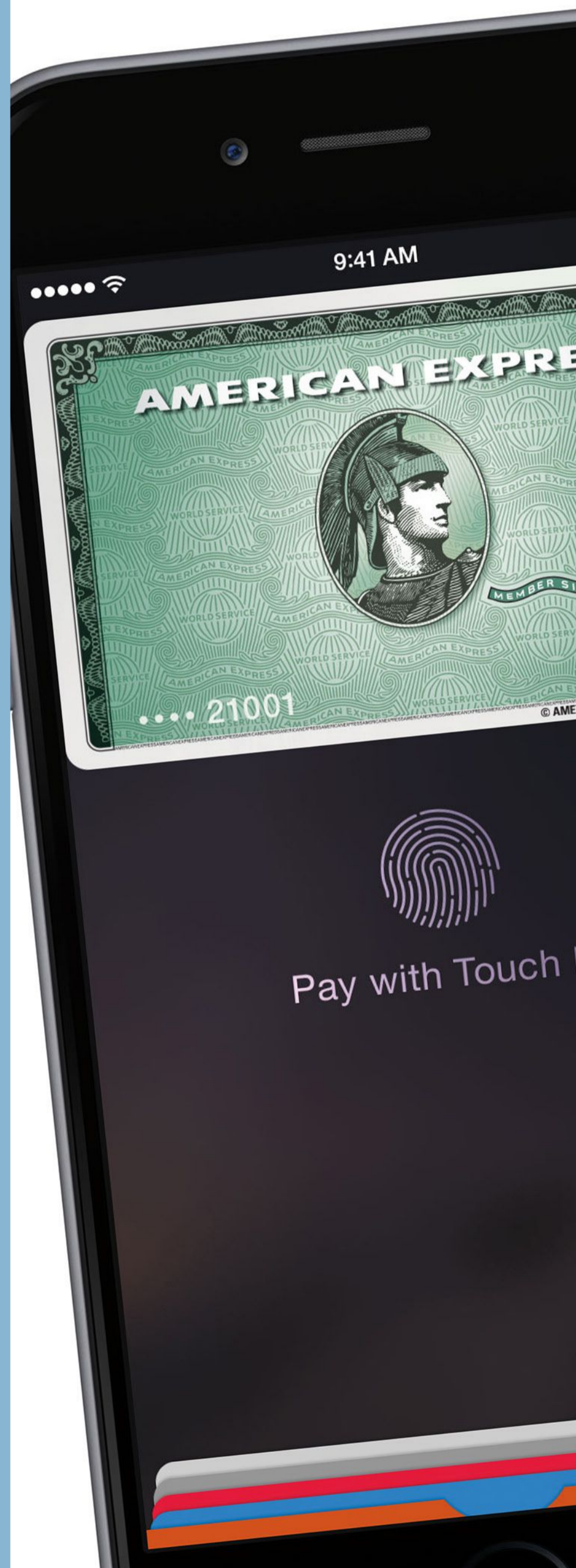
avorites

money your company is making and spending, open and overdue invoices, the day's account balances, and many more aspects of your company's financial health. You can initially try it for free with a 30-day trial – and it can make a great companion to the QuickBooks accounting app for Mac as well.

## DON'T USE YOUR WALLET – INSTEAD, USE WALLET!

The chances are that, over the years, you have amassed a great number of cards. While you have likely had a credit or debit card for a while, you could soon find your physical wallet overflowing as it struggles to contain such items as public transport passes, money-off coupons and loyalty cards. Having to carry all of these cards with you whenever you go out could not only literally stretch your wallet, but also regularly leave you with the cumbersome experience of sorting through all of them for that one card you really want at that particular moment. How time-draining...

Your answer to these problems could be your iPhone's Wallet app. Another app that is preinstalled on many new iPhones, Wallet allows you to register cards to give yourself digital versions that are readily accessible from the app. Many card providers have apps that let you register your cards in Wallet. iMore can again help out here, with **a detailed run-down of how you can add, refresh, reorder, share and remove cards in Wallet**. You can even have Wallet follow your location to let it show the most suitable card depending on where you are; for example, a Starbucks card when you are near a Starbucks outlet.



100%



9:41 AM

100%

PLATINUM DEBIT CARD



Apple iTunes

BALANCE \$37.43

spg Starwood Preferred Guest

Platinum

Walgreens

American oneworld

GATE 7 FLIGHT AA59

LA vs SF



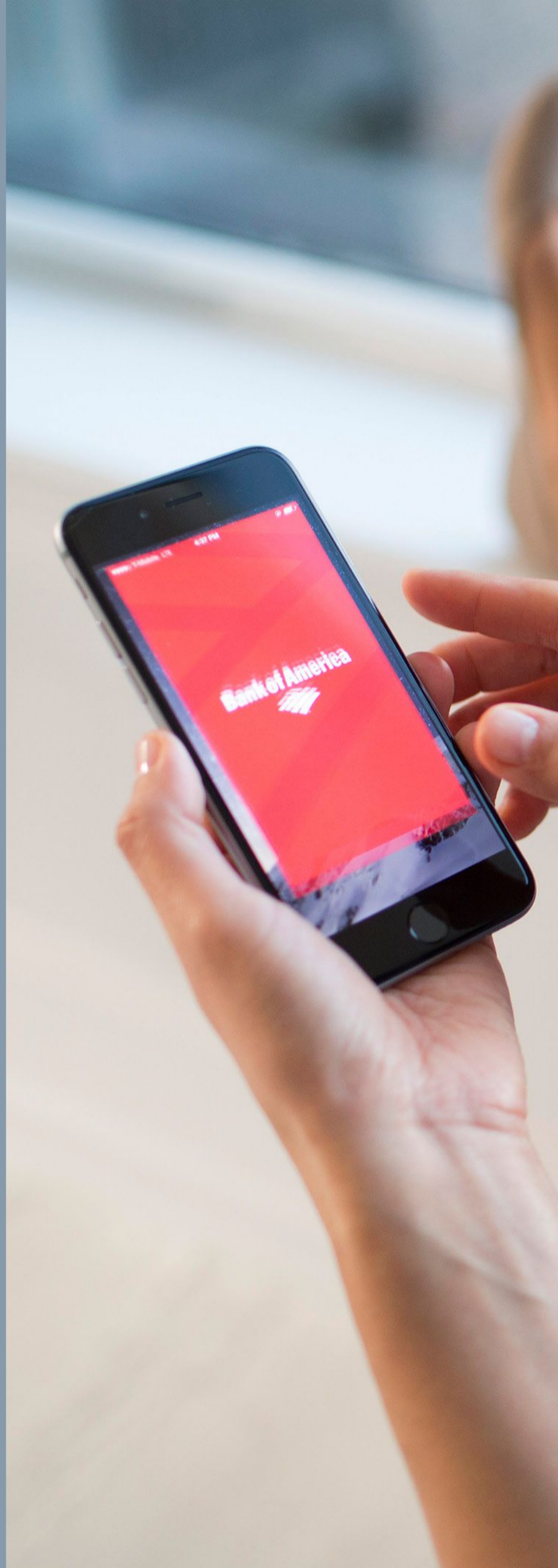
7:15PM September 12

## YOU CAN BANK ON GREAT EXPERIENCES WITH THESE APPS

When logging into your bank account, have you ever thought to yourself that there must be a better method of doing it than typing a password? Over a decade ago, **Tangerine Bank, then named ING Direct Canada, thought the same thing.** It assisted with the development of a mouse featuring a built-in thumbprint scanner – but while the technology worked, the experience was too complex for many users to get to grips with, and the project never got past the pilot stage.

Fast forward to 2014 and, with Apple having allowed apps to make use of the Touch ID fingerprint scanner on iPhones and iPads, Tangerine took advantage. Many other banks have done the same, including Bank of America and U.S. Bank and in the United Kingdom, HSBC. However, this integration of Touch ID functionality is only one way in which mobile banking apps are helping customers to really smooth their experiences of banking on the move.

Looking at the banks we have just mentioned, **Bank of America's iPhone app** includes an accompanying Apple Watch app letting you check such details as your current balance, payment due and transactions from your wrist. Meanwhile, **HSBC offers iPhone and iPad versions of its mobile banking app**, which protects data through the use of 128-bit SSL encryption technology. Finally, of course, we can't forget that trailblazer Tangerine Bank, which **lets its customers review transactions, locate ABMs and receive vital notifications with its iOS app.** Tangerine also offers an Apple Watch app.





**#09 – Bank of America - Mobile Banking**

By Bank of America

Category: Finance

Requires iOS 8.0 or later. Compatible with iPhone, iPad, and iPod touch.



**#10 – HSBC Mobile Banking**

By HSBC

Category: Finance

Requires iOS 8.0 or later. Compatible with iPhone, iPad, and iPod touch.

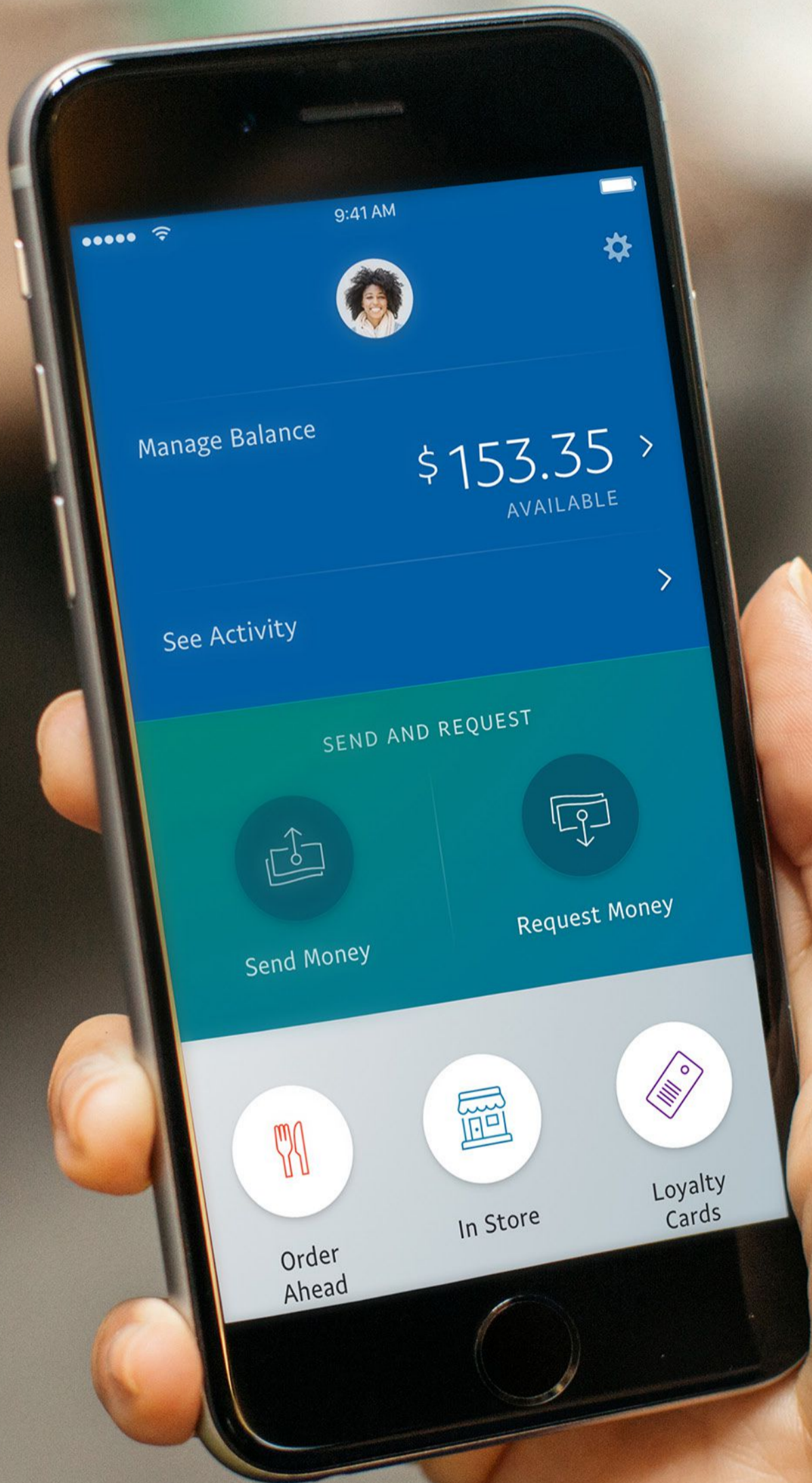


**#11 – Tangerine Mobile Banking**

By Tangerine Bank / Banque Tangerine

Category: Finance

Requires iOS 8.0 or later. Compatible with iPhone, iPad, and iPod touch.





## #12 – PayPal

By PayPal, Inc.

Category: Finance

Requires iOS 8.1 or later. Compatible with iPhone, iPad, and iPod touch.

### YOU CAN EASILY PAY A PAL WITH PAYPAL

While **the PayPal app has long been wonderfully convenient on iOS**, it recently became even more enjoyable to use. That's because PayPal has, just this month, reacted to one of Apple's biggest moves with iOS 10: opening up Siri to integration with third party apps. Yes, it's now possible for PayPal payments to be sent and requested through Siri, which means that, with an iPhone or iPad running iOS 10, you can now bark voice commands like "Hey Siri, send Michael \$25 using PayPal". The service **explains more about this freshly-added functionality on its website**.

With so many developers of mobile banking apps having enthusiastically embraced Touch ID, it seems to be only a matter of time before we see their extensive use of the expanded Siri functionality. This bodes well for all of our financial futures. After all, as this article has made clear, there are already many ways in which we can access and check our financial details on our various devices. So as Siri increasingly enters the picture, it should become even easier for us to spot, in these details, big holes before they develop into seriously costly problems.

by Benjamin Kerry & Gavin Lenaghan




**ecovative**  
We grow materials.

# MycoBoard

**Density: 45 lb/ft<sup>3</sup>**  
**Screw Hold: 122 lbF**  
**MoE: 475,000 psi**  
**MoR: 2201 psi**  
**IB: 84 psi**





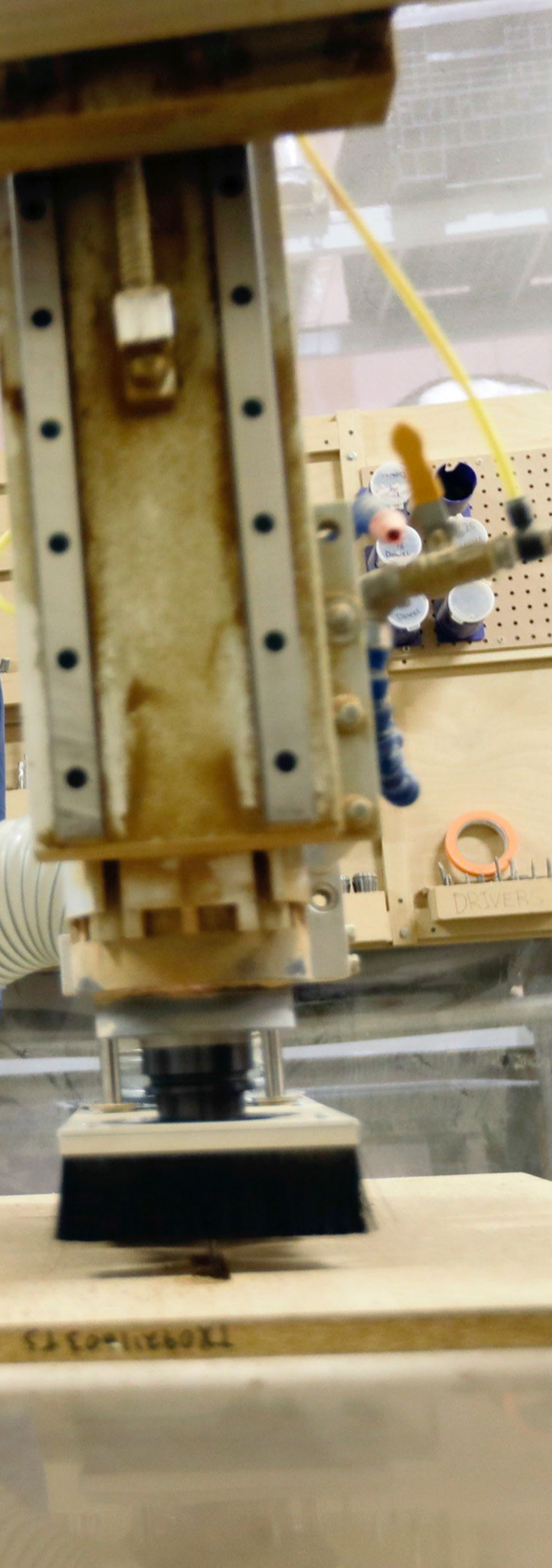
# TOADSTOOL FOOTSTOOLS: ARE ORGANISMS MANUFACTURING'S FUTURE?

The sturdy stools and spongy cushions made at a factory in upstate New York are formed with fungus.

Ecovative Design is a business staking its growth on mycelium, the thread-like “roots” of mushrooms. The mycelium grows around small pieces of stalks and stems to create a bound-together material that can be molded into soft packaging for glassware or pressed into the boards used for the footstools they recently began selling.



Image: Mike Groll



“It’s like growing a tree in the shape of your furniture,” said Ecovative co-founder Gavin McIntyre. “But rather than a tree, we’re using mushrooms.”

The simple stools are organic markers in ambitious efforts by researchers worldwide to commercially grow fungi, bacteria and proteins into clothing and building materials. Proponents see micro-organisms as factories of the future, displacing energy-intensive manufacturing with more sustainable models.

While the young grow-it-all field is still more about promise than actual products, companies are working on making bricks without kilns, leather without cows and silk without spiders.

McIntyre rapped his knuckles on one of their “myco-boards,” which look and feel similar to the particle boards that are commonplace in cabinets and big-box store furniture. He was on the floor of Ecovative’s hangar-like facility north of Albany where chopped-up farm stuff is steamed and bagged up with mycelium.

Stacked on high-rise racks, the minuscule white mycelium threads feed on the stalks and woody bits, binding it together. After a week or so, the big clear plastic bags look little like giant pieces of frosted shredded wheat.

“The fungus is literally self-assembling,” McIntyre said.

McIntyre and Ecovative co-founder Eben Bayer have been harnessing mushroom power since they were Rensselaer Polytechnic Institute students growing fungus under their beds for a class project a decade ago. Today, they employ about 90 people in a business that found initial

success selling a compostable alternative to plastic foams used for packaging items like computers and glass bottles.

But Bayer and McIntyre always believed mycelium to be more multifaceted. They figured out a way to create boards by adding heat and pressure and how to make flexible cushions. They sell boards to home furniture makers and recently started offering for sale their own grown-for-home items, like the \$199 Imperial Stool.

They see their mushroom boards as a formaldehyde-free alternative to composite wood products and are working with outside mills to ramp up production.

As Ecovative makes boards, bioMASON in Research Triangle Park, North Carolina, grows bricks from sand, water, bacteria and some nutrients.

The bricks stiffen over several days with the formation of calcium carbonate between the grains of sand, mimicking the process that makes coral reefs sturdy. The company's bricks have been used to pave a pair of courtyards in San Francisco, and it is working with builders and pavers who could make their bricks on site.

"Traditional brick manufacturing is quite energy intensive, as well as concrete," said company founder Ginger Krieg Dosier.

Bricks and boards created from living organisms are sometimes called "biofabricated" products. An annual "Biofabricate" conference to be held Thursday in New York will feature speakers involved in efforts from everything to growing human tissue into ears to growing leather.





One conference participant, Tsuruoka, Japan-based Spiber, last year was involved in the unveiling of a prototype of North Face-branded “Moon Parka,” made with synthetic spider silk fibers. Plans to sell the parka in Japan have been delayed as they improve production.

While many industries see growth potential in growing materials, there are still open questions on whether they will be better than current manufacturing techniques, said Andrew Pelling, of the University of Ottawa.

Pelling, who runs a biophysical manipulation lab, has done work growing human ear cells using the cellulose from apples as a sort of scaffolding. He sees a lot of promise and interest from an array of industries, but he also believes there is a long road ahead for more sophisticated grown products.

“We’re living in a biological stone age now,” he said. “I think we shouldn’t underestimate how much complexity there is in biology and I think there are still a lot of mysteries to figure out before we have real full control to dial in anything you want to grow or make or repair,” Pelling said. “And for me, that’s the exciting part.”











# GET READY TO BUILD! HANDS-ON TOYS THAT TEACH ARE HOT

Toys that teach aren't a new thing, but a growing number are calling for kids to build with blocks, circuits or everyday items before reaching for a tablet screen.

Play is how kids learn about the world around them, whether it's a toddler throwing a ball or teens playing video games. It's about seeing how things work and what happens when they do something. And over the years, toys have gotten more high tech to keep screen-obsessed children engaged with such play.

But there's growing worry among parents and educators that toys are moving too far in that direction. Educational toys that have a math and science bent - marketed under the umbrella of STEM - are now trying to get back to the basics: less screen time, more hands-on activities.

"When kids use their hands, your outcomes are much higher," said Pramod Sharma, CEO of one such toy company, Osmo. "It's very different than if they're just staring at a screen watching TV."

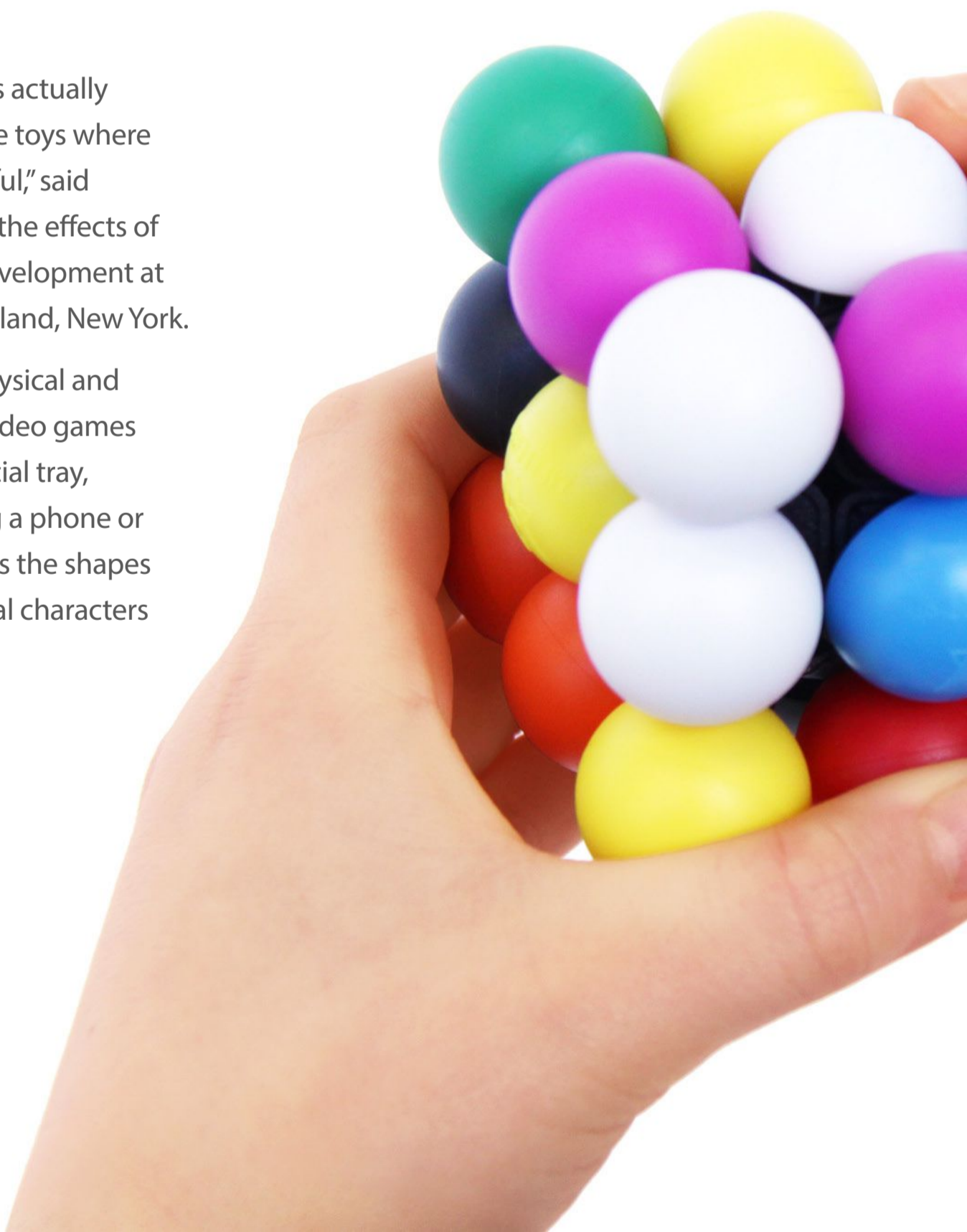
With Osmo, kids learn everything from spelling to coding not by touching a screen, but by snapping together magnetic blocks. A screen is still part of it; an image is beamed onto an iPad through its camera. But the idea is to have kids learn first with their hands, then see their creation move to the screen.

## LEARN BY BUILDING

Educators agree that whether you're talking about a toddler playing with blocks, or a teen building a computer from scratch, the act of putting something together helps educational concepts sink in.

"The way the world comes to us is actually through tactile activities, so tactile toys where we build stuff are incredible helpful," said Karen Sobel-Lojeski, who studies the effects of technology on children's brain development at Stony Brook University on Long Island, New York.

Bloxels attempts to bridge the physical and the digital. Kids build their own video games by putting plastic blocks in a special tray, instead of writing out code. Using a phone or tablet's camera, an app transforms the shapes created with the blocks into digital characters and scenery.





Makey Makey, a startup founded by a pair of MIT students, asks kids to come up with their own electronic creations by combining software, circuits and everyday items like bananas and doughnuts.

### **GOOD, BUT POPULAR?**

Sobel-Lojeski said toys are most educational when kids can learn how things work by building. But Juli Lennett, a toy industry analyst at NPD, said such toys are rarely on kids' wish lists.

On the other hand, tech toys that have subtle educational value, but aren't specifically marketed as such, can be strong sellers. Lennett cites Fisher-Price's Think & Learn Code-a-Pillar, which introduces basic coding concepts by letting preschoolers assemble segments that each tells the caterpillar to do something different, such as "turn left" or "play sound."





"I'm not sure that kids are asking for it, or that their parents just want their kids to go to Harvard, but it's definitely one of the top-selling toys this holiday," Lennett said.

Tracy Achinger, a former automotive engineer in Shelby Township, Michigan, said her 8-year-old son got interested in coding after starting computer programming classes this year. So for Christmas, she's buying him an Ozobot, a golf ball-sized robot that kids can program by drawing different colored lines or using a kid-friendly, block-based programming language.

### **TECH HAS ITS LIMITS**

Achinger's 3-year-old son will be getting an iPad this year. She said she isn't against screen time, but believes parents need to keep an eye on what their kids are watching and playing. She said her older son has been playing creative games such as "Minecraft" for a few years.

"We try to keep it educational," Achinger said. "I really think those kinds of games get their imaginations going as they create their own worlds."

The American Academy of Pediatrics recently revised its guidelines to shift the emphasis away from banning screen time and toward balancing high-quality content with non-screen activities.

That doesn't mean every toy with a screen is educational. Barbie has her own smart home in the form of the voice-activated and Wi-Fi-connected Hello Dreamhouse. And new versions of Elmo, Furby and the Cabbage Patch Kids have apps, which Lennett said are often more about branding than learning.





Sobel-Lojeski said slapping an app on a previously low-tech toy can backfire. Instead of letting the child imagine how a particular toy would talk or behave, the app fills in those holes.

“It cuts the child off from play that is much more important for development,” she said.

Some of the drive for tech in toys comes from parents who believe that the younger their kids are exposed to technology, the more prepared they will be for a lucrative career someday.

But Sobel-Lojeski said Albert Einstein came up with breakthroughs without ever touching a computer, let alone tech toys at a young age.

“We can easily be tricked into thinking that all this stuff is going to make our kids more intelligent or better scientists and that’s just not true,” she said.

## **RESIST THE SCREEN**

Companies that make computers for kids also see the value in a construction element.

Kano shows kids how to build their own computers in a kid-friendly storybook format.

Kano co-founder Alex Klein said he had to resist suggestions to just put Kano into app form and skip the computer construction all together.

He said the act of building a computer was key because it “created a huge sense of energy and momentum for what followed on screen.”

But Klein said screens aren’t going away anytime soon.

“You can’t compete with screens with kids,” he said. “So, for us it’s not about trying to push against what this next generation thinks is good or likes. It’s about providing a new angle on it that’s more creative.”







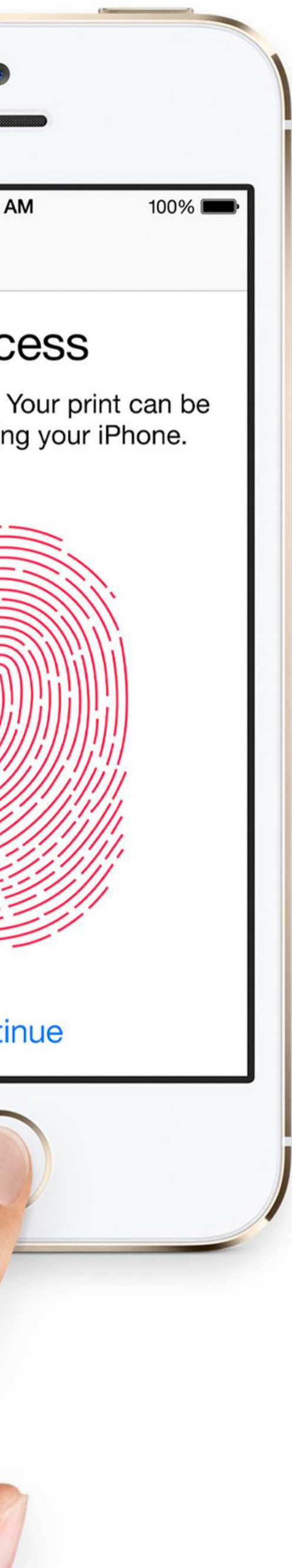
# WHY FINGERS MAKE HANDY, IF NOT FOOLPROOF, DIGITAL KEYS

It sounds like a great idea: Forget passwords, and instead lock your phone or computer with your fingerprint. It's a convenient form of security - though it's also perhaps not as safe as you'd think.

In their rush to do away with problematic passwords, Apple, Microsoft and other tech companies are nudging consumers to use their own fingerprints, faces and eyes as digital keys. Smartphones and other devices increasingly feature scanners that can verify your identity via these "biometric" signatures in order to unlock a gadget, sign into web accounts and authorize electronic payments.

But there are drawbacks: Hackers could still steal your fingerprint - or its digital representation.





Police may have broader legal powers to make you unlock your phone. And so-called “biometric” systems are so convenient they could lull users into a false sense of security.

“We may expect too much from biometrics. No security systems are perfect,” said Anil Jain, a computer science professor at Michigan State University who helped police unlock a smartphone by using a digitally enhanced ink copy of the owner’s fingerprints.

### **BYPASSING THE PASSWORD**

Biometric security seems like a natural solution to well-known problems with passwords. Far too many people choose weak and easily-guessed passwords like “123456” or “password.” Many others reuse a single password across online accounts, all of which could be hacked if the password is compromised. And of course some use no password at all when they can get away with it, as many phones allow.

As electronic sensors and microprocessors have grown cheaper and more powerful, gadget makers have started adding biometric sensors to familiar products.

Apple’s iPhone 5S, launched in 2013, introduced fingerprint scanners to a mass audience, and rival phone makers quickly followed suit. Microsoft built biometric capabilities into the latest version of its Windows 10 software, so you can unlock your PC by briefly looking at the screen. Samsung is now touting an iris-scanning system in its latest Galaxy Note devices.

All those systems are based on the notion that each user’s fingerprint - or face, or iris - is unique. But that doesn’t mean they can’t be reproduced.

## LIFTING PRINTS, FAKING FACES

Jain, the Michigan State researcher, proved that earlier this year when a local police department asked for help unlocking a fingerprint-protected Samsung phone. The phone's owner was dead, but police had the owner's fingerprints on file. Jain and two associates made a digital copy of the prints, enhanced them and then printed them out with special ink that mimics the conductive properties of human skin.

"We tried the right thumb and it worked right away," Jain said.

Researchers at the University of North Carolina, meanwhile, fooled some commercial face-detection systems by using photos they found on the social media accounts of test subjects. They used the photos to create a three-dimensional image, enhanced with virtual reality algorithms. The spoof didn't work every time, and the researchers found it could be foiled by cameras with infrared sensors. (The Microsoft face-recognition system uses infrared-capable cameras for extra precision.)

But some experts believe any biometric system can be cracked with sufficient determination. All it takes are simulated images of a person's fingerprint, face or even iris pattern. And if someone manages that, you can't exactly change your fingerprint or facial features as you would a stolen password.

To make such theft more difficult, biometric-equipped phones and computers typically encrypt fingerprints and similar data and store them locally, not in the "cloud" where hackers might lift them from company servers. But many biometrics can be found elsewhere.





You might easily leave your fingerprint on a drinking glass, for instance. Or it might be stored in a different database; Jain pointed to the 2015 computer breach at federal Office of Personnel Management, which compromised the files - including fingerprints - of millions of federal employees.

## COMPELLED TO UNLOCK

Most crooks won't go to that much trouble. But some experts have voiced a different concern - that biometrics could undermine important legal rights.

U.S. courts have ruled that authorities can't legally require individuals to give up their passwords, since the Fifth Amendment says you can't be forced to testify or provide incriminating information against yourself. In the last two years, however, judges in Virginia and Texas have ordered individuals to unlock their phones with their fingerprints.

There's a legal distinction between something you know, like a password, and something you possess, like a physical key or a fingerprint, said Marcia Hofmann, a San Francisco attorney who specializes in privacy and computer security. While you can't be forced to reveal the combination of a safe, she noted, the Supreme Court has said you can be required to turn over a physical key to unlock a door.

"Getting your thumb print or iris scan is not the same as making you speak," agreed Orin Kerr, a law professor at George Washington University. "In practice it's another way of getting access to the computer, but through a very different means."









SEARCHING

The issue hasn't been tested yet in higher courts, though it's likely just a matter of time.

Even with vulnerabilities, some analysts say the convenience of biometric locks is a plus - not least because it may give the password-averse another easy option to secure their devices. "It's bringing secure authentication to the masses," said Joseph Lorenzo Hall, a tech policy expert at the nonprofit Center for Democracy and Technology.

Others say the best approach would combine biometric systems with other protections, such as a strong password or PIN.

"It's good to see biometrics being used more, because it adds another factor for security," said Jain. "But using multiple security measures is the best defense."

# HOW A TRUMP ADMINISTRATION COULD SHAPE THE INTERNET


Under a President Donald Trump, cable and phone companies could gain new power to influence what you do and what you watch online - not to mention how much privacy you have while you're at it.

Republicans who generally oppose regulation seem likely to take charge at the Federal Communications Commission, the government's primary telecom regulator. That alone could mean the end of rules designed to protect privacy and individual choice on the internet. Those rules were enacted over the past several years under the Obama administration.

Under Trump, "the FCC will be a lot more focused on getting government out of the way," said Berin Szoka, president of TechFreedom, a think tank that opposes much regulation. Phone and cable companies routinely protest that regulation lead them to invest less in their networks, harming their ability to deliver better service.







Deregulation raises concerns for consumer advocates - not just in terms of rolling back rules, but also potentially allowing more huge mergers, which several analysts expect despite Trump's campaign swipes at big media . Under the coming administration, a laxer FCC could result in even higher cable and internet bills, worse customer service and fewer choices, says Harold Feld, senior vice president at public-interest group Public Knowledge.

Of course, it's difficult to know exactly what to expect, given Trump's aversion to policy specifics and frequent reversals during the campaign. Representatives for Trump's transition team didn't reply to requests for comment.

## **NET NEUTRALITY**

One possible first target: Rules that aim to protect individual choice and innovation on the internet.

Suppose that firing up Netflix or YouTube led only to delays and stuttering playback that still counted against the limited data in your broadband plan - a sharp contrast to the speedy video app offered by your phone or cable company, which incurs no data costs. That's one scenario the Obama-era FCC sought to ward off with "net neutrality" regulation that requires internet providers to treat all data traffic equally on their networks, as the internet has historically worked.

Without net neutrality, your access to many popular services might be degraded by your local cable or phone company. Startups could have trouble delivering new video or virtual-reality services. Companies that provide



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internet service could find it easier to push their own options instead.

The net-neutrality rules are popular, so they're not likely to completely disappear under Trump. But the FCC might well be more restrained in enforcing them.

Internet providers could use subtle tactics and behind-the-scenes maneuvers to change people's behavior and make more money, suggested Matt Wood, policy director at the public-interest group Free Press. Consumers might eventually find that they have fewer services to choose from online, or that using them is more difficult or expensive.

## **PRIVACY, OPENNESS AND INTERNET ACCESS**

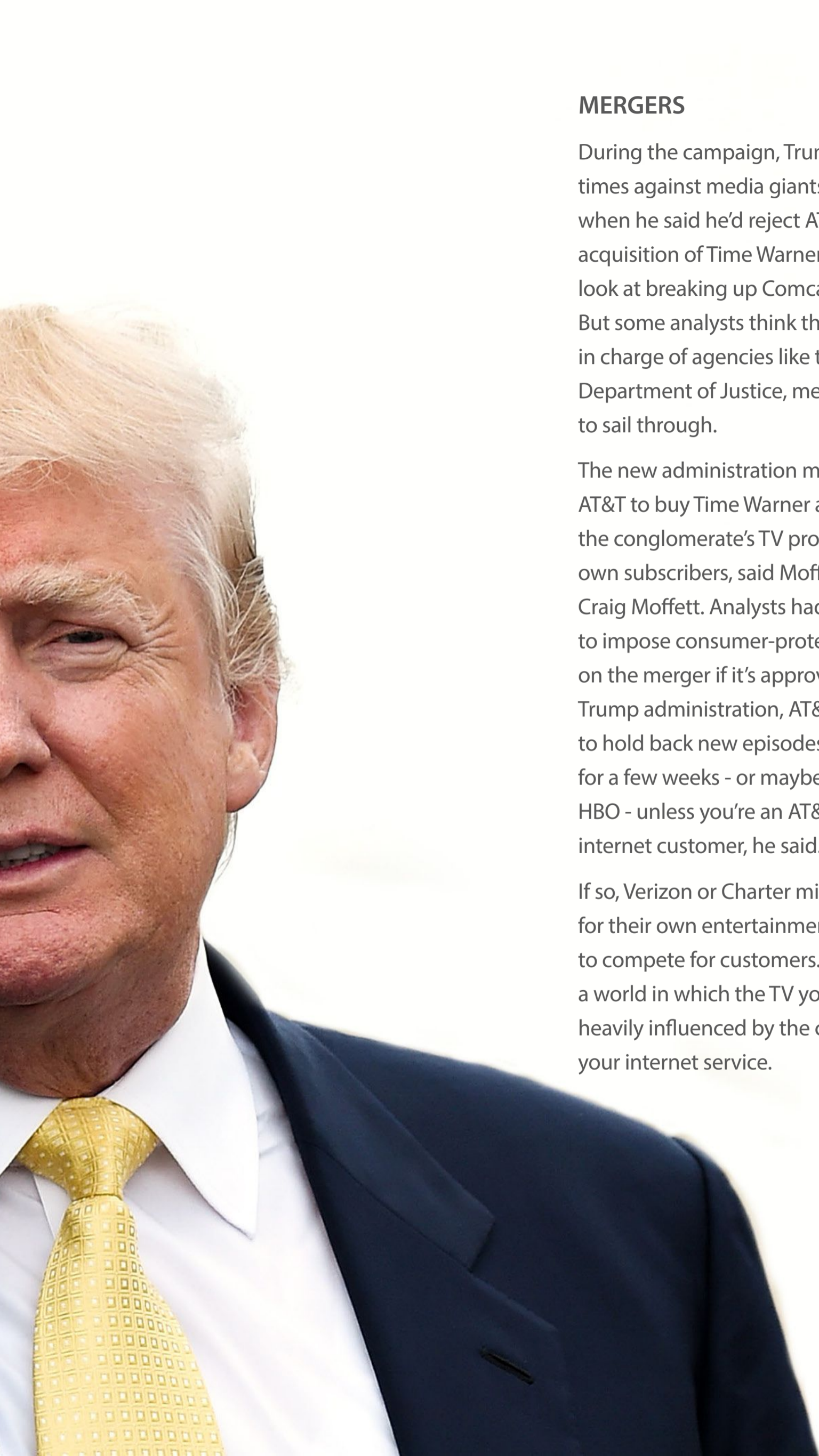
If the Trump FCC whacks away at existing regulations, cable and phone companies are going to find it a lot easier to mine your browsing habits and other information for data they can use to target ads at you.

Verizon, for example, is eager to build a digital-ad business to compete with Google and Facebook. But recent privacy rules force them to ask customers for permission before using their data. Those companies have made no secret of their dislike for this requirement.

The FCC's effort to "open up" the cable box in ways designed to give you more options for hooking up TVs and streaming gadgets to cable service is likely dead. Its effort to subsidize internet for low-income people may face budget cuts, although cable companies do offer separate cheap internet options for low-income people.







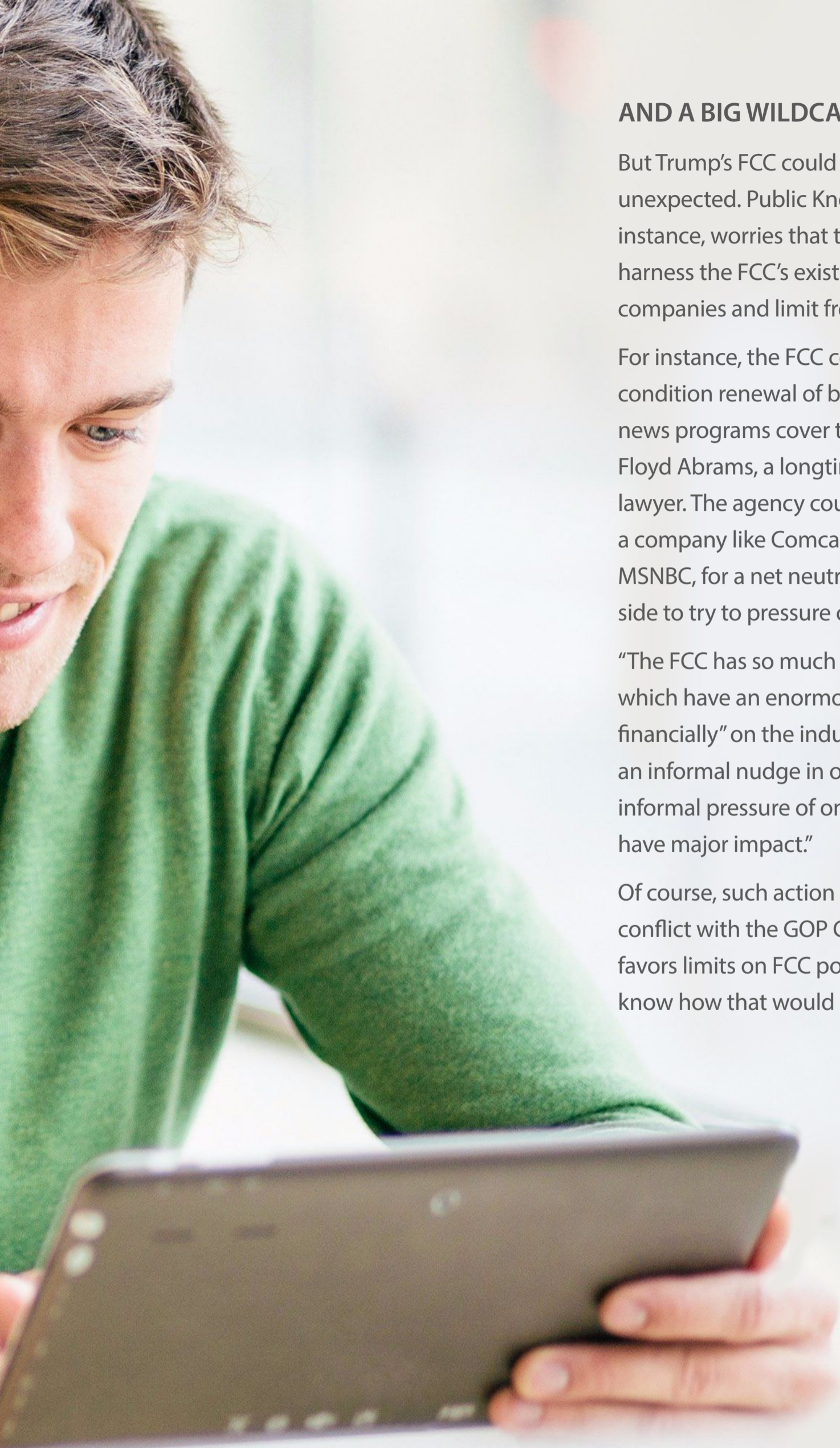
## MERGERS

During the campaign, Trump spoke out several times against media giants, in particular when he said he'd reject AT&T's \$85.4 billion acquisition of Time Warner and that he might look at breaking up Comcast and NBCUniversal. But some analysts think that with Republicans in charge of agencies like the FCC and the Department of Justice, mergers are more likely to sail through.

The new administration might make it easier for AT&T to buy Time Warner and reserve some of the conglomerate's TV programs and films for its own subscribers, said MoffettNathanson analyst Craig Moffett. Analysts had expected regulators to impose consumer-protection conditions on the merger if it's approved. But under the Trump administration, AT&T might remain free to hold back new episodes of "Game of Thrones" for a few weeks - or maybe even everything on HBO - unless you're an AT&T cellphone or home internet customer, he said.

If so, Verizon or Charter might go shopping for their own entertainment conglomerates to compete for customers. That could create a world in which the TV you watch would be heavily influenced by the company that supplies your internet service.





## AND A BIG WILDCARD

But Trump's FCC could also do something unexpected. Public Knowledge's Feld, for instance, worries that the administration could harness the FCC's existing tools to police media companies and limit freedom of the press.

For instance, the FCC could threaten to condition renewal of broadcast licenses on how news programs cover the administration, said Floyd Abrams, a longtime First Amendment lawyer. The agency could threaten to go after a company like Comcast, which owns NBC and MSNBC, for a net neutrality violation on its cable side to try to pressure coverage.

"The FCC has so much authority over policies which have an enormous and direct impact financially" on the industry, Abrams said. "Even an informal nudge in one direction or another, informal pressure of one sort or another, can have major impact."

Of course, such action could bring Trump into conflict with the GOP Congress, which generally favors limits on FCC power. But there's no way to know how that would play out at this stage.





# SCIENTISTS DEVELOP ROBOTIC HAND FOR PEOPLE WITH QUADRIPLEGIA

Scientists have developed a mind-controlled robotic hand that allows people with certain types of spinal injuries to perform everyday tasks such as using a fork or drinking from a cup.

The low-cost device was tested in Spain on six people with quadriplegia affecting their ability to grasp or manipulate objects.

By wearing a cap that measures electric brain activity and eye movement the users were able to send signals to a tablet computer that controlled the glove-like device attached to their hand.

Participants in the small-scale study were able to perform daily activities better with the robotic hand than without, according to results **published in the journal Science Robotics.**

The principle of using brain-controlled robotic aids to assist people with quadriplegia isn't new. But many existing systems require implants, which can cause health problems, or use wet gel to transmit signals from the scalp to the electrodes. The gel needs to be washed out of the user's hair afterward, making it impractical in daily life.

“The participants, who had previously expressed difficulty in performing everyday tasks without assistance, rated the system as reliable and practical, and did not indicate any discomfort during or after use,” the researchers said.

It took participants just 10 minutes to learn how to use the system before they were able to carry out tasks such as picking up potato chips or signing a document.

According to Surjo R. Soekadar, a neuroscientist at the University Hospital Tuebingen in Germany and lead author of the study, participants represented typical people with high spinal cord injuries, meaning they were able to move their shoulders but not their fingers.

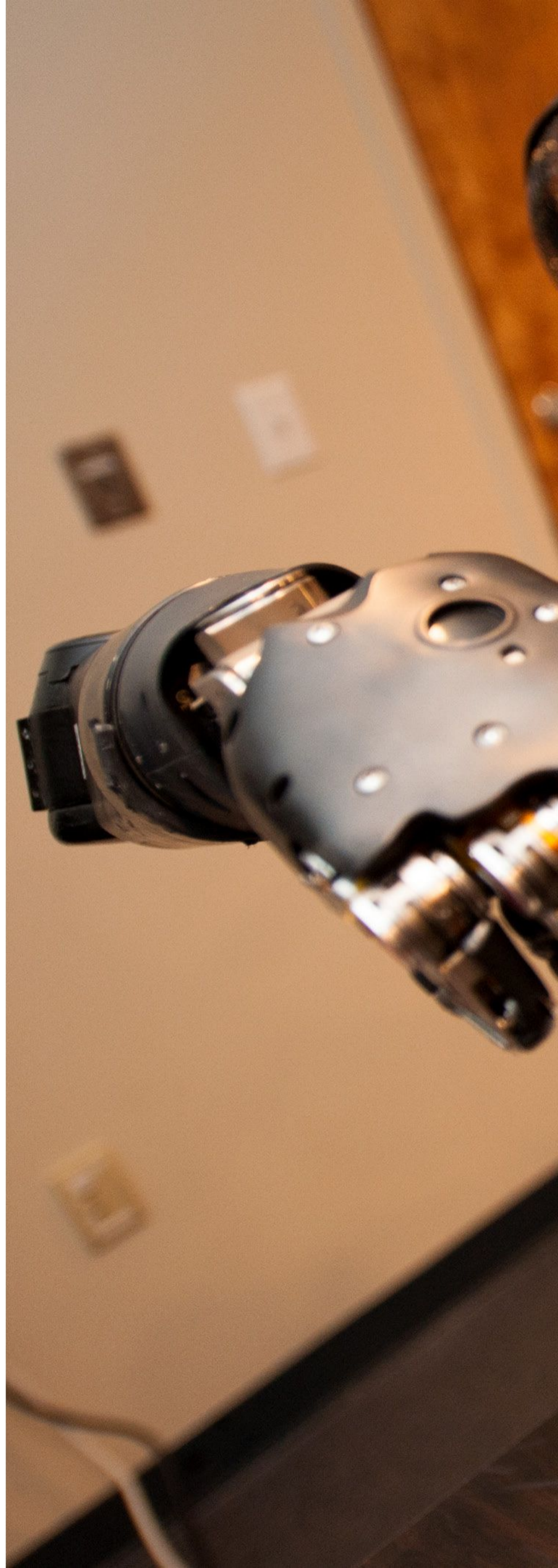
There were some limitations to the system, though. Users had to have sufficient function in their shoulder and arm to reach out with the robotic hand. And mounting the system required another person’s help.

Jan Schwab, an expert on spinal cord injury at Berlin’s Charite hospital who wasn’t involved in the research, called it an interesting pilot study that needs to be followed up with further clinical tests.

“Bigger studies will be very important to find out which patients respond well, less well or not at all,” Schwab said.

Soekadar said the system could be brought to market within two years at a cost of between 5,000 and 10,000 euros (\$5,370 to \$10,740), depending on functionality.

The device could also be used to help re-train the brain of stroke patients undergoing rehabilitation, he said.









# STREAMING SPORTS GETS EASIER AS NFL COMES TO CBS ALL ACCESS



CBS says NFL games are coming to its CBS All Access subscription service, making it a little easier for “cord cutters” to watch football without a pricey cable subscription.

The ability to easily watch live sports is one of most important reasons people pay for traditional cable bundles. NFL games are already streamed live , but in many cases still require a satellite or cable TV subscription.

Games aired on CBS will be available for streaming on tablets, to TVs and on cbs.com, if customers live in one of the 150 markets where the CBS All Access app comes with a live CBS feed. The games aren't available on CBS' phone app, as those mobile rights are exclusive to Verizon.

The multiyear deal includes regular, preseason and postseason games shown on CBS. Thursday night games will become available next year - CBS' allotment is finished for this season - and so will the Super Bowl when CBS has it again in 2019.

CBS All Access costs \$6 a month, or \$10 for a version with fewer ads. It also has episodes of CBS shows, some classic TV like “Cheers” and “Frasier,” and a handful of original shows.





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