SOCAL TECH EXPERTS EXAMINE THE IMPACT OF TECHNOLOGY TRENDS ON BUSINESS AND BEYOND

Plus: What new technology they think will take off big time, what's cool, and what has changed their lives personally

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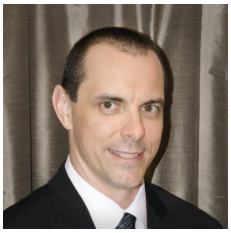
No matter what business you're in, technology is changing how you interact with customers, how you become more efficient, and ultimately how you stay competitive.

We spoke to five technology experts in different industries – from software development to city government – and discovered many of them are dealing with similar challenges. We asked them what technology trends were having the greatest impact on business overall as well as on their industries, and what cool trends they thought were taking off outside of their industries.

Along the way, we learned what technologies might surprise the public (it's not all good), what new technologies excited them, and what impact new technologies have had an impact in their personal lives.

Photo by: halfrain

TECHNOLOGY TRENDS THAT ARE DRIVING CHANGE



"You are seeing new companies that have leveraged digitalization to disrupt long-established industries and existing leaders struggling to keep up."

- Steve Plank , VP of Global Information Services for Allergan

1. Mobile

Hands down, mobile is changing everything.

The city of San Diego, for example, is grappling with the expectations on the part of the consumer. "They expect Apply Pay and Google Wallet," said Jonathan Behnke, chief information officer (CIO) for the city of San Diego. "We have 400 applications here in the city, and it takes us a while to get all those things in the mobile world."

For Greg Spillane, chief operating officer at Events.com, a software provider for event organizers, it has changed software development. "A lot of people, when they thought of mobile, went to responsive design, which was basically taking a web page and allowing it to scale well on any type of device."

But that doesn't take into account how people interact with mobile, such as using touch rather than a mouse. Events.com develops its software "100% mobile first," he said. "Then we scale our applications up to work on a desktop."

The digital experience of customers and consumers "will ultimately decide which companies win and lose in nearly every industry, " said Steve Plank, VP of Global

Information Services for Allergan, who noted that he was not speaking on behalf of the pharmaceutical company for this article. “You are seeing new companies that have leveraged digitalization to disrupt long-established industries and existing leaders struggling to keep up.”

Photo by: Kārlis Dambrāns

As an example, he mentioned Uber, which connects riders to drivers with an app and is giving traditional taxis a run for the money. The need to move people from place to place — and the taxi business — has existed for a long time. Then, he said, “A new company pops up, leverages technology to radically improve the user’s experience, and turns a very traditional, long-standing industry on its head.”

Clearly, while a new technology may add convenience to our lives, it impacts existing businesses and jobs, according to Robb Good, consulting chief technology officer (CTO) for the construction company C.W. Driver .

Good pointed out that his smartphone and all its apps are replacing consumer products, such as cameras, alarm clocks, address books, calculators, maps and games. Payment options, such as Apple Pay, Square, and Venmo, mean that he rarely carries his wallet or cash. And as state governments move toward electronic driver’s licenses and ID cards, his wallet will become an antique.

“This has huge ramifications for all these consumer product companies and the related companies supplying the packaging, shipping, repair and maintenance services,” he said. Combine this with driverless cars and manufacturing automation, and he seriously wondered “what a lot of people will be doing for work 10 years from now.”

2. Big Data And Analytics

As companies grow, they inevitably develop more processes and manage more data. For Wade Williams, VP for Engineering of Paylease, an online payment processor for property managers and homeowners’ associations, he’s analyzing lightweight tools such as Qlikview, Looker, and others that can provide actionable analytics without the investment of expensive software or the increased headcount needed to run more traditional business intelligence (BI) solutions like Cognos or Jaspersoft.

Since he started at Paylease four years ago, the company

has grown from 20 people to about 130. “We have a lot more business processes, a lot more customers and data, and we are in need of more detailed reports on the corporate dashboard to be able to effectively manage our business.”

Actionable analytics, Williams explained, will help him deliver more real-time reports to his business colleagues and stakeholders. Such reports could include valuable data for the marketing, sales, and finance departments, providing real-time data to enable them to be more responsive to clients, focus their resources, and improve processes.

In the life sciences and healthcare industries, Plank of Allergan said data technologies, particularly some of the data virtualization technologies, no longer require big data warehouses. “In hours, you can pull together data from very diverse sources — in some cases data that wouldn’t have been available five years ago — and gain insights or predict outcomes.”

3. The Cloud

The cloud allows you to put an infrastructure in place that is able to scale to millions of users very rapidly. And it's a game changer for companies both big and small.

Good said start-ups can "quickly and cheaply build a whole infrastructure in the cloud that rivals anything an established company has. Plus, you don't need an IT team on staff to support it."

By putting services in the cloud, the staff size of company IT departments is constantly being reassessed. Good said there are whole categories of IT services today that he

would not even consider trying to host or provide in-house because those services are now being offered as commodities by hosting providers.

It's one of the reasons he doesn't encourage college kids to go into IT management.

Spillane of Events.com agreed that the impact of the cloud is huge. He gave an example of companies with online shopping carts or ecommerce platforms who might do 1,000 transactions a day, but during the Christmas season might do 1 million transactions. Without the cloud, such a company would have to pay for the physical infrastructure that would support 1 million transactions 365 days a year.

With the cloud, he said, you can "create very elastic systems that are in place, the automation is all there, and that allow you to scale up very quickly." This ensures that companies can be more responsive rather than having to make large capital investments up front.

4. Open Data And Open Source

Open data technology and online services are having a big impact on government, according to Behnke of the city of San Diego.

Large cities, including the city of San Diego, have open data initiatives "to be more open and transparent with the public in how they spend public funds and show the efficiencies that they've been able to put together in the delivery of services."

One efficiency he knows citizens expect is online services, which would mean that citizens wouldn't have to call a number or sit on hold and wait for someone to answer. Instead, people could get the answers they need and be on their way.

Behnke said the city has completed an open data policy and is working with Code for America, an organization whose mission is to facilitate government's use of open source technology to make city services more user friendly.

"That relationship is helping to introduce some great ideas for open source tools and how the city can leverage those not only for open data, but also for our day-to-day services."

As government leverages open data, you'll see expanded use of open-source software such as Drupal, Hadoop and Pentaho. For example, the White House relaunched its website on Drupal [1], and announced the administration's fiscal budget 2016 on GitHub.[2]

"There's a lot of talent out there," Behnke said. "You go to any web development shop and everyone knows Drupal."

Photo by: NEC Corporation of America

TECHNOLOGY TRENDS THAT WOULD SURPRISE THE PUBLIC

"We are quickly approaching the age where every device in your home, car, or office is communicating with other devices, an Internet server, a satellite, or worse, a hacker."

- Steve Plank , VP of Global Information Services for Allergan

1. The Amount Of Data Collected

It's so convenient to go to a website requiring a log-in and use your Facebook, Twitter or Google+ account instead of creating a new login and password, right? But that convenience, called single sign-on, isn't entirely for your benefit.

Photo by: Sean MacEntee

"I don't think a lot of people realize that when they do that, there's actually an exchange of information between both those parties," such as email addresses and friend contacts, Spillane said.

And that's only part of the picture. What you do on your mobile device, what your habits are, where you go and what you're into are so well mapped out that an organization can completely profile you, Spillane said. Then, based on your profile and profiles of millions of people like you, companies can then serve up products and services that are relevant to you.

You can consider that convenient, or, on the other hand, a little creepy.

According to Plank, the public would be surprised at how much control they're losing over their personal information. "This balance of giving up information for a benefit isn't fully understood," he said. And he's not sure where people would draw the line if they did understand. "It will be interesting to see if the next generation, which

only knows a digital world, will be more willing to give up privacy for convenience."

We've all heard about the latest security breaches, from Target to Home Depot and Sony Pictures. [3] But the public probably doesn't understand the complexity of cybersecurity attacks either, which put that data at risk. "No CIO today can give their board a guarantee against a successful attack," Plank said. "To think of an analogy, you are trying to protect the entire house, and the infiltrators only need to find the smallest of cracks."

2. The Internet of Things

Related to big data is the Internet of Things. That means non-intelligent items that can communicate with other items by sending data and receiving it, such as your smart meter recording your energy consumption and providing that information directly to a utility company's data center.

"We are quickly approaching the age where every device in your home, car, or office is communicating with other devices, an Internet server, a satellite, or worse, a hacker," said Plank.

"The potential for real chaos is possible if the majority of the devices share the same vulnerability and are all connected to each other."

Manufacturers aren't taking this as seriously as they should, he said, with so many products being rushed to market.

But there are positive implications for the Internet of Things. "The opportunity of using the Internet of Things, collecting data off machinery to do proactive maintenance, has a tremendous potential return on investment and the manufacturing world," said Spillane.

At a previous company, he helped analyze data for an elevator manufacturer to look for patterns and figure out predictors for failures and maintenance. While most of us may see an elevator as something that, at the push of a button, takes you up or takes you down, predictive analytics and the Internet of Things change the equation.

"Now, all of the sudden, you have that elevator transmitting millions of bytes of data to the cloud on a daily basis," he said. And you have another computer running an analysis and creating trigger points so that a technician can know that a problem is pending."

This technology will also improve traffic. For example, Behnke said the city of San Diego is looking at initiating a pilot for smart traffic signals that can help alleviate congestion and keep cars moving, such as after a Padres game downtown, using real-time traffic data.[4]

3. Nanotubes

Nanotubes are opening up a whole new dimension of what computing can be and what it can do, according to Williams of Paylease. Nanotubes are very small tubes, about one nanometer in diameter, that contain carbon atoms and molecules, are organized three-dimensionally, and are capable of performing logic dates and memory storage. How tiny is one nanometer? To give you an idea, one sheet of paper is 100,000 nanometers thick.[5]

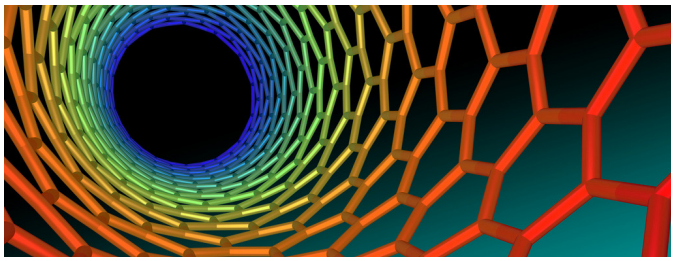


Photo by: Geoff Hutchison

Nanotubes are being used in the development of next-generation circuit technology, which means we're moving away from silicon-based microchip technology, he said.

"This technology is not new – it started in 1991 – but it has the potential to gain traction in flexible circuits, such as bendable paper and other devices," Williams said.

Photo by: Kārlis Dambrāns

TECHNOLOGY THAT'S GOING TO TAKE OFF

"(Vehicle telematics) will improve safety with features like automatic parking and cars talking to each other wirelessly to prevent traffic accidents."

- Wade Williams , VP for Engineering of Paylease

1. 3-D Printing

3-D printing technology is rapidly advancing, according to Plank. "In some cases, we probably don't even know where it's being used for companies to gain advantages," he said. 3-D printing is becoming more affordable, and he predicted it wouldn't be far off when people can print off replacement parts for machines, ultimately changing how traditional businesses keep parts. He said it won't be long until you can print components on-demand, ultimately changing how businesses keep inventory or deliver parts.

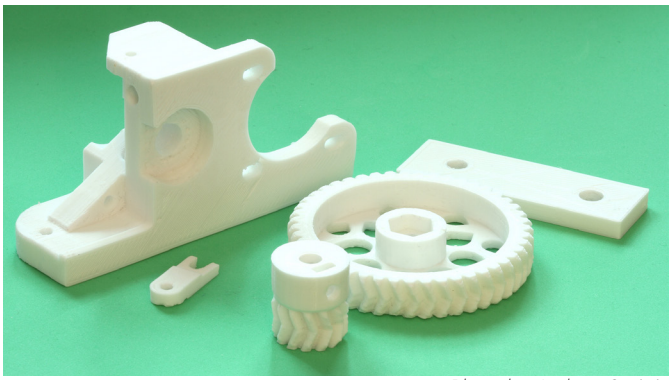


Photo by: Andrew Craigie

This will drive significant supply-chain benefits in terms of speed and working capital. Eventually, 3-D printing will come into the home, too.

2. In-Memory Databases

In-memory databases (IMDBs) have been around for a couple of years, said Behnke, but they will change how computing is done. “I look at enterprise resource planning systems like SAP, and in-memory databases really hold the potential for eliminating batch jobs that most companies have taken for granted in a business warehouse.”

IMDBs store data in the computer’s main memory rather than relying on disk storage. “Instead of having an operation that’s running batch jobs in a data center somewhere, you can simply have a scheduling tool kick off all of your batch jobs and finish them in 5 minutes and manage the exceptions,” he said.

3. Wearables

There will be an expanded use of wearables, according to Williams. “Fitbit, Google, Pebble, Sony, Samsung, Jawbone – lots of companies are all building these devices,” he said. “Many of them are building smart watches as well.”

Wearables tied into the healthcare industry are also garnering more attention, according to Plank, especially as they may help people better comply with medical directives they’ve worked out with their physicians.

Photo by: US CPSC

4. Vehicle Telematics

Every vehicle is going to come off the line with technology that’s going to revolutionize transportation, Williams predicted.

Instead of just infotainment, which can provide in-vehicle navigation systems, connect with your smartphone connectivity, and play audio and video, “it will improve safety with features like automatic parking and cars talking to each other wirelessly to prevent traffic accidents,” he said. While such features already exist in high-end vehicles, such as Lexuses and BMWs, they will become more ubiquitous in less expensive cars.

Photo by: Falcon Photography

As an example, he mentioned that the January 2015 International Consumer Electronics Show held in Las Vegas had its biggest automotive section in the event’s history. Before, virtually no automotive companies participated, but once Microsoft partnered with Ford on the Sync project[6] on hands-free infotainment technology (Ford has since dumped Microsoft for Blackberry’s QNX operating system[7]), the automotive industry started showing up, taking up about 20 percent of the showroom floor, he estimated.

Photo by: Aurimas

NEW TECHNOLOGY THAT'S REALLY EXCITING

"It takes the Teddy Ruxpin doll to the next level. You can ask it anything. It learns and continues to improve. It knows your child. It knows your children's habits."

- Greg Spillane, Chief Operating Officer at Events.com

1. Natural Interfaces

Interacting with computers in a more natural way is what intrigues Plank. "We've been living with computers for decades now," he said. "Whether it was keystrokes on a green screen or point and click, all of those were learned interfaces."

Now we're more often talking in regular terms to a computer and getting something back. Imagine going to a mall, and instead of looking at that old-school directory to locate the nearest Brookstone, you ask a computer for directions and it tells you or shows you.

Other ways to interact with a computer are body recognition and movement recognition, much like the Fitbit. "It becomes a more natural way that you're going to interact with computers, and in some cases, you'll be interacting with them and you won't even know it," Plank said.

2. Artificial Intelligence

What holds the most interest for Spillane is artificial intelligence (AI), such as the advances in self-driving cars. "You look at what Google is doing, you look at the money Google's invested in a company like Uber. And then you look at what Uber has been able to do and how they've been able to disrupt the transportation industry."

AI is even touching children's toys, such as a toy dinosaur that uses the IBM Watson machine learning system.[8] As you may remember, Watson was a big hit on Jeopardy in 2011 when it beat the show's smartest contestants.

Photo by: A Health Blog

"IBM took that technology and offered it to commercial use so organizations could access the underlying technology and do different things with it," Spillane said. The dinosaur is part of a CogniToys line developed by Elemental Path, which recently launched a Kickstarter campaign to fund additional development.

"It's a toy marketed toward children that's connected to the cloud," Spillane explained. Imagine SIRI, but with more intelligence that allows children to interact with the toy.

"It takes the Teddy Ruxpin doll to the next level. You can ask it anything. It learns and continues to improve. It knows your child. It knows your children's habits."

Spillane admitted that when a machine knows your child too well, "it's kind of creepy, frankly. But the technology behind it is very fascinating."

3. Advances In Medical Science Devices

Remember the tricorder device from 'Star Trek' that Dr. McCoy waved over someone's body to determine what ailed them? The real-world version is what excites Williams. Teams on the tricorder XPRIZE project supported by Qualcomm are trying to create just that– a wireless device that "monitors and diagnoses your health conditions," according to Qualcomm. [9]

"It's just an example of some of the work that will revolutionize medical diagnosis and care," Williams said.

4. Virtual Reality

For Behnke, it's virtual reality (VR) headsets, such as the Oculus Rift, and the Microsoft HoloLens, that pique his interest. This VR technology has great potential for police training, military training, and pilot simulators, and could be used for engineering solutions and design work, as well as a "host of other applications that really can save significant dollars from their real-world counterparts," he said.

Photo by: Sergey Galyonkin

5. Alternative Payment Platforms

Plank, who described himself as somewhat of a finance geek, likes what he sees in terms of crypto currency, including Bitcoin, and how these new currencies will be disruptive. "I think there are some capabilities that need to be added to really make it go mainstream, but it surprises me that, day in and day out, more and more companies are adopting or accepting that currency."

Photo by: NEC Corporation of America

NEW TECHNOLOGY THAT THEY USE IN THEIR PERSONAL LIVES

"I think we've gotten to the point now that we're truly living the promise where all of our data is now housed up in the cloud and it's accessible by any device."

- Greg Spillane, Chief Operating Officer at Events.com

1. Cloud Mobility

The cloud has allowed Spillane to access any piece of data, at any time, in any place, via his smartphone. "With Amazon, all my photos are in the cloud, all my content sits in the cloud, all my books, all my music, all my videos. I'm never away from any piece of information that I want. We're getting close to that point where it's not necessarily about the device as much as it's about your access to your accounts."

He said he could lose his phone tomorrow, but he could enter his Gmail account, his Facebook account, etc., and have all that information available.

"I think we've gotten to the point now that we're truly living the promise where all of our data is now housed up in the cloud and it's accessible by any device."

2. Social

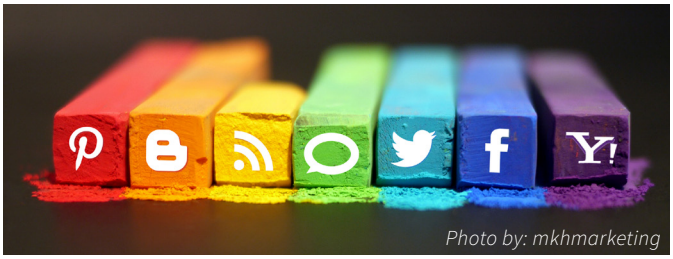


Photo by: mkhmarketing

While Plank uses many of the new technologies, it's social that sticks out in his mind when it comes to his personal life. Since he grew up on the East Coast and

now lives on the West Coast, social has enhanced his family relationships, whether it's FaceTiming with the grandparents or posting pictures on Facebook. "My kids would not have the same relationship with their family without these capabilities.," he said.

3. Home Automation

Behnke has installed home automation, such as automatic controls for the lights and the thermostat. He even uses home automation to wake up his teen-age and college-age kids for school.

"I put motion detectors in their bedrooms," he said. "And I have a speaker go off that tells them to get up for school, and if the motion detector doesn't detect any motion in their room, it starts flashing the lights and giving them verbal cues to get them rolling."

He also installed motion detectors in the bathrooms that shut off the lights after eight minutes.

"If they're in the shower too long, using our precious California water, the light shuts off. And they have to throw a bar of soap or something to have the motion detector turn the lights back on."

"I tell you, after installing that technology, my power bill did actually go down."

EVERY COMPANY IS A TECHNOLOGY COMPANY

It appears that no matter what industry you're in – biotech, government, or software development – technology is changing the competitive landscape. In order to thrive, organizations have to become more efficient in their processes and be hyper responsive to customers. What's on the horizon – the ability for devices to communicate with each other and the new ways we communicate with our devices — brings incredible opportunity, and at the same time, the need for increased security to protect our data.

Any organization that uses technology to interface with customers online, facilitate the delivery of a product or service, or improve its internal processes, can no longer be simply categorized as a biotech company or a banking institution, for example.

"At this point, it's very hard to find a company that shouldn't consider itself a digital enterprise," Plank concluded.

ENDNOTES

[1] Drupal announces Whitehouse.gov relaunches on Drupal: https://www.drupal.org/whitehouse-gov-launches-on-drupal-engages-community

[2] View the budget on GiftHub: https://github.com/WhiteHouse/2016-budget-data

[3] Network World sums up the worst security breaches of 2014: http://www.networkworld.com/article/2861023/security0/worst-security-breaches-of-the-year-2014-sony-tops-the-list.html

[4] A Government Technology interview with San Diego City Mayor Kevin Faulconer: http://www.govtech.com/fs/news/Smart-City-QA-with-San-Diego-Mayor-Kevin-Faulconer.html

[5] The National Nanotechnology Initiative:http://www.nano.gov/nanotech-101/what/nano-size

[6] Information about the Ford Sync project: http://www.ford.com/technology/sync/

[7] As reported by Lucas Mearian in Computerworld: http://www.computerworld.com/article/2859373/ford-dumps-microsoft-for-qnx-unleashes-new-functions-in-sync-v3.html

[8] As reported by Davey Alba on Wired.com: http://www.wired.com/2015/02/cognitoys-ibm-watson

[9] Qualcomm Tricoder XPRIZE: http://tricorder.xprize.org/.

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