VOL. 01

REVIEW YEAR IN



ETHICS IN LOCATION TECH [PG 22]

SECRET TRUTHS OF 2019 [PG 07]

FOURSQUARE ACQUIRES PLACED [PG 07]

POWERED BY FOURSQUARE

2019

### **FOURSQUARE**



### **Foursquare** CEO, David Shim,

What Foursquare thinks about as we build out our location platform and bring forth the location transformation.

### 06

Welcome to the American Dream 2020 The future of retail is massive.

### Two execs on the acquisition, integration, and our future.

of 2019 What top analytics insights reveal about our collective behavior.

Inc.'s Placed

Wild

brands with the best consumer loyalty—and reveal what turned their fans into loyalists.

# Is Out in the

**How Pilgrim SDK** is making bars better across the country.

### What We've **Learned About**

We uncover the

### Tech & Awards

What do the NHL, deer, and dark spirits have in common? Hint: a winning combo.

### Powered by People

Our global Superusers spill the beans on their most interesting discoveries.

### The Future of **B2B Marketing**

The biggest trends of 2020 and beyond-compiled from hundreds of marketers.

### THE FAMOUS KITCHEN TABLE

Foursquare co-founder Dennis Crowley says goodbye to the kitchen table where it all began.

### WHY LOCATION **TECHNOLOGY CAN CHANGE THE WORLD**

Here's how technology is making our world safer, stronger, and more equitable.

### **CREATING A** SENSE OF PLACE

Hilton city guides reveal what will be big in 2020 in Tokyo, Puerto Rico and New York.

### THE FUTURE OF ETHICS IN TECH

Tech ethicist David Ryan Polgar explains the Global Ethics Principles and why they matter now more than ever.

### **MIRRORWORLD**

Mirrorworld is coming. Why do we care?

### A DECADE IN **TECHNOLOGY** 2009-2019

We collected some of the biggest, most impactful moments from technology from the past 10 years and asked a variety of people what's changed us the most.

# YEAR IN REVIEW



### FOURSQUARE CEO, DAVID SHIM, ON THE COMING LOCATION TRANSFORMATION

### AT FOURSQUARE, WE BELIEVE IN THE POWER OF

location. Location is reinventing how companies—from start-ups to the world's most demanding, global brands—engage with consumers and connect with human movement.

This end-of-year magazine, a capstone to our 10th anniversary year, is intended to capture our broader perspective on a mobile-first world where every industry is being upended. Foursquare today makes location technology accessible and actionable. We have built a set of tools and products that are simple enough for any client to use, yet robust enough to power the coming location transformations in every vertical and across every geography, and to make consumer experiences more personal, relevant and timely than ever.

2019 was a pivotal year for Foursquare. I've described it as building the 100 Club: a record \$100 million+ in revenue, \$100 million+ in new investments, reaching a 100 million+ points of interest and 100 million+ devices measured on a monthly basis. We celebrated our 10th anniversary by being named Innovator of the Year in the location industry by Street Fight magazine. Foursquare's future is as bright as it's ever been, and I am thrilled to be its CEO.

The last year also included much more. Foursquare acquired Placed, of which I am the founder, and successfully integrated a joint measurement solution (page 7). We launched the second iteration of our Foursquare For Good competition (page 14) and named our new winners. We made big updates to our Pilgrim SDK (page 8). Foursquare Labs introduced audio Marsbot (page 31).

We also announced new offerings that serve agencies, publishers, ad tech and data marketplaces (page 10). All of this is part of a cumulative shift to a world where the physical is mirrored in the digital (page 26). In the end, this magazine was constructed to be entertaining, not commercial. Please enjoy this beautiful publication, with stories that uncover what's happening around us in this new world that seamlessly mixes digital and real-world engagements.

This behind-the-scenes approach is not dissimilar to how our location technology platform acts in reality: it's the location layer of digital experiences for billions of consumers via our partners, from advertising to consumer experiences. We are proud to be the undisputed

independent global leader. Every day, we are earning the right to tackle new industries and challenges. We do this as a committed partner to Fortune 500 companies and 150,000 registered developers, always with a sense of ethics and a promise to consumers to earn their trust (see page 22).

So, as 2019 comes to a close, and with it our 10th anniversary year, I want to give thanks to the pioneers who have built this company from a small-but-mighty start-up developed at the Famous Kitchen Table (page 12), and to those working with us now in each and every capacity.

Wishing everyone a tremendous 2020.

DAVID SHIM

CEO, FOURSQUARE



WiFi and other critical signals are key components of Foursquare's latest nall-mode capability

NEWS BITS

### **WELCOME TO** THE AMERICAN **DREAM 2020**

The future of retail is massive

06

### FOR ANYONE THAT STILL DOUBTS THE POWER

of brick-and-mortar retail shopping, the American Dream mega-mall set to open in New Jersey's Meadowlands Complex in 2020 aims to set the record straight: IRL shopping is here to stay, and it's bigger than ever—literally.

The 3-million-square-foot complex will boast a mix of 45% retail outposts and 55% entertainment facilities, including Big Snow, North America's only indoor ski and snowboard mountain and chalet, 16 acres of amusement rides, the Nickelodeon Universe theme park, the DreamWorks water park, a glass sunroof for sunbathing, an NHL-sized ice rink, a mini golf course, Legoland, an aquarium, a luxury movie theater and—to be comprehensive—a bunny ranch and aviary. Should that prove not to be exhaustive, retailers like Saks, Century 21, Tiffany & Co., Hermès and over a hundred dining options, including the Coca-Cola Dining Hall, will all vie for visitors' attention.

As massive retail projects like the American Dream and others spring up across the country, developers seem to be relying more and more on entertainment features to draw crowds into physical stores. "Offline commerce is about the experience of our day-to-day interactions and how we connect with one another,"

explained Nathalie Hwang, managing partner and head of Simon Ventures (the venture fund sponsored by Simon Property Group, and an investor in Foursquare). "Retailers need to focus more than ever on creating highly focused and impactful store identities to leverage physical retail as an effective vehicle for fostering relationships in the digital age."

Only time will tell if features like a bunny ranch or indoor ski chalet are the kind of entertainment experiences that will draw the masses to the American Dream. Meanwhile, developers will be measuring the impact of these experiential concepts just as closely as the retailers themselves will be measuring ad spend within this shopping mecca and others. After 15 years in development, everyone's excited to see this dream become a reality.

To learn more about Foursquare's Mall Mode, how it accurately understands how people move through a mall, and how it helps marketers measure visits to locations in dense areas, click here. For our take on "Surviving the Retail Apocalypse," click here.

### **Fantasy Foursquare**

"Imagine if the Untappd app served up beer menus to users the moment they walk into any of nearly 20,000 bars, restaurants and breweries around the world."

-GREG AVOLA, CO-FOUNDER AND CTO AT UNTAPPED, WHEN ASKED FOR HIS DREAM USE CASE FOR PILGRIM SDK

# FOURSQUARE **ACQUIRES**

Two execs comment on the integration, six months later



"I've been through many large integrations that bring systems

together. These things are like a home renovation: double the estimate and double the time. So, the fact that we brought to market a unified product in 90 days is insane. Our competitors all said, it won't happen, they'll be distracted. To show up 90 days later, and deliver on the core proposition, that's just really impressive."

JOSH COHEN, SVP PRODUCT, FOURSQUARE



"What's been most astonishing is how new products are falling

into place. We're able to develop things faster. A new self-service feature rolled out just days after we hit our 90-day checkpoint, and we now offer daily reporting. It's a stacking effect: clients log in more frequently, they optimize campaigns and we're eliminating more friction points. The product is automated and actionable at a granular level."

DAVID SHIM, CEO, FOURSQUARE

### **REVEALING SECRET TRUTHS OF 2019**

Our top analytics insights and what they say about our collective behavior

January sees people sticking to

Visits to **gyms** and **bookstores** spike while visits to dessert shops fall.

> Beaches saw a +270% lift in visits on the

as compared to the same day

three weeks prior.

The day we change the clock for

saw a 51% increase in visits to bars. Extra time = more booze. On the second Saturday in February, visits to

FAST FOOD

restaurants are back up again by **4.6%**.

We saw a spike in visits to certain retail categories on

Flower shops +36%, chocolate shops +59%, lingerie stores +32%

Visits to

increased on super hot days in the winter and spring, and decreased on

unusually cold days.

We learned

still pays for physical retailers with a +84% lift in visits.

and jewelry stores +12%.

Noodle and ramen QSRs see an uptick when it

RAINS

while bakeries and frozen yogurt **shops** are less visited.

> 'Tis the season for a new pet. The Saturday before Christmas brings a +66% lift in visits to pet stores

**MERRY CAT-MAS** 

and animal shelters.

"Early on, we built the Barwave app to help bar-goers meet up with friends, but a big component of the bar experience is putting the phone down once you get somewhere, so we needed alwayson location. We heard about the free tier version of Pilgrim SDK from Dennis Crowley's announcement at TechCrunch Disrupt. We're still in the early stages of implementation, but already we're hearing from bars that they're seeing a spike in visits."

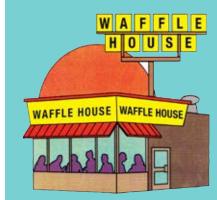
- ZACK ESMAELZADA, CTO, BARWAVE

# WHAT WE'VE

### Winners from this year's **Loyalty Indices**

At Foursquare, we look at foot traffic patterns to better understand how people connect to the brands they love. That's because, despite trends like meal-delivery programs and D2C, more than 90 percent of all consumer spending still occurs in the real world.

Every year, we compile these studies into our Loyalty Indices our way to measure brand loyalty based on behavior to brick-andmortar. We're sharing the results from three rapidly changing industries: fashion, casual dining restaurants and quick service restaurants (QSR).



### **TOP 5 FOR CASUAL DINING LOYALTY**

Waffle House 2 **Buffalo Wild Wings** 3 Applebee's 4 Old Chicago Pizza & Taproom Denny's

Diners value the expanded menu and 24-hour service. Foursquare data says 17% of foot traffic occurs between 10 p.m. and 5 a.m.

**NEWS BITS** 

### **TOP 5 FOR QUICK** SERVICE RESTAURANT (QSR) LOYALTY

**Starbucks** McDonald's Dunkin' 4 Sonic Drive-In Subway

A mix of menu items served throughout the day led to a repeat win for Starbucks.

### **TOP 5 FOR SINGLE BRAND RETAIL LOYALTY**

Old Navy Jos. A. Bank 3 **Hot Topic** 4 **Rainbow Shops** 5 **Maurices** 

Old Navy's app allows customers to check in-store inventory, browse items by customer views and track loyalty rewards points.

### **TOP 5 FOR MULTI BRAND** RETAIL LOYALTY

Kohl's 2 Macy's T.J. Maxx **Ross Dress for Less** 5 Marshalls

Kohl's credits the launch of its app for its success. The app allows customers to complete purchases, order ahead, locate nearby stores and earn rewards.

### **TOP 5 FOR ACCESSORY** & SHOE BRAND LOYALTY

Zumiez **Payless ShoeSource Journeys** 4 **Boot Barn** SHOE DEPT.

The **Zumiez Stash** app allows shoppers to earn points by posting on Instagram, entering receipts and watching videos, translating to VIP experiences.

To access a full loyalty report, as well as the rankings of up to three competitors and a tailored strategy to increase customer loyalty, email us at hi@foursquare.com today.



### **TECH & CREATIVITY** AD AWARDS

Jägermeister wins the **Pinpoint Creative Award** 



### THE LANDSCAPE OF ADVERTISING

is changing. With more ways to reach people than ever, tech is quickly becoming a key factor in any marketing or advertising—from IKEA's

Kama Sutra-inspired online furniture catalog, to Taco Bell's social-promoted sold out concept hotel The Bell, to Reese's ASMR YouTube videos.

This year, Foursquare is honoring Jägermeister with the first ever Pinpoint Creative Award, honoring the best use of our advertising technology. Jägermeister's year-long campaign unfolded in three unique parts that each bridged IRL locations with engaging digital experiences.

Part 1: NHL Legends of Fandom consisted of a microsite and a store locator map that contained trivia leveraged from Foursquare insights and NHL data.

Part 2: Deer & Beer uncovered the best beer and Jäger shot pairings by using Foursquare's first-party taste data and Jäger recipe data.

Part 3: Released for Halloween, Darke Spirit consisted of a microsite and bar locator map where customers were encouraged to go to the venues mentioned and "unlock the Darke Spirit" through a mobile web AR experience triggered by a custom creative, served to the customer in real-time at the bar.

Congratulations, Jägermeister!



### Behind-the-scenes with Foursquare Superusers

Our Superuser community—a network of 44,000 passionate firstparty users and editors—ensure that Foursquare maps and venues are accurate and up-to-date. Meet three from U.S., Turkey and Iran.



**NAME** Ross Rashkov **HOMETOWN** Chico, CA, USA **SUPERUSER** LEVEL 9

of the craziest

places you've

checked into?

"There used to be

a local truck stop

where the users

McDonald's, a

Chevron and a

Starbucks into one

store, effectively

McChevbucks.

McShellBucks.

Of course, since

are in different

chains and

all of these stores

categories, I had

to fix the venue."

Before, the store

used to be named

merged a

naming it

or weirdest

**HOMETOWN** Istanbul, Turkey **SUPERUSER** LEVEL 10 What is one How has using

**NAME** 

**Emrah Yılmaz** 

Foursquare connected you with your local community? "Once, an ambulance driver reached out to us on our Turkish SU fan website. It was a thank you message. He told us that he used many navigation/ location apps but the best was Foursquare. He added that he's actively using Foursquare to find venues and addresses when he is driving his ambulance to

reach the patients.



**NAME** Maryam Ardakani

**HOMETOWN** Tehran, Iran **SUPERUSER** LEVEL 10

What motivates "The SU community religion, nationality,

09

you to stay active in the Foursquare SU community? is one where we all can practice tolerance and learn how to help and respect each other regardless of color, race, language, etc. The SU community is where I truly feel I'm a global citizen."

## THE FUTURE OF B2B MARKETING

We polled hundreds of media and marketing managers, analysts, executives, and founders for their thoughts on what will matter in 2020. Here's what they had to say.

**INSIGHT 01** 

### SOCIAL PLATFORMS **WILL CONTINUE TO CAPTURE DOLLARS**

The percentage of survey respondents that will increase investment, by category:

**DIGITAL** 

DESKTOP &

with an emphasis on desktop and mobile web versus mobile app

DESKTOP & MOBILE WEB DISPLAY

to stay, despite and ad blocking

**INSIGHT 02** 

### INVESTMENT IN AUDIENCE DATA IS GOING UP

Nearly 75% of respondents purchased audience data in 2019, and of those, more than half plan to increase their spend in 2020. The investment in data will support a number of success metrics, and the most popular are:

will be further embraced in 2020 DIGITAL AUDIO

**EMERGING** 

OTT/CTV

The popularity of

podcasts continues to drive the increase in spend on digital audio

> WALLED **GARDENS**

SOCIAL PLATFORMS

dominate, despite of lack of transparency

and measurement

**INSIGHT 03** 

### DATA QUALITY **CONCERNS** TO RISE

Over **50%** of respondents believe that third-party audience data meets average to very high quality standards. However, that's not enough to prevent just as many from expecting audience quality concerns to

increase in 2020.

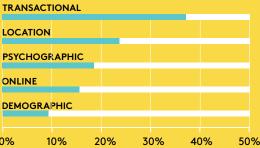
INSIGHT 04

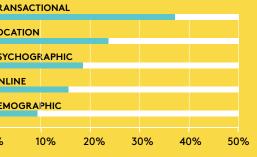
### **DEMO DATA'S VALUE DIMINISHED**

The majority of survey respondents believe that all types of data can be valuable, though transaction and location data are of the highest value.

### **MOST VALUABLE DATA**

(by % of respondents)





**INSIGHT 05** 

### **VISITS WILL BE USED** AS A PROXY FOR SALES

For campaigns not focused on branding, nearly as many are evaluated based on...

Compared to...

**INSIGHT 06** 

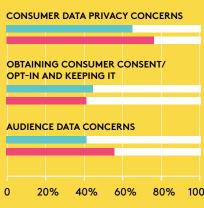
### **EXECS WILL FOCUS ON PRIVACY**

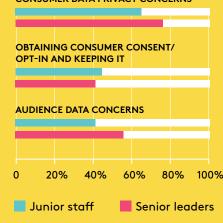
Senior leaders see privacy becoming a bigger issue in 2020 than junior staff, but the groups are more closely aligned when it comes to their attitudes towards consent and opt-in.

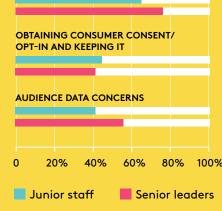
Senior leaders are also more concerned about how third-party data is sourced, likely because they're more attuned to privacy issues across the board.



**INCREASING CHALLENGES IN 2020** (by % of junior staff vs. % of senior leaders)





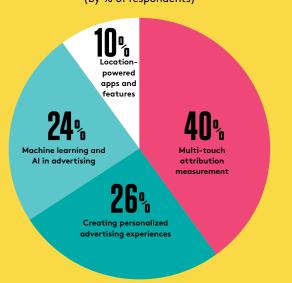


**INSIGHT 07** 

### **MULTI-TOUCH ATTRIBUTION** HAS HUGE **POTENTIAL**

Multi-touch attribution was considered the most pressing challenge of 2019 and the biggest B2B marketing opportunity in 2020. Additionally, 51% of respondents are already investing in an attribution solution as of this year.

**TOP B2B MARKETING OPPORTUNITIES IN 2020** (by % of respondents)



**INSIGHT 08** 

### **CUSTOMER** SOPHISTICATION

In 2020, marketers don't expect to need as much hands-on support. When asked what they prioritize out of a third-party audience data provider, accuracy, scale and interoperability (flexibility and portability) all scored higher than customer service.

**ACCURACY SCALE** GRANULARITY PRIVACY

SELF-SERVICE

CUSTOMER

BRAND NAME

table where it all began.



"In the summer of 2008, we decided we were going to get serious about developing Foursquare. When we were first starting to work on it, we didn't have an office. But, I had my apartment, and I had this big table where we all could spread out, so it made sense for us all to work from there.

I didn't have a coffee maker, so, for the eight months or so that we were developing really hard, we would rotate between sitting at my table and working from a coffee shop.

Sometimes we'd go to the coffee shop on Mercer Street called Think Coffee, but then we wouldn't be as productive, and so we would head back to the apartment.

Of course, back then I had no idea that Foursquare would become what it is today. I thought it would be an app that our friends would use to find each other in New York—maybe 100 people would use it. I never imagined it would grow into a platform that serves billions.

Today, 10 years later, that same kitchen table is covered in crayon marks. It's crazy to think about all the different life stages that it's been with me—from the first days of Foursquare to seeing my family grow up, eating and playing around it. We're moving across Broadway, and in some ways it feels like moving to a whole different city—New York can be like that. We'll still be downtown, but it will feel different—and we're not taking the table with us. It has served us well over the past decade. But it's exciting to think about all that's to come in this next chapter." 🗾

# "LOOK. INEED TO KNOW WHERE THE ELEVATORS ARE IN THIS CITY."

### IT CAN BE EASY TO OVERLOOK ALL OF THE WAYS

that technology can be used—and is being used—to improve the lives of millions of people and make real social impact. But what good is holiday cheer without a dose of optimism? The Foursquare for Good program exists to support these ideas and bring them to the fore. In 2019, we've suffered through doom and gloom. So let's focus on the good stuff for once—the meaningful changes that tech brings forth.

The mission of Foursquare for Good is to partner with developers, engineers, academics, non-profits, policymakers and data scientists to make the real world a better, smarter, safer and more inclusive place through the power of location technology. From the very beginning, Foursquare has been focused on creating a future where people engage with the real world more deeply through location technologies. That's why we opened up access to our API to the developer community back in 2009, and why this year, we opened up our Pilgrim technology via a free tier to small- and mediumsized companies, too. We want our technology to act as the foundation upon which incredible innovations are built. We do this because we've always known that location technology has the power to change the world.

Consider how our technology improves accessible navigation. <u>BlindSquare</u> and the <u>American Printing House for the Blind</u> pio-

### Wheelmap

Wheelmap uses the Foursquare API to identify wheelchair-accessible restaurants and shopping areas and easy access to public transportation nearby.



### THE KIOSKS HELP ME NAVIGATE NEW YORK, AND STAY CONNECTED TO THE DRUMBEAT OF THE CITY."

- NYC LOCAL

### LinkNYC



Since Intersection launched LinkNYC in 2016, it has provided local information and free Wi-Fi to New York City. Certain screens are

neered technologies to help the blind and visually impaired move through the world independently. They leverage our location data to create an auditory guide to cities, directing users to nearby points-of-interest and even providing turn-by-turn navigation. Meanwhile, Wheelmap designs assistive technology for people with special needs to find wheelchair accessible places nearby, while Intersection helps make cities easier to use by building products that connect the digital and physical worlds.

Another important use case to emerge has been for promoting mental and physical health. Objective Zero (the winner of the 2018 Foursquare for Good challenge) leverages our Pilgrim technology to create a machine learning algorithm to identify veterans in need of mental health and wellness resources. They use this information to provide users with tailored responses to help de-escalate potentially high-risk situations and aid in the effort to prevent suicide. And this year, the 2019 Foursquare for

Good winner is AsylumConnect, an LGBTQ+ organization with an app that helps its community find verified support and resources.

Over the past two years, submissions have ranged from location tech that motivates young Americans to vote, apps that reduce food waste by creating smarter delivery systems, tools that improve cardiovascular health and reward heart healthy choices, and services that improve traffic flow in major urban centers...the list goes on and on.

Inspiring and supporting these importantyet-delightful use cases remains core to us at Foursquare. In terms of core values, it's not enough to simply not be evil, as Google made famous. We want to Make it Delightful. Read on for quotes from real-world users of apps that leverage our technology to make the world a better place for everyone.



### "YOU SAVED MY LIFE, MY MARRIAGE AND MY FATHERHOOD. I CAN'T THANK YOU ENOUGH."

- OBJECTIVE ZERO **USER** 

### Objective Zero

The winner of the 2018 Foursquare for Good challenge uses Pilgrim SDK to support veterans in need of

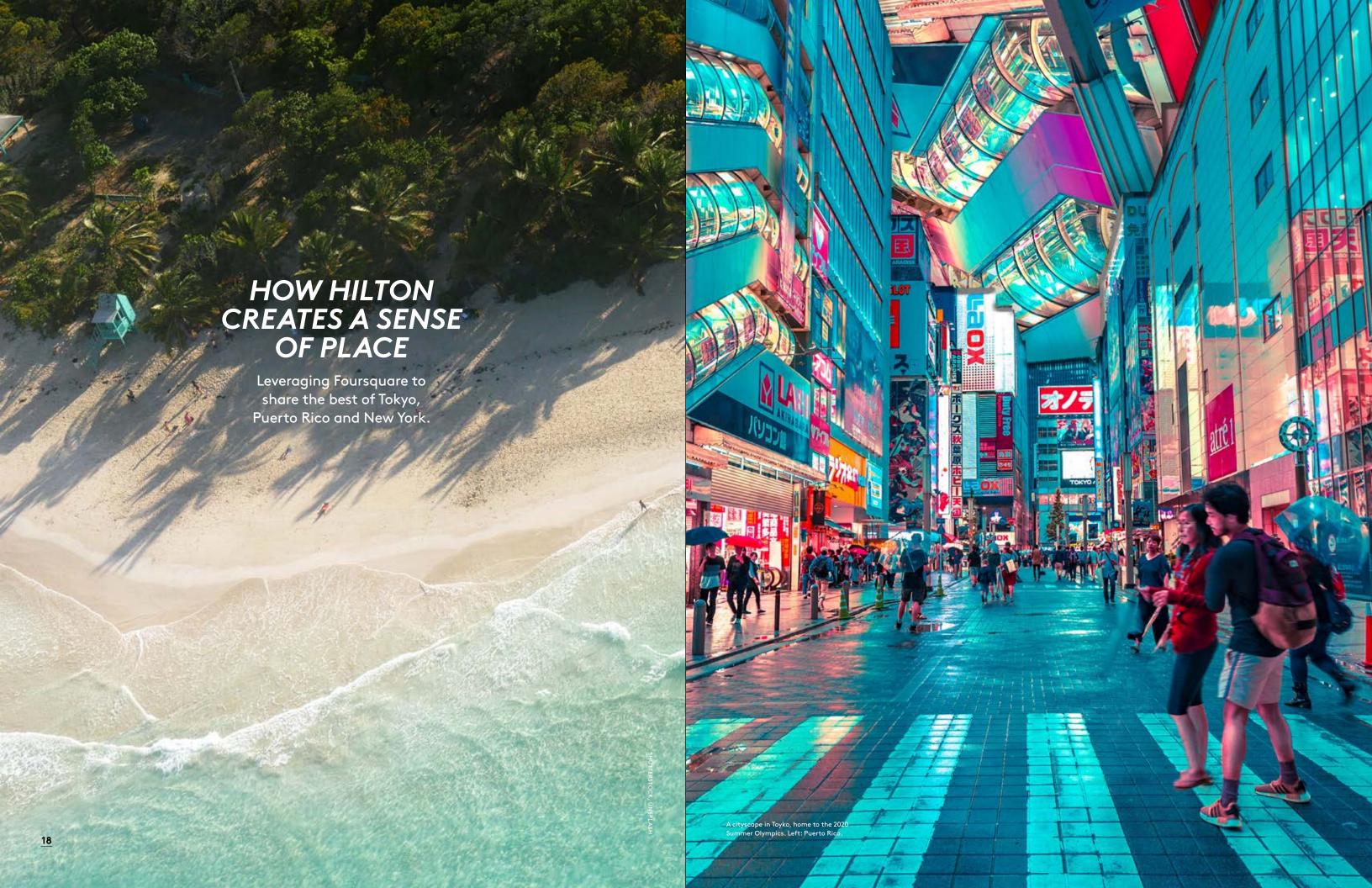


### FOR THOSE OF US WHO ARE BLIND, SAFE AND INDEPENDENT TRAVEL REMAINS OUR **GREATEST** CHALLENGE."

- JIM SANDERS, **BLINDSQUARE USER** 

### Blindsquare

Blindsquare's audio guides feature information its users need every day.



EARLIER THIS YEAR, Hilton Team Members in nearly 60 markets globally and spanning over 1,400 properties created essential travel guides for hotel guests. These bespoke guides were designed to give guests a true taste of local flavor, and include photos, not-to-miss menu items, off-the-radar places to visit—and powered by Foursquare Places. The result of all the hard work? Thirty percent increase in time spent in-app. We got a sneak peek into guides for three cities that will be major destinations in 2020—from the rebuilding of Puerto Rico to the Tokyo Olympics. Here are a few of our favorite travel recommendations.

# TOKYO







Clockwise from left: G. Itoya stationery store in Ginza; Odeo Onsen Monogatari spa in Kōtō; more from G. Itoya.



Go to Tokyo the year it hosts the Summer Olympics.

According to Hilton expert Ryuichi. "I'm a big sports fan and my greatest weakness is that I find sweet things impossible to resist!"

### G. Itoya / stationary store

You will go crazy here if you are a stationery lover. All kinds of pens, papers, greeting cards, notebooks, travel gadgets, painting items... Mail a letter to your family and friends at the shop.

### Odeo Onsen Monogatari / spa

No time to visit Hakone or Onsen? Here is the nearest you can fully experience it, with 13 different kinds of baths and saunas, plus foot fish therapy.

### TREE by NAKED yoyogi park / restaurant

VR, projection mapping, lighting, music... Is this a restaurant? Art museum? Or something else? TREE will stimulate all of your senses during the eight-course meal. Reservation needed—and the hotel can help



Clockwise from top left: A snack from Smorgasburg; inside The Campbell, in Midtown East;

the iconic Chrysler Building



# PUERTO RICO



and watch a destination rebuild.

According to Hilton expert Betty. "I love spending quality time with my family, dancing, gardening and sailing."

### San Juan Paddle Boarding / Laguna de Condado

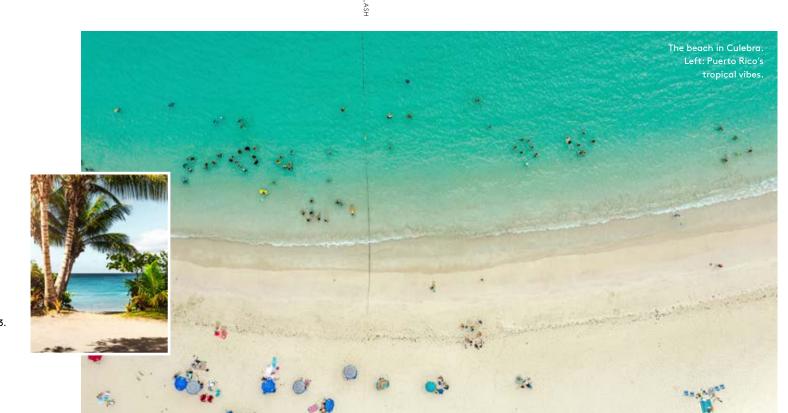
On weekends, feel like you're part of the local community while snorkeling, paddling or just swimming in the Laguna. If you are lucky you can see the resident manatee family.

### Ropa Vieja / restaurant

Fine Cuban and Puerto Rican cuisine in an open area restaurant. Perfect for business and group lunches and dinners.

### Paseo de la Princesa / plaza

El Paseo de La Princesa, the most beloved promenade in Puerto Rico, dates back to 1853. This beautifully restored walk is a favorite place for locals.



### Go to New York City, Foursquare's

homebase. According to Hilton expert Julie. "I'm a hotelier by day, wine connoisseur by night, and always on the hunt for the best latte!"

### Museum of the Moving Image / museum

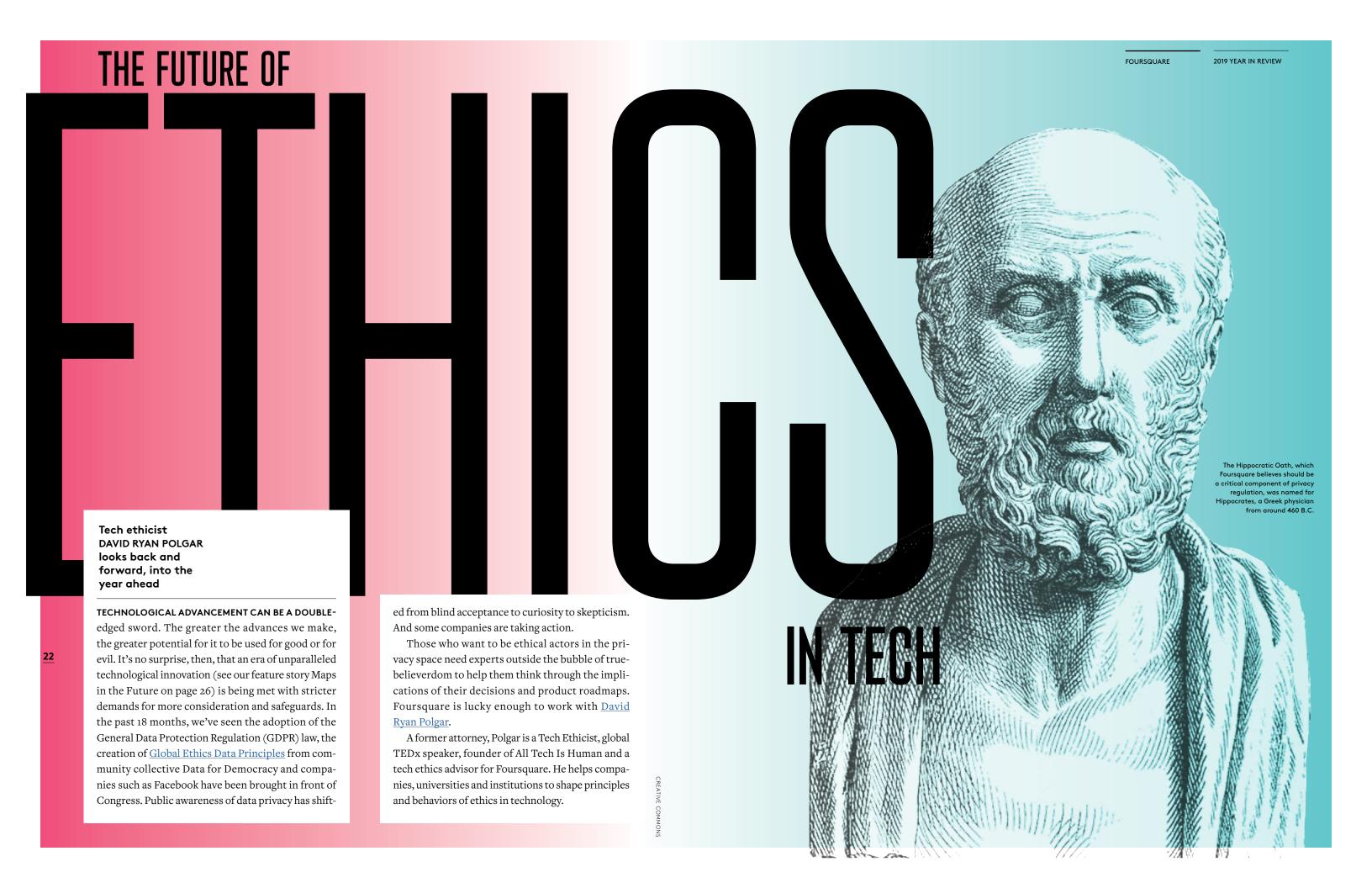
A fun and unexpected museum in Astoria. Check out the arcade room (you will need tokens to play) and the pop culture memorabilia. Fridays from 4-8 p.m., it's free admission.

### Smorgasburg Prospect Park / street fair

The Prospect Park Smorgasburg lures slightly fewer crowds than the one in Williamsburg. Still, expect lines and make sure you bring cash.

### The Campbell / bar

A unique speakeasy attached to Grand Central Terminal with great cocktails. It's a wonderful after-work spot or place to bring a date. Try the prohibition punch.



25

"Being ethical is everyone's responsibility," he says.

"It is important to empower people throughout the

### I. CONSENT

The Global Ethics Data Principle: "Consider (if not collect) informed and purposeful consent of data subjects for all projects, and discard resulting data when that consent expires."

Consent is a major topic in tech ethics, from how data is collected to how it is shared—an issue that's been increasingly prominent since the GDPR law. "Until recently, there was a wide gulf between European and American values in regard to privacy, with Americans often assuming that principles such as the 'right to be forgotten' were uniquely European," explains Polgar.

"The implementation of GDPR has impacted how Americans think about their relationship to tech companies and government; we now expect greater responsibility from the former and more oversight from the latter. But today, the government doesn't have the authority."

In the coming year, we anticipate the conversation around consent to expand as the public, lawmakers and companies in the U.S. continue to adopt to GDPR and CCPA principles.

### II. RESPECT

The Global Ethics Data Principle: "Respect relevant tensions of all stakeholders as it relates to privacy and tech ethics."

Complex companies and industries grapple with overlapping tensions and needs. Polgar notes that a key principle in respecting these relationships involves anticipation, planning and consideration of how technology impacts everyone involved. "The biggest threat to tech ethics today is the difference between the speed of tech innovation versus the speed of tech consideration," he explains. "The more we can actively consider ramifications before the technology is widely adopted, the better. Addressing and even preempting these issues would be ideal. This will require us to find ways to make the process of how we develop and deploy technologies more inclusive, multidisciplinary and participatory."

### III. NOT ALL DATA IS NEUTRAL

The Global Ethics Data Principle: "Make best effort to protect anonymous data subjects, and any associated data, against any attempts to reverse-engineer, de-anonymize, or otherwise expose confidential information."

Data is personal—in some cases deeply so. From which doctors you see to what church you attend, the information we provide and store on our phones gets to the core of who we are and what we believe. Having enough trust in companies and institutions to know the difference between neutral data and confidential data is key.

"We are now viewing the actions of tech companies as related to wellness, freedom of mind and the health of

Ethics training by David Ryan Polgar for the entire Foursquare team, from Foursquare HQ in New York City.





# DAVID RYAN POLGAR'S 4 QUESTIONS TO CONSIDER FOR THE ETHICAL USE OF DATA

0

Is the data being collected out of a genuine purpose?

02

Is the user aware of the data being collected and who will utilize it?

0:

Have we put in place the necessary safeguards to maintain the data?

0

Are we considering the downstream impact of the data?

our democracy," Polgar explains. "We need to be able to trust companies with our data, and have the confidence that they know the difference between neutral and personal information." A strong stance and track record for any company is critical.

### IV. TRANSPARENCY

The Global Ethics Data Principle: "Practice responsible transparency as the default where possible, throughout the entire data lifecycle."

"In the year ahead, the conversation around tech ethics will benefit from a greater level of transparency about the issues the industry is facing, and the ways in which our data is being used," Polgar explains. "There is a significant amount of nervousness around discussing ethical dilemmas, but eventually, this will be a more open conversation."

Looking ahead, knowing how our data is used and being clear about the safeguards that are in place will be a major part of the dialogue. "The general public benefits from safeguards being explicitly laid out," Polgar explains. "We want companies that can do good by being good."

### IV. RESPONSIBILITY

The Global Ethics Data Principle: "Ensure that all data practitioners take responsibility for exercising ethical imagination in their work, including considering the implication of what came before and what may come after, and actively working to increase benefit and prevent harm to others."

A constant debate in tech ethics is where the onus of responsibility lies for ensuring that technology is deployed and developed in the most ethical way possible. Polgar is quick to point out that this responsibility is interwoven: the public, the government, companies and the media all need to work to ensure ethical procedures. Frankly, each of these entities need to step up. Companies cannot be content to have an ethical standard of "whatever is legal." Congress needs to step up and create overarching regulation. The public needs to understand that their own habits are the last line of defense for maintaining their own privacy.

"The key aspect of incorporating tech ethics is ensuring that the debate is always happening, and that systems and people are in place to consider the topic from multiple angles." That means all entities working together at all times, and not for any one entity's sole gain. The conversation around ethics in technology is unfolding day by day. It is through working together that we can ensure the most responsible—and ethical—future.

For more on Foursquare's approach to privacy in location data, check out our New York Times op-ed "How to Stop the Abuse of Location Data" from this October.



# IMAGINE A LAYER OF DIGITAL INFORMATION DRAPED OVER THE ENTIRE PHYSICAL WORLD.

Every object has a digital twin and can be segmented, searched and linked as easily as two web pages can be linked today. Smart glasses bubble up the most relevant, interesting and entertaining digital information in front of your eyes.

That's the vision of "mirrorworld," a term created by Yale researcher David Gelernter and popularized by editor and futurist Kevin Kelly in a cover story for the February 2019 issue of WIRED. "The mirrorworld doesn't fully exist yet, but it's coming," writes Kelly. "This world will become the next great platform."

The road to mirroworld goes something like this: In the beginning, there was the world wide web, born 30 years ago. Web pages were flat, static, but still transformative—a sea of information, available to anyone with an internet connection. Web pages could link to one another, like a library of books where footnotes led directly to the titles they referenced. Companies like Google realized that, by analyzing how web pages linked to each other, they could be organized into something searchable, and became tremendously rich and powerful doing so.

In the early aughts, the web shifted. It was no longer just static HTML, but instead dynamic web applications. You didn't just read the internet; you used it—uploading photos, friending other people and posting status updates. Aided by the concurrent rise of smartphones and social networks, Web 2.0 created digital links between people. Companies like Facebook realized that, by analyzing how people link to each other, they could be or-

ganized into something comprehensible and usable, and became tremendously rich and powerful doing so.

The next change will be more fundamental. The physical world, already digitally mapped by Google, Apple, Foursquare and a host of smaller players, will be remapped at ever-higher levels of detail, eventually creating a photorealistic 3D digital twin of our material environment. Thanks to the rise of the Internet of Things, there are billions—and soon to be trillions—of sensors in the world, collecting data that will be collated into a cohesive whole. Physical objects will be digitally connected to one another—and to us, in the same way that web pages link to one another, and are made available to machine learning and algorithms. To see all of this new data, we'll be staring into a 3D world: our reality, but overlaid with a one-to-one layer of digital information.

In the future, our machines will connect to the physical world, and the physical world will connect to our machines. What remains very much up in the air? Which company will figure out how to analyze and organize all this information into something searchable, comprehensible and usable—and become tremendously rich and powerful doing so.

### THE PREEXISTING BITS OF

mirrorworld exist on a spectrum. On one end, you have all of the spatial and locative data easily integrated into daily life today. This tech is non-immersive: it's everything from Google Maps showing you how crowded the subway is right now, to being able to check if a pair of shoes you want is in stock at your local store.

On the other end of the spectrum is the tech that is closed-off and immersive, but difficult to merge into our quotidian life. Here we have things like the Oculus Quest or The Void VR experience: fully 3D worlds that can be explored by physically walking around, and even contain physical objects to interact with that are also mapped into the digital world—touch a real but blank wall in the real world while wearing a Void VR headset, and you see the side of a virtual temple wall, with mysterious hieroglyphics for you to decipher.

In the middle of the spectrum: augmented reality (AR) layered atop a digital 3D world, via many of the same techniques employed by immersive VR but with-

out the face-covering glasses (think Snapchat filters). Mirrorworld will be the synthesis of these two ends of the spectrum, pushed into our world via a long thread emerging from the middle that will expand out to overtake nearly everything.

### THE FIRST GLIMPSES OF

mirrorworld can be seen everywhere, once you're looking for them.

That middle part of the spectrum, augmented reality (AR), has already become commonplace. Every time a Snapchat user puts a floating location tag bragging about a vacation spot, an Instagram user deploys a face filter to turn themselves into a koala, or someone uses Apple's Measure app as a virtual tape measure, that's augmented reality in action. Augmented reality analysis firm Artillery Intelligence estimates that there were 334 million active augmented reality users on mobile in 2018, projected to grow to over 1 billion by 2023.

QReal Technologies builds photorealistic AR food you can see through your phone for Panera, Magnolia Bakery and Bareburger. Studies from the University of New South Wales and Oxford examining QReal's tech show that AR food works quite well in getting us to buy real food. "You're willing to buy more and buy more expensive items by seeing it there," says QReal general manager Michael Cadoux. "You're tricking the brain into getting hungry."

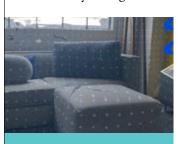
Real estate app Houzz built an AR app that allows you to place AR furniture in your physical room, seeing how a couch or set of shelves would look in your space. Customers who engage with the AR app are 11 times more likely to buy furniture, and spend nearly three times as much once they do.

rors. MemoMi powers augmented reality "memory mirrors" for clients like Neiman Marcus and Giorgio Armani, allowing customers to try on virtual clothes and swipe through various colors. "We have the capability to augment thousands of shirts or jackets or colors and patterns in real time," says founder Salvador Nissi. "Stores can reduce the physical footprint and have endless inventory."

And mirrorworld is altering how we move through our physical environment. Google Maps now offers Live

Appropriately, mirrorworld can be overlaid on mir-

And mirrorworld is altering how we move through our physical environment. Google Maps now offers Live View for walking directions. Hold up your phone, and Google scans the nearby buildings and then provides you turn-by-turn directions via floating arrows. The effect is like staring through a windowpane and suddenly having a much better sense of direction. Pokemon



6D.ai builds an indoor and outdoor 3D map of the world with a smartphone camera for world-scale gaming, navigation and collaboration. Go, the AR game that became a craze in 2016, created massive crowds in parks and on street corners, with players moving their own digital twins across real cities in search of virtual Pikachus and Charizards.

And, like any emerging tech, mirrorworld is also causing problems. The traffic app Waze, by creating a digital twin of every user as they drive, enables commuters to avoid rou-

tine traffic jams. In 2018, the town of Leonia, New Jersey, banned non-resident drivers who were cutting through its streets thanks to Waze (and Google Maps, which is powered by Waze) diverting drivers away from a bottleneck that forms during rush hour on the approach to the George Washington Bridge. People have resorted to reporting fake accidents in the app as the "Waze craze" diverts more and more traffic onto formerly sleepy streets.

### **BUT THERE'S STILL MUCH OF MIRRORWORLD** yet to be built.

Google Earth is the rough draft of the physical world rendered digitally, but it will need to be refined. Zurich-based Nomoko is busy doing this work in cities, using a 1,500-megapixel camera to create photorealistic 3D maps of urban spaces at a much higher resolution than



was previously possible. "We're at around one centimeter in accuracy," says Bara Caldova, head of brand and strategy at Nomoko. "Google Earth's accuracy is somewhere in tens of centimeters." That one centimeter of accuracy versus ten centimeters means a much higher resolution world—the top of a fire hydrant may be rendered as a jagged mess at ten centimeters accuracy, but it's a smoothly defined curve at one centimeter.

And this data can also be used in different ways. Buildings, roads, park benches—everything that comprises a city can be tagged and sorted in Nomoko's system, and can have more information attached to it. "We talk with companies that build sensors and collect information about objects in a city. And then they have the data sitting around in an Excel sheet, and they're very, very happy. They collected the data. But that's it." Companies and cities are sitting on vastly useful (and potentially lucrative) information, unsure of the next step to take.



With MemoMi's smart Memory Mirrors, shoppers virtually try on clothes, eyewear and accessories, and can adjust patterns, colors and styles. Details are shared with brands.

For Nomoko, getting that data out of spreadsheets and into extremely accurate maps of cities unlocks all sorts of possibilities. You can determine how sunlight will fall across the city to figure out where to build solar panels. Air pollution can be modeled. "If you're able to use the mirrorworld data of the city down to parking spots, then you can assign specific IDs to these different parking spots," says Caldova. You could find an open

parking spot and pay for it while you parallel park; or, if you're headed to a restaurant eager for new customers, have the restaurant pick up the tab for that same spot.

### 6D.AI, MEANWHILE, IS CROWDSOURCING THE PROB-

lem, building a 3D map of the world through camera phones. 6D.ai has a two-pronged approach. It offers AR app developers a tool to quickly and accurately create a 3D map of an area with enough fidelity to support realistic effects like occlusion (i.e., when a virtual ball rolls behind a real-world table, it disappears). At the same time, 6D.ai gathers all the information from the app developers. Its ambition is simple: create a 3D map

of the entire world. As Nomoko is busy creating a map of the exterior of a city, 6D.ai is doing the same for interiors, mapping out rooms with enough fidelity and detail that it's possible to imagine something like Google Street View, except indistinguishable from real life and with the ability to go inside buildings. And with 6D.ai's crowdsourced approach, as a building's interior changes from a clothing boutique to a coffee shop, it doesn't need to send out an employee or contractor to rescan the space—6D.ai users do the work instead, continuously updating the 3D map of the world.

Just like every stage of the internet to date, network effects accrue. The more people adding data to Nomoko's maps of cities, the more useful they become, and the more data flows in. The more people use 6D.ai's platform to build AR apps, the more of the world gets scanned by users, and the bigger and more accurate the map becomes, bringing in more developers.

### **AND YET: TO EXPERIENCE**

most AR right now, you need to hold up your phone in front of your face—not the best way to walk around a city. Lightweight, unobtrusive AR glasses will be a crucial component of mirrorworld, and also likely the longest in coming.

It's been an open secret in Silicon Valley that Apple is working on AR glasses, filing patents starting ten years ago, and hiring hundreds of AR engineers and developers since then. Buried in the code of iOS 13, Apple's latest operating system, is the program shell for "StarBoard," which allows developers to create augmented reality apps in stereo vision—a linchpin of any AR glasses.

Even assuming Moore's law continues apace, the computational power needed to power 3D glasses displaying holograms on top of the real world is immense, and would be far too bulky to fit into eyeglasses anyone would wear anytime soon. In the near-term, this means that glasses will be paired to your phone. In the longer term, edge computing—sprinkling servers throughout a city that you connect to via high-speed, low-latency

5G networks—may allow smart glasses to offload the computational heavy lifting to the cloud.

The midpoint may not be our eyes, but our ears. Apple AirPods have provided a sterling example that people are very comfortable wearing headphones for most of the day. "Audio is the unsung modality of AR," says Boland.

At Foursquare, the first steps towards audio AR are already underway in a contextually-aware assistant dubbed Marsbot. Created by the company's R&D team, Foursquare Labs, the context bot has a bit of personality that alerts you to interesting things nearby. Think less Terminator-style computer vision, and more like the Scarlett Johannson AI in the movie *Her*. "Our idea was, what if someone made Microsoft Clippy that wasn't annoying?" says Crowley. Picking up your likes and dislikes and combining this with detailed knowledge of the most interesting cafes and stores nearby, Marsbot whispers ten-syllables-or-less audio cues to steer you towards the things you'd otherwise miss. "It pops up at just the right moment, and it says, 'No, don't go there, go here," says Crowley.

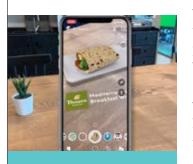
The vision for what Marsbot could do expands the more it can understand not just locations, but the people moving through them. "You start with interesting places, then you move to interesting people you know, and then you move to ephemeral events," says Crowley. Foursquare Labs has a tool called Hypertrending, which is able to create a heat map of where smartphones are in a city at a given moment. "It understands what is unusually popular or unusually interesting at a moment in time," says Crowley. "You put those two things together, you build this pretty amazing radar system letting you know about what's happening nearby."

Unlike Google Glass, which freaked out most people who encountered them, audio AR is for you only, alerting you to spatial information via a subtle whisper. Better yet, most of the technology that enables it is available today, and companies know it. Witness the gold rush to colonize our ears: Apple, Google, Amazon and Microsoft have all released their own earbuds with built-in AI in the past year.

### THE ACTUAL REALITY OF THE MIRRORWORLD IS SOMEthing we'll be grappling with even as it becomes commonplace, in the same way we are still reckoning with

smartphones long after they became humdrum.

Stanford professor Jeremy Bailenson's work already shows how even when we're aware that things in augmented reality aren't "real," we still react to them as if they are. In one study, people who see a virtual person sit down in a chair in AR are much less likely to sit down in the same chair. "Where we look, where



QReal allows a brand to put a 3D AR model into any platform—on the web, social and in-app. Partnerships include BareBurger, Domino's, Panera Bread and Whirlpool.

we sit, how we perform tasks, the presence of these virtual people—you know, you're basically seeing ghosts," says Bailenson. "It changes the way you exist in the real world—how you talk, how you perform, how you behave."

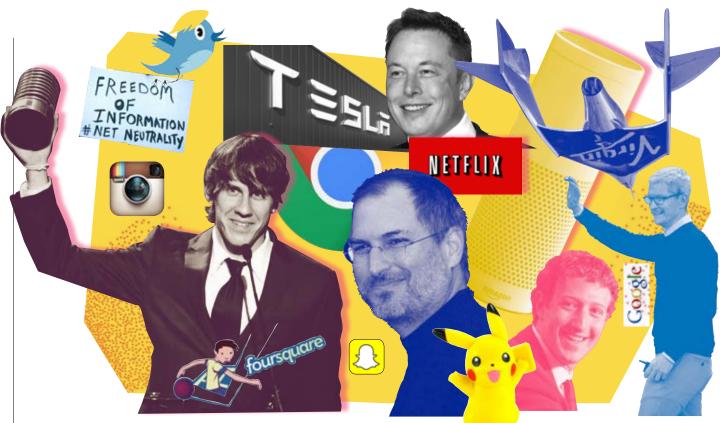
"Progress has been steady on the technology side though we are still years away from my parents parading around in their own AR goggles," says Bailenson of Stanford. "On the other hand, there

has been almost no progress on the social implications of AR." How will the world function, he asks, when everyone is walking around seeing their own augmented version of reality, unique to them?

And if we have shared mirrorworlds, who do we share those worlds with? Modern day social networks have already created "filter bubbles" where we burrow into hives of like-minded people, entrenching our own points of view while dismissing others. In a mirrorworld with pervasive AR, two people with different demographics or ideological beliefs may literally see very different things while looking in the same direction. Like social media before it, mirrorworld will have a limitless capacity to connect people—and to atomize them further.

But we still have time to reckon with everything mirrorworld will bring. Kevin Kelly estimates we'll reach "full mirrorworld" in 25 years.

"I think that's the standard future stuff, that people overestimate how fast things are going to happen and underestimate the consequences," Kevin Kelly said in April 2019, speaking to fellow futurist Charlie Fink. "Don't confuse a very clear view of the future with a short distance. This is a long way away, even though we can see it very clearly."



### A DECADE IN TECHNOLOGY

2009-2019

32

### THINK BACK 10 YEARS AND YOU MIGHT CONSIDER

a few notable absences. No Instagram. No Venmo. No iPad—barely an iPhone. Trump wasn't even on Twitter yet. Co-working wasn't a thing. People watched cable. Snap meant something you do with your fingers. It was a different time. So many of the technological changes that impact our daily lives—from how we get our news to how we buy our clothes to where and how we chat with friends—were created within just the past 10 years. Including us. Foursquare launched at South by Southwest in March 2009.

To honor this milestone, we decided to look back, collecting some of the biggest, most impactful moments from technology over the past 10 years. As we embarked on the journey, we quickly realized: as a collective culture, we have no time capsule or history book that records the advances in technology.

At Foursquare—like all companies—we have our own record keeping. But all of the data from companies large and small—all the countless iterations, versioning, updates, launches—is never shared or made public.

In fact, it's often forgotten. We're left with something akin to that feeling of loss when you update your operating system—our muscle memory only lasts so long before we're on to the next latest thing. Every day, we move into the next version of history; the milestones are as ephemeral as tabs in a browser window.

With this timeline, we're not trying to capture and save the whole story of the entire past 10 years, of course. That's an impossible task. And who saves anything anymore, anyway? (Remember when you had to...) We're simply hoping to capture the most salient of what we all experienced over this past decade to answer a single question: What changed us? Among the social media platforms that spawned societal movements, the constantly accelerating news cycles, and the platforms that brought us closer together, we looked to uncover what truly transformed us and brought us to where we are today. And like any evolution, what we learn from the past changes every day, with every passing glance and review of what has come before.

Now it's your turn: Have something to add? Tweet us at #10YearsinTech and share the milestones we may have missed, and what you think changed us the most. We'll be sharing your thoughts going into 2020.

## 2009

11.73b Smartphone Devices sold In the U.S. 14%
PERCENTAGE OF AMERICANS WHO OWN SMARTPHONES

Most Popular No.1 Movie

10S APP Avatar

Avatar

Avatar

Avatar

U.S. PRESIDENT

JANUARY 1 Crowdfunding site
Kickstarter launches. The first project
ever listed was a Grace Jones t-shirt
line created by Kickstarter founder
Perry Chen. It wasn't funded.
They've gone on to fund more than
400,000 projects

JANUARY 1 Messaging app WhatsApp is released by former Yahoo! employees

JANUARY 9 **Bitcoin** is released by its mysterious and possibly pseudonymous creator, Satoshi Nakamoto

MARCH 1 Uber launches in North America

MARCH 16 Foursquare launches at SXSW

APRIL 9 Mobile banking app **Venmo** launches

MAY 4 Donald Trump posts his firstever tweet

SEPTEMBER 4 Foursquare raises \$1.35 million in Series A funding backed by Union Square Ventures, O'Reilly AlphaTech Ventures and angel investors

OCTOBER 22 Microsoft releases Windows 7

NOVEMBER 16 Foursquare opens its API to the public

DECEMBER 14 The 4th generation broadband cellular network 4G was opened in Scandinavia. With speeds up to 500 times faster than 3G, it would change our mobile internet experience by allowing for for mobile HD TV and high-quality video calls

DECEMBER 22 GPS navigation is available via TomTom on the iPhone 3G. Google releases free turn-by-turn software on Android phones

2010

18b Smartphone Devices sold In the U.S. 22%
PERCENTAGE OF
AMERICANS WHO OWN
SMARTPHONES

Obamo

PRESIDENT

Angry Birds MOST POPULAR IOS APP Toy Story 3 NO.1 MOVIE OF THE YEAR

**WeWork** launches in SoHo, New York City

JANUARY 1 Google releases its first consumer phone, the Nexus One

JANUARY 1 Foursquare launches worldwide

JANUARY 2 Google launches Fiber for the very first time in the world, Kansas City, Missouri APRIL 1 Foursquare hits one million users

APRIL 3 Apple begins selling the iPad and has an 84% share of the

tablet market by year's end

APRIL 16 Foursquare Day parties

FEBRUARY 15 Digital-first eyeglasses

MARCH 1 4G technology is released for

company Warby Parker launches

the first time on Sprint's HTC Evo

MARCH 1 Pinterest launches

are thrown in 150 cities to celebrate
the launch of Foursquare

JUNE 24 Apple releases the iPhone 4

JUNE 29 Foursquare raises \$20 million in Series B funding

AUGUST 18 Facebook launches its "check-in" feature. Dennis Crowley holds impromptu Foursquare meeting, saying: "They can copy what we've done, but not where we're going"

SEPTEMBER 10 Beauty subscription service Birchbox launches

OCTOBER 1 Jack Dorsey, founder of Twitter, launches **Square** 

OCTOBER 6 Instagram launches. 25,000 people sign up on the first day

OCTOBER 11 Unicode officially adopts emoji, adding hundreds more—like cat faces emoting happiness, anger and tears

OCTOBER 25 Sony retires its cassette Walkman, which first debuted in 1979

NOVEMBER 4 Microsoft launches Kinect, a motion-capture device for its gaming console Xbox 360, enabling users to interact with their console without the need for a game controller

NOVEMBER 18 Facebook pays the American Farm Bureau Federation \$8.5 million to acquire the domain **fb.com** 

**NOVEMBER 24 Netflix** offers a subscription streaming service

**DECEMBER 1** Verizon launches **4G** technology



### TRISTAN WALKER

Founder and CEO of Walker & Co. Brands.
Fast Company's September issue cover star and
Foursquare's first business development hire.

"We've seen a distancing of social interaction over the past 10 years, powered by large social media companies. I think we'll see a return to social technology that empowers meaningful offline social interaction. Users will eventually look to get off their devices to connect."

27.5b 36% SMARTPHONE DEVICES SOLD IN THE U.S.

PERCENTAGE OF AMERICANS WHO OWN SMARTPHONES

Angry Birds Harry Potter 3 MOST POPULAR NO.1 MOVIE INS APP OF THE YEAR

Obama U.S. President

JANUARY 1 Eric Schmidt steps down as CEO of Google

FEBRUARY 4 Facebook becomes the internet's largest photo host, housing about 60 billion photos

FEBRUARY 15 IBM's supercomputer Watson defeats two human beings on Jeopardy!

**FEBRUARY 15** Apple launches subscription service for magazines, newspapers and videos

MARCH 1 Google's Android OS becomes the most widely used mobile OS in the United States

MAY 16 NASA's space shuttle Endeavor launches for the final time

JUNE 1 Google acquires Waze for \$1.3 billion to add social mapping to its mapping business

JUNE 15 The first Chromebooks, built by Acer and Samsung, go on sale

JUNE 15 Online art auction house Artsy is demoed at Art Basel before officially launching in 2012 with \$50 million in venture capital

JUNE 24 Foursquare raises \$50 million in Series C funding

JUNE 28 Google+ launches

JUNE 30 Facebook becomes the first web site to surpass 1 trillion page views per month

AUGUST 24 Steve Jobs resigns from Apple and is succeeded by Tim Cook

**SEPTEMBER 7** The first **4TB hardrive** is created and released by Seagate, engineered for video content like DVRs

SEPTEMBER 13 Trello is released

**SEPTEMBER 17** Protestors identifying themselves as "the 99%" storm New York's Zucotti Park, beginning the monthslong protest known as Occupy Wall Street

**SEPTEMBER 30** Online payment platform Stripe launches

OCTOBER 2 Apple's virtual assistant, Siri, launches

**OCTOBER 5 Steve Jobs** dies of pancreatic cancer

OCTOBER 12 iOS 5 is released, expected to include strong location capabilities. It doesn't deliver

**OCTOBER 31** The world's population reaches 7 billion, according to the United Nations

NOVEMBER 26 The Mars rover, Curiosity, launches

33.7b SMARTPHONE DEVICES SOLD

47% PERCENTAGE OF AMERICANS WHO OWN

The Avengers

NO.1 MOVIE OF THE YEAR

YouTube MOST POPULAR Obamo PRESIDENT

More Americans are reported to have **smart phones** than have traditional cell phones or no cell phone combined

FEBRUARY 15 Nevada becomes the first state to legalize the operation of self-driving cars on U.S. roadways, for

FEBRUARY 29 The Raspberry Pi modular computer launches in the U.K.





### RACHEL BARAJAS

Placed powered by Foursquare client success coordinator and at 22, the youngest full-time Foursquare employee.

"2009 is the same year that I created my Twitter account. I remember having to keep it a secret from my parents, since I was only 12 years old at the time. Barely any of us owned an iPhone. One weekend, my softball team was out of town for a tournament and 15 of us girls crowded around the singular hotel computer and took turns creating our own Twitter accounts. To utilize my Twitter account, I tweeted by texting the number '40404,' and all my followers received a text message notification with my most recent tweet. This was the first time I was able to connect with my peers and know their whereabouts, how their mood was changing, or just their favorite song lyrics without having any direct communication. continue to see evolve as I do."

When most of my friends and I were receiving tweets as text messages, we never saw an advertisement. In 2009, Twitter used to be a way to connect with a small social circle. Now, 10 years later, we connect with the entire world. We are not only interacting with our peers daily but with news stations, brands and especially advertisements. Promoted tweets fill our timelines, and it's my job to measure the effectiveness of digital advertisements. The advertisements on my timeline have a new meaning. I file through my brain wondering how each advertisement is being targeted, and get curious if it is driving visits or revenue. The tech industry and I have grown up together, and it is great to work in a space that I can

MARCH 1 Google puchases Motorola Mobility

MARCH 13 The Encyclopedia Brittanica halts its print edition, after 246 years

MARCH 18 Google Chrome becomes the most popular Web browser, beating out Internet Explorer

APRIL 5 Google unveils its plans to create "augmented reality" glasses, in what the company calls "Project Glass"

**APRIL 9 Facebook buys Instagram** for \$1 billion

**APRIL 24 Google Drive** is released

MAY 12 A rebranded version of the app Picaboo, called Snapchat, is processing 25 images per second

MAY 18 Facebook's IPO. Share prices would decline by 16.5% over the next week

MAY 25 SpaceX's unmanned Dragon **craft** becomes the first private spacecraft to reach the International Space Station

JUNE 1 Lyft launches in the **United States** 

**SEPTEMBER 1 Keurig** launches the in-home K-cup coffee maker. Today, one in four home coffee makers is a Keurig

**SEPTEMBER 12 Tinder** launches (it later becomes one of the first enterprise users of Foursquare's Pilgrim SDK)

SEPTEMBER 20 The world's first 3D printer outlet opens in New York City **SEPTEMBER 24 Tesla** announces first-ever supercharger stations, located in California.

**OCTOBER 25** Microsoft launches Windows 8

NOVEMBER 18 Nintendo releases the Wii U in North America

**DECEMBER 26** The world's longest high-speed rail link, at 2,298 km, launches between Beijing and Guangzhou

42.96b SMARTPHONE DEVICES SOLD IN THE U.S.

59% PERCENTAGE OF AMERICANS WHO OWN SMARTPHONES

Frozen

NO.1 MOVIE

OF THE YEAR

Candy Crush MOST POPULAR IOS APP

PRESIDENT

FEBRUARY 1 Netflix releases its first blockbuster originally-produced piece of content, House of Cards

FEBRUARY 15 The Mars rover Curiosity collects a drill sample containing elements of sulfur, nitrogen, hydrogen, oxygen, phosphorus and carbon—the "building blocks of life," on Mars

APRIL 1 Google previews "Google Glass" but opts not to bring it to market

MAY 1 Hovertrax launches a Kickstarter campaign to bring the "self-balancing scooter" to market. Hoverboards are back

JUNE 1 Google's Chromecast streaming device is released

JUNE 5 Former NSA contractorturned-whistleblower Edward **Snowden** releases documents detailing global electronic surveillance and data collection programs

AUGUST 1 Slack is released

**AUGUST1** Foursquare's **Pilgrim** Ping function works for the first time at Little Cupcake Bakeshop. The company deploys Pilgrim within the Foursquare app

**NOVEMBER 1** Snapchat launches "Stories"

**NOVEMBER 15** Sony releases the Playstation 4

**DECEMBER 19** Foursquare raises \$35 million in Series D funding

48.87b SMARTPHONE DEVICES SOLD

IN THE U.S.

68% PERCENTAGE OF AMERICANS WHO OWN SMARTPHONES

Facebook Messenge MOST POPULAR Transformers

NO.1 MOVIE OF THE YEAR

U.S. PRESIDENT

JANUARY 11 Amazon's Alexa launches

FEBRUARY 5 Foursquare announces partnership with Microsoft

**FEBRUARY 19 Facebook acquires** WhatsApp for over \$19 billion, the richest-ever acquisition for a venturebacked startup

APRIL 1 Netflix has 50 million global subscribers and is operating in 41 countries

APRIL 6 HBO launches Silicon Valley, a comedy about the Palo Alto tech hub

APRIL 7 A fix is released to a security bug known as **Heartbleed**, which jeopardized the security of over 17% of the web's secure servers

APRIL 23 Facebook's mobile user base surpasses 1 billion users

MAY 1 Foursquare consumer apps split into Swarm and Foursquare City Guides

JUNE 16 Netflix begins streaming select titles in 4K resolution

JUNE 24 NASA's Mars rover completes 1 Martian year (687 days) on the planet

JULY 15 The first ice bucket challenge is waged, with a soon-tobe-viral video appearing on YouTube

**AUGUST 1** Snapchat introduces Geofilters to the platform

SEPTEMBER 12 SanDisk releases a 512GB SD card, at the time the I argest capacity ever achieved on the postage-stamp-sized format.

OCTOBER 28 Jay-Z's Tidal music streaming service launches

52.9b SMARTPHONE DEVICES SOLD IN THE U.S.

Facebook Messenge Star Wars VII MOST POPULAR NO.1 MOVIE

affect society."

OF THE YEAR PRESIDENT

Digital home viewing surpasses DVD rentals and home viewing

72%

PERCENTAGE OF

SMARTPHONES

AMERICANS WHO OWN

Foursquare reaches 50 million users

**JANUARY 1** Snapchat hits 75 million users

FEBRUARY 26 The FCC rules in favor of "net neutrality," classifying consumer broadband internet as a public utility in the U.S.

MARCH 23 Foursquare partners with Twitter

**APRIL 14** Foursquare announces Pinpoint

MAY 5 Foursquare integrates Swarm check-ins on Apple Watch

JULY 14 NASA's New Horizons craft performs a close flyby of Pluto

JULY 29 Microsoft launches Windows 10

AUGUST 1 Google becomes Alphabet, a parent company that includes Nest, Google X, Fiber and Google Ventures. Sundar Pichai is named CEO

**SEPTEMBER 1** Netflix commissions 12 episodes of Black Mirror, the modern take on The Twilight Zone (and seems all too real)

technology when many credit card purchases to credit card processors

**OCTOBER 16** The world wonders: what does it mean to "Netflix and chill"?

streaming service is launched

OCTOBER 1 Banks switch to EMV chip companies shift liability for fraudulent

OCTOBER 28 YouTube Red, a premium

### JEFF GLUECK Foursquare CEO, 2016-2019, and dad of three

"It's impossible to look back 10 years and not recognize how technology has created echo chambers for divisive language, news and hate speech. We're seeing the general polarization of the U.S. As a father, I think about this a lot—how technology can be a force for good, but also how it's dividing our country and impacting our children. It strikes me in such a strong way. It's time for tech leaders to take responsibility for the products they make and how they

an artificial intelligence research organization

tech investors found OpenAI,

**DECEMBER 11** A group of prominent

55b SMARTPHONE DEVICES SOLD IN THE U.S.

75% PERCENTAGE OF AMERICANS WHO OWN SMARTPHONES

Snapchat MOST POPULAR IOS APP

Obama NO.1 MOVIE OF THE YEAR PRESIDENT

Foursquare grew revenue 74% yearover-year in 2016

JANUARY 14 Foursquare raises a \$45 million in Series E led by Union Square Ventures; announces Jeff Glueck as new CEO

**FEBRUARY 22** Foursquare launches Attribution to measure ad effectiveness

MARCH 9 AlphaGo, a computer program created by Google's DeepMind, wins a go game against international champion player Lee Sedol

MARCH 28 Oculus, the first massmarket VR headset, makes its debut

**APRIL 12 Foursquare predicts** Chipotle's Q1 sales figures (and nails it, as is proven two weeks later)

APRIL 28 Snapchat receives 10 billion daily video views

MAY 18 Google launches the Google **Assistant** 

MAY 24 Foursquare launches Marsbot, a context-bot from Foursquare's R&D lab

MAY 25 Foursquare announces partnership with **Uber** to help power locations

JULY 6 Pokemon Go, the AR video game, launches



imposed sanctions on Theranos, including a bar on Elizabeth Holmes owning or operating a medical laboratory for at least two years

JULY 22 The final videocassette recorder (VCR) is manufactured

JULY 25 Foursquare launches a live Attribution dashboard to give advertisers direct access to daily foot traffic updates; announces 55 partners

JULY 29 Tesla holds a grand opening for the Gigafactory outside Reno, Nevada, where it will produce its lithium-ion batteries. The factory is projected to be one of the largest buildings in the world

**AUGUST 1** Instagram lauches "Stories" feature on the platform

**AUGUST 4** Foursquare uses its data to show that Trump-branded hotels,

casinos and golf courses have lost 14% market share over the past year (and 30% amongst women in "blue" states)

**SEPTEMBER 2** Samsung recalls its Galaxy Note 7 smartphone, owing to a manufacturing defect that led to battery overheating, causing phones to "explode"

OCTOBER 1 Google launches Pixel, "the first phone made by Google inside and out"

NOVEMBER 4 Google Home, the smart speaker system, is released

NOVEMBER 8 Donald Trump wins the U.S. Presidential election

**NOVEMBER 15** Foursquare announces partnership with Snap to power geofilter locations in Snapchat

**DECEMBER 1** Google X becomes **Waymo**, a self-driving car tech company

**DECEMBER 9 Nielsen** and Foursquare partner to tie digital ads to in-store visits

37

**DECEMBER 12 Kendall Jenner, Emily** Rataikowski, Bella Hadid and others post Instagram promotions of the firstever Fyre Festival

**DECEMBER 16** Foursquare releases report on What America Ate, Drank and Saw in 2016; visits to sports bars are up 23% in the run-up to the Chicago Cubs' World Series win

69b SMARTPHONE DEVICES SOLD IN THE U.S.

77% PERCENTAGE OF AMERICANS WHO OWN SMARTPHONES

Star Wars VIII

Snapchat MOST POPULAR

NO.1 MOVIE OF THE YEAR

PRESIDENT

Foursquare grew 50% year-over-year in 2017

JANUARY 21 The Women's March is the largest single-day protest in U.S. history. The event started with a post to Facebook, made just after the

JUNE 16 Foursquare hires Jeff Glueck as COO

2016 presidential election, and led to hundreds of events across the country

**FEBRUARY 14** Foursquare named one of Fast Company's Top Ten Most Innovative Companies in Data Science

MARCH 1 Foursquare launches Pilgrim SDK; developers can use our core technology to understand where phones go

MARCH 20 Foursquare launches **Analytics**, a dashboard for retailers

MAY 16 Foursquare named one of CNBC's Top 50 Disrupter companies

MAY 30 Foursquare partners with **Reddit** to include front page geotags

MAY 31 President Trump tweets "Despite the constant negative press covfefe"; baffles nation

JUNE 1 Mobile banking app Zelle launches

JUNE 16 Amazon announces the purchase of Whole Foods in a deal valued at about \$13.7 billion

JUNE 6 White House press secretary **Sean Spicer** declares that President Trump's tweets are "official statements" of the government

JUNE 21 Snapchat launches location service Snap Map

JUNE 21 Uber CEO Travis Kalanick resigns

JULY 7 The U.N. signs the first legally binding international agreement to prohibit nuclear weapons

JULY 7 Tesla's Model 3 sedan debuts

JULY 12 Foursquare and Pandora partner to measure real-world impact of internet radio ads

JULY 21 The online video game Fortnite is released

JUNE 1 The European Union levies JULY 17 A lawsuit is filed by seven Google with a \$2.7B antitrust fine. Twitter users who were blocked Google denies the accusations by President Trump's account,

claiming that the block is a violation of constitutional and First Amendment rights

**AUGUST 17** Foursquare announces 12 billion check-ins

SEPTEMBER 1 Juicero, the start-up that created a \$700 "smart juice" machine, shuts down, signaling shifting public opinion towards Silicon Valley

SEPTEMBER 27 Amazon adds Alexa services to all BMW and Mini vehicle models for 2018

OCTOBER 3 It is revealed that 3 billion Yahoo! accounts were hacked in a massive data breach in 2013, changing how the world views privacy

**OCTOBER 10** Foursquare announces partnership with Snap to create **Context Cards** 

**OCTOBER 11** Facebook releases the Oculus Go virtual reality headset

OCTOBER 25 Google's Alappears to be **homophobic and racist** as demonstrations of the company's Cloud Natural Language API reveals

**NOVEMBER 1** Snapchat changes Stories from **chronological to algorithmic** ordering, inciting backlash

NOVEMBER 3 Apple launches the iPhone X, retailing for \$1,000, alongside a slew of phones that are all screen

NOVEMBER 13 Foursquare named one of AdAge's Best Places to Work

**NOVEMBER 16** Foursquare releases Black Friday data around the impact of opening hours on holiday foot traffic

**DECEMBER 6** Amazon announces Prime Air, an autonomous drone delivery service for Prime members

**DECEMBER 14** Foursquare founder Dennis Crowley speaks with other tech companies and Chuck Schumer against the repeal of net neutrality

**DECEMBER 14** The Trump administration repeals the U.S. FCC's net neutrality rules

**DECEMBER 15 AIM** shuts down after 20 years

79b 77% SMARTPHONE PERCENTAGE OF AMERICANS WHO OWN DEVICES SOLD IN THE U.S. SMARTPHONES Avengers: Infinity War Bitmoji NO.1 MOVIE MOST POPULAR IOS APP

JANUARY 22 Amazon opens its first cashier-less store, Amazon Go, in downtown Seattle

OF THE YEAR

Trump

PRESIDENT

FEBRUARY 1 Google parent company Alphabet tops \$100 billion in sales

MARCH 5 Foursquare files a petition with the U.S. government in favor of net neutrality

MARCH 10 Steve Wozniak says he's sticking with Swarm because Foursquare is an ethical tech company

MARCH 13 Trump fires Secretary of State Rex Tillerson via a tweet

MARCH 14 Theoretical physicist Stephen Hawking, author of A Brief History of Time, dies at 76. His ashes are interred at Westminster Abbey next to the grave of Isaac Newton

MARCH 17 The Guardian and the New York Times report that 50 million Facebook profiles were harvested for Cambridge Analytica

MARCH 18 The first self-driving car fatality is reported, as a pedestrian in Arizona dies after being struck by an autonomous vehicle

**APRIL 1** Snapchat reverts back to chronological ordering of stories after harsh backlash

APRIL 10 Facebook CEO Mark Zuckerbera testifies before Congress. America realizes that Congress has a lot to learn

APRIL 26 Foursquare unveils Sixteen, its in-house creative studio to power location-aware advertising

MAY 16 Foursquare launches campaign to win Senate votes to save net neutrality (and wins!)



### **BETHANY CRYSTAL**

General manager, USV Network at Union Square Ventures, a venture fund that's invested in Foursquare since our Series A.

"Ten years ago, 'meeting someone' via Twitter held an aura of mystique and wonder to it. We marveled at the power of technology for connecting us with people we'd never otherwise know. As a result, we saw this behavior manifest in many of the consumer-facing web applications of that era (Tumblr, Kickstarter, Stack Overflow and SoundCloud, to name a few), many of which were designed to build digital-first networks and interaction models. However, after a decade of this 'avatar approach,' I've noticed almost the inverse to be true now. Rather than deepen these online-only networks, companies and organizations today use technology to better leverage IRL ('in real life') communities. So, what's changed in 10 years? Maybe not much at all. We're still craving connection and community; we're just looking for it in different places."

MAY 23 Foursquare announces that it will be powering Tinder Places

MAY 25 The E.U.'s General Data Protection Regulation (GDPR) goes into effect, designed to modernize privacy laws for European companies and those doing business in the European Union. Updated privacy policy emails proliferate

MAY 30 Foursquare announces that it is now the primary location service provider for Mapbox

JUNE 28 Foursquare releases report on the Surviving the Retail Apocolypse

JULY 1 Google Drive reaches 1 billion users

JULY 27 Facebook loses \$119 billion after revelations about its involvement with Cambridge Analytica, the biggest one-day drop in history of the U.S. stock market

AUGUST 2 Apple becomes the world's first \$1 trillion company

**AUGUST 29** Foursquare announces the use of Pilgrim SDK to power AccuWeather

**SEPTEMBER 16** Foursquare announces the Foursquare for Good program to find the next ideas that will change the world

**OCTOBER 2** Foursquare announces Series F funding

**NOVEMBER 1** Foursquare announces partnerships with TripAdvisor, Hilton and Conde Nast Traveler

**NOVEMBER 1** Amazon announces that Alexa is available in 41 countries

NOVEMBER 1 In a double murder trial, a New Hampshire judge ruled that authorities could examine recordings from an Amazon Echo recorded in the victim's home

**NOVEMBER 7** Foursquare brings Attribution to TV through Inscape partnership

NOVEMBER 15 Elon Musk's SpaceX wins FCC permission to launch more than 7,000 internet-beaming satellites

**NOVEMBER 27** Foursquare announces first-ever Foursquare for Good winner, Objective Zero

DECEMBER 2 7-year-old boy Ryan of Ryan ToyReviews becomes the highest paid YouTuber, with an estimated net worth of \$22 million

DECEMBER 13 Virgin Galactic completes its first sub-orbital consumer spaceflight

**DECEMBER 21** Google announces plans

NOVEMBER 15 Foursquare's launches Tech Ethics training with David Ryan

**DECEMBER 3** Hip-hop country star Lil Nas X releases one of the year's biggest hits, "Old Town Road," on TikTok and becomes a viral hit sensation with 2.3 billion streams

DECEMBER 31 Bitcoin ends 2018 with the worst loss in the company's history, with the value spiraling down to under \$4,000, from \$20,000 in December 2017

77.5% SMARTPHONE

81% PERCENTAGE OF DEVICES SOLD AMERICANS WHO OWN IN THE U.S.

YouTube MOST POPULAR

Avengers: Endgame NO.1 MOVIE OF THE YEAR Trump

U.S. President

JANUARY 1 Amazon announces that it has sold over 100 million Alexaenabled devices

JANUARY 9 The first 1TB SD card is made commercially available by Lexar

**JANUARY 22** Foursquare launches Pinpoint audience segments; signs MillerCoors as first alcohol partner

MARCH 5 Forbes names Kylie Jenner the world's youngest self-made billionaire, built by her Instagram influencing empire

MARCH 8 Foursquare asks, "Is it Creepy or Cool?" and unveils Hypertrending at SXSW, showing anonymized visits in Austin, in real time

MARCH 13 The U.S. grounds all Boeing 737 MAX jets due to problems with the planes' automated stabilization system

MARCH 18 The SEC seeks a contempt order after **Elon Musk** makes a Twitter announcement regarding Tesla's production capacity

APRIL 2 Google+ is officially shut down

APRIL 3 The first 5G mobile networks launch in the U.S. and South Korea

APRIL 11 It is revealed that Amazon workers internally listen to and share conversations recorded via Amazon's Alexa service



### **NOAH PARNESS**

Junior at Francis Lewis High School in Queens, NY and son of Rory Parness, Foursquare CFO

"I think when Instagram launched in 2010, it had a really big impact. I downloaded it in 2016 when I was in 8th grade and got my first smartphone. I thought it was cool to see what other people that I knew and even those I didn't—were doing. Instagram created a platform for people to share their life experiences, communicate and connect with others. In school, students talk about posts, and we bond over experiences we share through Instagram. The platform has helped create a new 'online culture' for people of all backgrounds, and has exposed millions—especially teens like me—to new places and ideas we may not have been exposed to before."



### DAVID GODYCKI

Foursquare's new **Creative Director** 

"What has changed us the most is the democratization and decentralization of information. Before Twitter, Instagram, Airbnb, Kickstarter, Foursquare...the informed opinion resided with large companies, official organizations, media and publishers. Today, the valued opinion resides with the individual: be it an influencer, a host on Airbnb, an inventor crowdfunding on Kickstarter or the community of Foursquare superusers who maintain our places database. The past 10 years have seen an incredible shift in the power of influence."

MAY 21 Oculus Rift, the virtual reality headset, is released

MAY 31 Foursquare announces \$150 million investment led by the Raine Group; acquires Placed. David Shim becomes President

JULY 30 NASA partners with 13 privately-held space companies including SpaceX and Blue Origin on research and development tech projects

SEPTEMBER 24 Adam Neumann steps down as WeWork CEO. Some argue that those building a lasting tech company with solid economics will be rewarded

**OCTOBER 2 Foursquare launches** Pilarim SDK free tier for users with fewer than 100,000 MAU

OCTOBER 16 Foursquare CEO, 2016-2019, Jeff Glueck pens op-ed on why we need Congress to regulate location data

### Looking at the Global Climate Strike September 20th, 2019

This year's largest climate strikes, as seen through the lens of Foursquare Hypertrending, a demo app we launched for two weeks during SXSW 2019. The technology uses our Pilgrim SDK for a top-down look at where phones are in real time.





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