10 CEOs
Who Are Transforming
Business Through
TECHNOLOGY

Gary Shapiro
President & CEO
CTA, Producer of CES

William Ruh
CEO
GE Digital

Mike Gregoire
CEO
CA Technologies

Julie Myers Wood
CEO
Guidepost Solutions

James E. Heppelmann
President & CEO
PTC

Rich Riley
CEO
Shazam

Jay Walker
Founding CEO
Upside & Priceline.com

Igor Khmel
Founder & CEO
BANKEX

Erik Anderson
Executive Chairman
Topgolf

The CEO Forum - June 2018
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# Table of Contents

## THE INTERVIEWS

<table>
<thead>
<tr>
<th>Page</th>
<th>Name</th>
<th>Title</th>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>Gary Shapiro</td>
<td>President &amp; CEO</td>
<td>CTA™ &amp; Producer of CES®</td>
</tr>
<tr>
<td>18</td>
<td>William Ruh</td>
<td>CEO</td>
<td>GE Digital</td>
</tr>
<tr>
<td>24</td>
<td>Mike Gregoire</td>
<td>CEO</td>
<td>CA Technologies</td>
</tr>
<tr>
<td>30</td>
<td>Julie Myers Wood</td>
<td>CEO</td>
<td>Guidepost Solutions</td>
</tr>
<tr>
<td>38</td>
<td>James E. Heppelmann</td>
<td>President &amp; CEO</td>
<td>PTC</td>
</tr>
<tr>
<td>44</td>
<td>Thomas Gebhardt</td>
<td>Chairman &amp; CEO</td>
<td>Panasonic Corporation of North America</td>
</tr>
<tr>
<td>50</td>
<td>Rich Riley</td>
<td>CEO</td>
<td>Shazam</td>
</tr>
<tr>
<td>56</td>
<td>Jay Walker</td>
<td>Founding CEO, Upside Travel &amp; Priceline.com</td>
<td></td>
</tr>
<tr>
<td>66</td>
<td>Igor Khmel</td>
<td>Founder &amp; CEO</td>
<td>BANKEX</td>
</tr>
<tr>
<td>74</td>
<td>Erik Anderson</td>
<td>Executive Chairman</td>
<td>Topgolf</td>
</tr>
</tbody>
</table>

## BOOK REVIEW

<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
<th>Author(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>36</td>
<td>The Driver in the Driverless Car</td>
<td>Vivek Wadhwa</td>
</tr>
<tr>
<td>64</td>
<td>Subscribed</td>
<td>Robert Reiss</td>
</tr>
</tbody>
</table>

## CEO INSIGHT

<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
<th>Author(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>62</td>
<td>Positioning in a Digital World</td>
<td>Laura Ries, President, Ries &amp; Ries</td>
</tr>
<tr>
<td>72</td>
<td>Are You Already Techno-Illiterate?</td>
<td>Nancy May, President and CEO, BoardBench Companies</td>
</tr>
</tbody>
</table>

## EXPERT ADVICE

<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
<th>Author(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>How Blockchain Could Turn HR Into Your Competitive Advantage</td>
<td>Elizebeth Varghese, IBM Partner &amp; General Manager Talent &amp; Engagement</td>
</tr>
<tr>
<td>80</td>
<td>How Digital Technology Can Turn Customers into Fans</td>
<td>Arthur Filip, Chief of Sales Transformation and Marketing, HCL Technologies</td>
</tr>
</tbody>
</table>
In a world where change is certain, experience is the best protection.
A few days ago I was speaking with Terry Jones, founding CEO of Travelocity and Kayak, and he told me something that clarified the true nature of digital transformation. He said, “When people are attacking your business and taking away market share, it is called disruption; however, when you are the one driving the change it is innovation.” This sentence to me summarizes change and reinforces why we put together this special edition of The CEO Forum magazine – 10 CEOs who are transforming business through technology.

In our first interview, Gary Shapiro, CEO of Consumer Technology Association and also the leader of the world’s largest technology conference, CES, with 180,000 attendees with 66,000 C-suite executives and 1,000 speakers, explains the true state of technology. Bill Ruh, CEO, GE Digital, explains how AI is impacting manufacturing. He also shares important insights on how to attract and retain top technology talent.

Mike Gregoire, CEO of CA Technologies, discusses his vision for the ‘application economy’ and building agile businesses as well as the leadership principles needed to thrive in our digital world. Julie Myers Wood, CEO, Guidepost Solutions, talks about compliance, and shares insights from when she led Immigration and Customs Enforcement for the Department of Homeland Securities. The next topic is augmented reality and how it is changing many industries like financial services, manufacturing, retail and healthcare from the company who is leading the charge in augmented reality, PTC and their CEO, Jim Heppelmann. Heppelmann also shares his insights on strategic repositioning.

Next Tom Gebhardt, CEO, Panasonic North America, outlines how autonomous and electric cars will transform society. Rich Riley, CEO, Shazam, which includes the ubiquitous music app and also the hit TV show Beat Shazam with Jamie Foxx, talks about how to build a global fan base in the digital world. Jay Walker, who has more inventions and patents than practically anyone in the digital world (Priceline.com is just one of them), shares his newest model of Upside.com, which can transform travel, healthcare and other industries. He also talks about the very nature of technology invention.

Then Igor Khmel, founder and CEO of BANKEX, discusses the world he is at the center of changing – bitcoin and blockchain. Our anchor is Erik Anderson, a leader of numerous companies, most recently Topgolf, which is using technology to transform golf from driving ranges to the beloved Topgolf entertainment centers.

My sense is you will gain several ideas from these CEOs on how to build the right business models and team to catapult your organization forward in our new digital world. If you know of any CEOs you’d like us to interview in The CEO Forum magazine, just email me directly.
Consumer Technology Association (CTA)™ is the trade association representing the $351 billion U.S. consumer technology industry, which supports more than 15 million U.S. jobs. More than 2,200 companies – 80 percent are small businesses and startups; others are among the world's best known brands – enjoy the benefits of CTA membership including policy advocacy, market research, technical education, industry promotion, standards development and the fostering of business and strategic relationships. CTA also owns and produces CES® – the world’s gathering place for all who thrive on the business of consumer technologies. Profits from CES are reinvested into CTA's industry services.

GE Digital is the leading software company for the Industrial Internet, reimagining industry’s infrastructure by connecting software, apps and analytics to industrial businesses to drive a Predix-powered world. GE Digital creates software to design, build, operate and manage the entire asset lifecycle enabling industrial businesses to operate faster, smarter and more efficiently. For more information, visit www.ge.com/digital.

CA Technologies (NASDAQ:CA) creates software that fuels transformation for companies and enables them to seize the opportunities of the application economy. Software is at the heart of every business in every industry. From planning, to development, to management and security, CA is working with companies worldwide to change the way we live, transact, and communicate – across mobile, private and public cloud, distributed and mainframe environments. Learn more at www.ca.com.

Guidepost Solutions offers global investigations, compliance and monitoring, and security and technology consulting solutions for clients in a wide range of industries. The expert team at Guidepost provides leadership and strategic guidance to address critical client needs across the globe. With headquarters in New York, Guidepost Solutions maintains offices in key markets including Boston, Chicago, Dallas, Honolulu, London, Los Angeles, Oakland, Palm Beach, Sacramento, San Francisco, Seattle, Singapore and Washington, D.C., and has resources across the globe. Experience guides us. Solutions define us. For more information, please visit www.guidepostsolutions.com.

PTC helps companies around the world reinvent the way they design, manufacture, operate, and service things in and for a smart, connected world. In 1986 we revolutionized digital 3D design, and in 1998 were first to market with Internet-based product lifecycle management. Today, our leading industrial innovation platform and field-proven solutions enable you to unlock value at the convergence of the physical and digital worlds. With PTC, manufacturers and an ecosystem of partners and developers can capitalize on the promise of the Internet of Things and augmented reality technology today and drive the future of innovation. For more information, please visit www.PTC.com.
Panasonic Corporation of North America

Newark, NJ-based Panasonic Corporation of North America is a leading technology partner and integrator to businesses, government agencies and consumers across the region. The company is the principal North American subsidiary of Osaka, Japan-based Panasonic Corporation and leverages its strengths in Immersive Entertainment, Sustainable Energy, Automated Supply Chains and Connected Solutions to provide secure and resilient integrated solutions for B2B customers. Panasonic was highlighted in Forbes Magazine’s Global 2000 ranking as one of the Top Ten Best Regarded Companies for 2017. Learn more about Panasonic’s ideas and innovations at Panasonic.com.

Shazam

is one of the most popular apps of all time, used by hundreds of millions of people to magically connect to the world around them. Building on its pioneering leadership in music identification, Shazam now helps people discover, interact with, and share audio, video, printed or augmented reality content — and lets music fans follow their favorite artists to share in the thrill of discovery. The app has been downloaded over 1 billion times, in over 190 countries, and users Shazam over 20 million times each day. For more information, please visit www.shazam.com.

Upside Business Travel

is the first online travel service built just for business travelers, particularly the “do-it-yourself” (DIY) business travelers who can’t access special pricing or quality customer service. Upside uses big data to make buying business travel easier. By showing great prices, the best flight times, and most convenient hotels, Upside lets business travelers select what works best for them, including rental cars and ride-sharing services like Uber. The company recently received Glassdoor’s Employees’ Choice Award as one of the Top 50 Companies to Work For in America, and is headquartered in Washington, D.C., with offices in Stamford, Connecticut.

BANKEX

is a leading bank-as-a-service enterprise and financial technology firm that utilizes the Proof-of-Asset Protocol to allow asset owners to convert and sell their assets as digital products. Using standardized Fintech solutions, BANKEX aims to bridge the gap between the emerging blockchain sector and traditional finance with neat IT solutions. For more information, please visit www.bankex.com.

Topgolf

pioneered a technology to make golf more fun and engaging. It has emerged as a global sports and entertainment community, connecting people in meaningful ways. Topgolf blends technology and entertainment, golfers and non-golfers, children and adults — to create an experience that makes socializing a sport for everyone. Every venue features high-tech, climate-controlled hitting bays, a chef-inspired menu and Associates eager to help create the moments that matter. Learn more at topgolf.com.
“CES equals more business meetings, more ideas, more people than I could see traveling around the world for six months.”

Robert Reiss: Talk about what about CES® is.

Gary Shapiro: CES is the largest innovation and business event in the world, attracting more C-level executives than any other event. We had approximately 68,000 executives and more than 182,000 industry attendees this year. The show is not open to the public, so it’s the biggest business event of its kind. We had more than 1,100 different speakers and over 4,400 exhibitors. Everyone comes to see the future of innovation – and it’s not just people in the consumer technology industry, it’s also C-level executives from all over the world. They get inspired when they come to CES because they see possibilities. The value of serendipity is what you see and how you inspire. Think about what innovation is: Innovation is putting different thoughts together in new and creative ways, and what attendees see at CES is potential acquisitions and partnerships. Attendees always come back and say, “CES equals more business meetings, more ideas, more people than I could see traveling around the world for six months.”

Consider this to understand the scope: Las Vegas has
“CES is the largest innovation and business event in the world, attracting more C-level executives than any other event. We had approximately 68,000 executives and more than 182,000 industry attendees this year. The show is not open to the public, so it’s the biggest business event of its kind. We had more than 1,100 different speakers and over 4,400 exhibitors. Everyone comes to see the future of innovation – and it’s not just people in the consumer technology industry, it’s also C-level executives from all over the world.”

150,000 hotel rooms. We have more than 182,000 attendees.

It’s a business event – and we invite your audience to look into coming. Go just once and then you’ll see for the following year how you can really take advantage of the event.

If they do want to come, what’s the website they would go to for information?

CES.tech is the website. It’s easy to get to and it’s easy to apply. Those interested should plan ahead – you can begin now by downloading the app. Plan your meetings ahead of time, while leaving yourself some time to explore. We make it very easy to do that.

Is CES like a Davos for technology?

Davos is about thinking and talking to politicians.

If you want a business show, CES is a business event where partnerships and strategic alliances are formed, along with inspiration. It makes a difference in your business.

Tell me about one of the great speakers who was there in 2018.

It’s hard to pinpoint just one when you have more than 1,100 speakers, including speakers from companies such as NVIDIA, Ford and IBM – as well as startups. There is so much there to be inspired by and to learn from.

As an attendee, you’re getting the best speakers in different areas from around the world. It’s not just about speaking when there are over 4,400 different exhibitors – you won’t be able to see everything. When a lot of executives come for the first time, they sometimes call people and say, “Get out to Las Vegas today.” They’ll reach out to their chief technology officer, their business development and sales team, as well as others and they will say, “Come out here. This is a team approach. We have to figure out how to do this next year so we can really take advantage of this. We are going to split up the different categories; you go to this, we go to that and we’ll compare notes every day.” You go to the event with objectives, but you also allow for the opportunity to meet people that you otherwise wouldn’t even know you’re supposed to meet. I have heard hundreds of stories of companies that formed business relationships which changed their bottom line by going to CES.

Talk about Consumer Technology Association (CTA)™ and what’s important to you.

All of our employees are driven by company-wide, measurable goals. One of our measurable goals is to get at least 10 or so independent awards, including a few new awards every year. We are a great place to work and encourage healthy habits among our employees.

As a U.S. association, our members have to be a U.S. or Canadian company to join, but we also own and produce CES, our global business event. We are focused on the competitiveness and the health of the U.S. economy. We believe one of the biggest issues is the deficit. We have never asked the government for money for our own industry, but we’re always out there saying, “We need to change the immigration policy. We need to change the trade policy. We need all these good things to happen,” so our economy can continue to grow, because that’s what is really important for all of the companies doing business in the U.S. – and that’s what drives us.

Promoting innovation is a unique U.S. strength. Why are
we the best in the world at it? Why do we have more unicorn billion dollar startup companies than any other country in the world, probably all put together? It is because we do things right. But at times, we veer off of our guiding principles. Our immigration policies are going in the wrong direction. Our trade policy is going in the wrong direction. We’re kicking immigrants out and not enticing the best and the brightest the way we used to. And we’re putting a barrier around the United States.

But in some ways, we’ve gone in the right direction. We’re getting rid of a lot of burdensome rules. We’ve worked to help change our tax structure – we’ve been working on that for nine years. We have lower corporate tax rates, so we’re doing the right things in some areas, but not in others. Our job is in public policy; it’s in promoting our industry.

It’s also doing a phenomenal amount of market research, which we share with our members. And we developed standards. So, we’re looking at things in so many different areas where there are privacy questions. All of our members who make these great products such as Apple, Fitbit and others can agree in a sense. Our goal is to get there before the government does. The government will regulate it if you don’t do it yourself. Our standards work includes measuring steps, measuring sleep and measuring brain waves. We’re doing all sorts of innovative things to propel industries forward.

If you look at the landscape of the world, China is driving a lot of AI and they have 86 people who have already been gene edited there. Where does the United States fit in when you talk about innovation? What’s the whole layout of the world and America’s role in the future, say for the next two decades?

You’re correct about two things. AI is the future, and China increasingly is the country that we are on a collision course with because China has a different model. It’s a top-down approach from the government. The government tells them what to do in AI and they also restrict freedoms – freedom of the press, freedom to access the internet, freedom of companies to do business there. It’s a totally controlled environment.

The U.S. and democracies in Europe are fighting for a lot of things that China disagrees with, and we’re on a collision course. We have to, in a sense, make sure our policies give us a winning future. What we are doing right in AI is we’re letting companies plot the course. We are not telling them what to do. China is investing in companies and in people – very bright people who are being educated here and then we’re kicking them out. I still think we have the winning hand, because we have companies that are free to explore and to innovate, and we have to make sure our government has the right policies in place. We have to change immigration policies to attract the best and brightest people and get them to stay here after we educate them.

China and the U.S. are adopting different strategies, and artificial intelligence is probably the best example. Americans have legitimate concerns about privacy. We are concerned about displaced American workers. We have to retrain Americans. We have to address these issues. We have to rethink how we educate kids. We have to engage women and minorities and get them into science and technology.

We have to tap into all our diverse talent that we have here, and we have to change what we’re doing in our education system. We have to change our immigration policy and make sure we have good trade policy. We don’t advocate throwing money at things, but if the government is going to put up money and invest, AI is a great thing to invest in. With self-driving vehicles, the Internet of Things and robotics, to name a few, we know this is the future. We know where we’re going, although there will be surprises and bumps along the way.

The benefits are huge – not only from a competitive point of view but also from a health point of view. We know that healthcare technologies can be totally changed by artificial intelligence. Our healthcare sector at CES is
“The goal for CEOs is to think about the strategic future of the company, and the biggest impact today is technology innovation.”

growing. The number of companies involved with healthcare at our show is growing dramatically because these companies are solving problems. You shouldn’t have to go to the doctor every time you need something. You could do remote monitoring. You could use predictive intelligence with AI to anticipate and treat health issues. There are so many different things you could do, so we have to make sure our policies give us headroom to innovate. That’s our job as an association and as a country.

What should CEOs do to embrace technology?

The way you embrace technology is you go to different events and see the innovations there. As great as technology is, you have to have face-to-face contact to talk about whether you can trust someone, to be surprised and delighted, to learn things and to stretch your mind. The role of a CEO is not to make sure the FedEx package gets out tomorrow. The goal for CEOs is to think about the strategic future of the company, and the biggest impact today is technology innovation. If you stay the same, you’re going to be left behind.

Let’s shift to the potential dark side of technology. From biometric theft, quantum computing database sabotage, privacy loss, cyber attacks, loss of human jobs and industries, machines creating their own languages to bypass humans, what’s your take?

My take is technology is neutral. If you look at the major advancements in mankind, whether it’s the wheel, fire, the printing press, the car, the television or the computer itself – all of these innovations raise the human condition dramatically. Each one has been used as an instrument of war, so we’re always going to face this. But we’re living longer than we used to live, and we’re living healthier, better lives. We’re more educated. We’re more sophisticated.

The trick of government is to say, “Let’s have an intelligent discussion.” These things are good, these are going to improve the human condition. They are going to empower people with disabilities. They’re going to empower seniors. We have a generation of older people that can’t take care of themselves and we do not have people to take care of them. Technology is going to make a difference in people’s lives in a million different ways, including helping to solve the issues of starvation and clean water, among others.

How do we get the benefits of technology and acknowledge and address some of the risk factors as narrowly
as possible to limit the specific harm without choking innovation? We can’t afford to choke innovation. The strength of the U.S. as a country is that we have allowed our companies to develop without the government saying, “Do it this way” or “Do it that way.” Every step of the way, whether it’s the invention of credit cards, the VCR or something else, the government has said, “We’re going to let it take its course.” That’s why we’re leading the world in the number of unicorns, the number of great companies such as Airbnb, Amazon, eBay and Uber. I could go on for a very long time talking about the world-leading companies, many of which are members of CTA.

The reason the U.S. has world-leading companies is because we have a spirit of innovation, we have diversity and we have the First Amendment. We also have a willingness to bring together all these diverse people from around the world who want to become Americans and say, “We want to make it better.” That’s what we do in this country. There are plenty of things that could happen, but the worst thing a government can do is to choke innovation.

A government can also do positive things. They could say, “How do we educate our kids? How do we train them? How do we inspire everyone to go into these areas and get these great jobs? How do we change the nature of what we’re training for?” In the U.S. today, we have countless jobs open for data scientists that are going unfilled. There are so many new jobs that are being created. For instance, self-driving vehicles – we know they’re coming. Would that put drivers out of business? To a certain extent, yes. I know it will take a long time and there will always be a need for people in these positions, at least in the foreseeable future, but in the long run, jobs will be lost.

How do we retrain people, especially the rural population and older people, and get them meaningful positions? Those are the challenges we should be talking about, but we have to think about the long-term well-being of the country.

The long term is we want to keep our lead in innovation, we want to advance the human condition and we want to take these unique things that make our country great and continue to build on them. America must stick with our guiding principles – innovation, creativity, diversity, freedoms – and keep those as our strengths as we give people meaningful work. We must remove burdensome rules so companies can innovate and open doors to attract global talent. Then we have to have the discussion for the long-term future: Will everyone be working full-time or will there be other opportunities to do things? These are big discussions and they’re going to take years, but don’t choke off innovation and let the Chinese get ahead of us.

You see more transformative CEOs than almost anyone does and they’re all leading innovation. What are the characteristics of a great transformative CEO?

First of all, a great, transformative CEO listens. When you come in and take a job, if you have strong opinions right away, you will not succeed. You have to have strong listening skills. You have to be ethical, because you are a role model. You need to speak up when you see some wrongdoings on behalf of your company, and this is becoming more common now because employees want to feel they’re working in a good place, and customers want to feel their values are aligned with the company’s brand. CEOs have to be willing to go outside of their comfort zone, go to conferences and trade shows which are out of their expertise areas, to learn from other in-

“America must stick with our guiding principles – innovation, creativity, diversity, freedoms and keep those as our strengths as we give people meaningful work. We must remove burdensome rules so companies can innovate and open doors to attract global talent.”
“CEOs have to be willing to go outside of their comfort zone, go to conferences and trade show which are out of their expertise areas, to learn from other industries and to learn new concepts. Cross-pollination is the definition of creativity.”

dustries and to learn new concepts. Cross-pollination is the definition of creativity.

It’s not the case any longer where you move up in one segment of a company and you switch positions within that segment. You have to grow in a company. MBA programs are valuable for this in that they teach you how to work with teams – they teach you how to work with diverse teams – in a global way. The more you go around the world and not only listen to your customers, but also listen to others and get ideas, the better. It’s not a great CEO that says, “I think this way and I am always right.” The great CEO always listens to other people’s ideas and adopts the best ideas so that anyone in the company – or even a customer or a partner – could put forth an idea and you engage all those people. You will end up getting some great ideas.

The other thing, which is more difficult and that people don’t talk about, is you have to be willing to stop something and to fail fast. The problem with the biggest companies is, number one, they always have a cash cow they protect – and new ideas not related to the cash cow get much less attention. The other thing is that when they get a new idea, sometimes they spend money on it that they shouldn’t be spending. Compare that to startups, which can navigate this better because they have very little money and they fail fast.

Big company CEOs should talk to and learn from startups. That’s why at CES we have over 1,000 startups in an area called Eureka Park and, more and more, we’re seeing great CEOs walking around that area to see what’s out there, to get inspired and to get ideas. Just five years
ago, those startups were too small and they would never get the interest of a big company. But a big company doesn’t have to buy them or even invest in them; they could just partner with them, they can mentor them, they can get them their first customer, and that’s where a lot of the innovation is coming with startups because they often do it better than the big companies.

**Let’s go into the future. What will 2050 look like?**

We will have self-driving cars. We will have robots that are more and more human-like that will do a lot of tasks and even take care of us. We will have artificial intelligence that will be predictive in terms of our health. For example, you’ll sit in a chair and the chair will tell you whether you’re likely to get sick, and what you could do about it immediately to avoid getting sick. We’ll have specific genetic coding and treatments that will get rid of most cancers. We’ll have focused ultrasound therapy that can cure various types of diseases on an outpatient basis – including some forms of cancer. You won’t have to do chemotherapy and you won’t have to go through radiation. There are all these other things that are developing very quickly right now, they’re just not getting a lot of publicity. The future is really bright and we’ll be focusing on how we develop and what inspires us as human beings so we can, as the Gates Foundation says, develop our full potential.

**Any final advice to CEOs?**

You have to be willing to take risks. And sometimes you fail, and that’s not only you as a CEO, but that’s also people in your company, and that’s really important. Failure is the great teacher – not success. You think you’re successful, I think I’m successful, and I have to say I’m not that smart, I’m pretty lucky, but I’ve also taken a lot of risks and most of them have paid off. When they haven’t paid off, I’ve had great mentors and board members who said, “Gary, we’re still behind you. You took a risk, it didn’t work, you are honest about it, you cut it off quickly and you moved forward.” What I love about my own board is we can make a decision in 48 hours on something totally new because they are opportunistic, they’re flexible, they’re not slow and they understand that speed, flexibility and thinking outside of the box matter.
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AUGMENTED REALITY EXPERIENCE

CHECK OUT THE NEW PTC HEADQUARTERS IN BOSTON’S SEAPORT DISTRICT.

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step 1:
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It’s the tightest labor market in decades. As a result, HR is now under the microscope to transform talent into a true competitive differentiator. One way we think that’s going to happen is through blockchain technology.

Blockchain’s appeal is a clear way for permissioned parties to confirm, validate and authenticate the exchange of data through its distributed ledger. Blockchain encrypts data and validates transactions through consensus, distributing an immutable copy of exchanges to each entity that has a copy of the ledger. This builds a new level of shared trust between parties and removes the need for third-party verification.

With innovations like the recently-announced Sovrin Identity Network, individuals could soon have full control over their personal data, preventing misrepresentation and misunderstandings. (Sovrin is a centralized identity system that offers a lifetime portable identity for any person, organization, or thing.) Meanwhile, organizations would have access to a candidate’s education, employment and training history that’s accurate and virtually impossible to falsify.

These characteristics will be indispensable to HR practices like recruitment, payroll and employee data; let’s look a little more closely at each of those HR use cases.

**Transparency in Recruitment**
Keeping up with nuances in individual experience pro-
files is a challenge that’s accelerating in the growing “Gig Economy.” In highly-skilled roles like IT, job listings often list required experience in over 20 technologies, which can’t all be validated in an interview or test. Using blockchain, every employee experience could be captured and preserved for anyone who chooses to view it, delivering the “ultimate resume” with every aspect of an individual’s experience accounted for.

**Simplifying Payroll**

Paying employees, especially internationally, poses challenges. International payroll processes are slow and can require strict compliance to anti-money laundering laws like Know Your Customer. But blockchain’s immutability makes it easier to send money and meet compliance requirements. Blockchain can also automate routine data processes like calculating VAT, while enhancing fraud prevention and cybersecurity.

**Lowering Contingent Labor Costs**

Many companies require contingent labor to perform tasks like procurement services. Whether these companies work with suppliers to fill these roles or do the hiring themselves, blockchain can streamline contingent labor processes. This can increase opportunities in the global staffing market while potentially eliminating technical service invoices and invoice reconciliation tasks.

**Overcoming Barriers to Blockchain**

Major IBM clients are already experimenting and building out blockchain for talent acquisition and support efforts or have plans to do so in the next 18 to 24 months. And while it’s exciting to talk about what blockchain can one day bring to HR, challenges remain.

One is getting all stakeholders to agree on how a blockchain community would be designed and run. Some are beginning with a small, permissioned blockchain, limited to certain participants to increase trust versus a public blockchain viewable by all.

Another crucial aspect to address is data privacy. What if a potential candidate wants to access a blockchain where companies are searching — but that candidate’s current employer is also a member? These and other considerations need to be taken into account for blockchain to reach its long-term HR potential.

**The Time to Start is Now**

There are risks in the early adoption of any technology. But the risks of not investigating blockchain — and not investing in it — could be even more dangerous. Our advice is to start the discovery journey now or struggle to play catch up later. Competitive advantages will come from turning prototypes into mature proofs of concept, active solutions and networks. Valuable lessons from use cases and active networks in insurance, payments, capital markets and others can already be put to work in the HR arena. It’s a clear case of “lead, follow — or get out of the way.”

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**Elizebeth Varghese, IBM Partner & General Manager Talent & Engagement**

Elizebeth leads HR & Talent related consulting and outsourcing services in North America. She has worked for over twenty years in HR optimization, talent strategy, and organization effectiveness. Elizebeth holds MBAs from Columbia Business School, the London Business School, and a Masters from the Tata Institute of Social Sciences, Mumbai.
“For us, it’s a big vision. We believe that we’re creating the industrial internet. We are about enabling industrial firms to connect their machines and drive outcomes in those machines they never could before and help them to become digital.”

Robert Reiss: Talk about the GE brand and what it stands for today.

William Ruh: At GE, we’re in the business of digitally transforming industries to yield meaningful outcomes in complex environments - enabling industrial businesses to operate faster, smarter and more efficiently. Our brand is evolving as we transform industry by connecting machines to data and to people, developing entirely new ways to power the world, heal the sick, and move people and goods safely and efficiently.

What are the core industries GE is working with and specifically how is it helping them?

GE builds and sells the Predix portfolio to customers that our verticals serve across the energy, aviation, healthcare, manufacturing and rail industries to help them run their operations more efficiently. Take the New York Power Authority (NYPA) for example, the largest state public utility in the United States. Leveraging GE Digital’s software, data analytics and applications, NYPA’s new digital “mis-
“If you master your asset, there’s a natural extension to the operations and once you’ve done that, there’s a natural extension into your business innovation. That’s how you bootstrap yourself into becoming an Amazon of your own industry.”

William Ruh CEO GE Digital

Integration control” center allow engineers to process gigabytes of data and mine it for valuable insights. It also enables them to control all 16 of NYPA’s power plants as well as key points within its massive power transmission network, which supplies a quarter of the state’s electricity, including power for New York’s airports and subways. By leveraging Predix, NYPA is turning data into actionable insights to provide affordable, reliable and sustainable power.

How will digital transform business?

All of industry is going to have to master digital to compete in the future. Industrials need to leverage digital technologies to improve efficiency and move beyond autonomous systems. We are changing the relationship between humans and machines—moving to a world where machines advise people on how to be more efficient and productive. We do it by understanding and mastering assets—the foundational capability needed to transform digitally. By connecting machines and making them smarter, industrial companies can become more efficient and productive.

What are the first steps an enterprise CEO should take to incorporate this digital future into their strategy?

Let me start with a mistake I made in the beginning that we have really tried to correct. It’s very hard for a big company to get started here. The mistake I made is trying to be too separate from the existing business. In other words, you must engage your whole company in wanting to embrace change; you must bring along the whole company.

A lot of what you may read is, “Create a separate business, keep it off to the side because your bureaucracy will kill it.” The problem is you need to actually embrace it inside your bureaucracy and change your bureaucracy to embrace digital. There cannot be a two-tiered system where you have digital people and non-digital people because you have to take advantage of your domain knowledge, of your domain data. One problem is that those people are dealing with a quarter-to-quarter mentality in a successful business that they have had. What you have to do is figure out how do you do this so you bring along these people and turn them into digital migrants as well as bring in talent that are digital natives. You make this work and your culture changes, your talent shifts and your leadership embraces this because if you don’t start at the beginning of getting both sides of the equation working together, you won’t take advantage of your biggest asset being your scale, your brand, the unique things you have in your domain knowledge. That’s where big companies fail as they try to keep these things separate. We see this in retailers. They keep it separate and they are never able to become an effective digital retail business. They get Amazoned.

How do you grow a culture that integrates technology people and non-technology people?

It starts at the top. Our CEO, John Flannery, has always made sure we have digital meetings where all his direct reports and all the business leaders go through our digital strategy. There’s a lot of candor and openness about it where you have the CEOs of businesses trying to drive digital into their business. At the same time, we’re trying to push them to think outside of the box and look at some of these new technologies. The idea that you embrace this work across the organization is incredibly important.

Let’s go to one word, “asset”, which you’ve told me is a concept that is not being used enough by CEOs.

If you think about the consumer, let’s see what we can learn from them. Think about Uber, think about Apple, think about Amazon. What these companies have done is they take assets, usually from somebody else, and they build a digital experience around that asset which makes it fundamentally much more efficient and much more interesting with a new business model. Every company has the ability to do that. The question then becomes, and what CEOs should be afraid of is, what if someone takes
“With AI, the thing to be afraid of is not “the Terminator” view of the world. The thing to be afraid of is that somebody else delivers a better experience using AI and machine learning around your products and services than you do.”

your assets and figures out how to make it more efficient? That’s a significant competitive threat. The first place for CEOs to start is with your assets, your own products and services, and make sure you’re thinking about the digital experience.

By the way, you win. If you do that, you can drive your own productivity, increase your bottom line, and deliver a better product for your customer. Once you’ve mastered your asset, the digital experience around those assets, then you can move into your operations. Think about the grid. You’ve mastered all the components on the grid and made them more efficient, but now you move into making the grid more operationally efficient. How do I bring renewables on it? How do I bring the consumer into this? Then over time, you’ll move into business innovation. You will build new business models, you will deliver your product in a different way. If you master your asset, there’s a natural extension to the operations and once you’ve done that, there’s a natural extension into your business innovation.

That’s how you bootstrap yourself into becoming an Amazon of your own industry.

**How will digital change the customer experience over the next few years?**

It could go back to you wanting to make everything mobile, easily accessible and actionable. That’s what Uber has done in the taxi business and so you’re trying to create a digital experience around an asset. We think of a digital experience around the jet aircraft engines we sell. Our aviation business is a master of being able to take that data and deliver a better experience for our customers around it. The ability to connect to that asset, collect data from the asset and give your customers insight into how they’re operating is a win for everyone. That really does require you to have digital expertise, that you’re thinking about the experience in new and different ways and you have to have the talent. The one thing I would say for CEOs, you have to bring in the right talent to be able to complement the existing talent to build these new kinds of capabilities.

**Let’s talk about AI, machine learning. Should people be afraid of that or not?**

There’s a lot on this topic. We’re a long way and it’s not in our lifetime when we’ll have the kinds of AI and machine learning technologies where it takes over the world. With...
AI, the thing to be afraid of is not “the Terminator” view of the world. The thing to be afraid of is that somebody else delivers a better experience using AI and machine learning around your products and services than you do. That’s really it. What AI and machine learning can do is to be able to work faster and better at understanding a context of, “How do wind turbines work and how can we make them more efficient?” or “How does the grid work and make it more efficient using AI and machine learning?”

The real challenge for any CEO is going to be having these experts come work for you. I’ve seen studies that say there are maybe 1,500 real, true AI machine learning experts and they’re not going to come work for you because they have so many choices of jobs and pay packages. Unless you’re willing to create an environment where they are able to thrive, why would they come join you? As the CEO, you have to think this through, which means that you probably need to think about partnering as much as hiring these capabilities. You want to know more about your assets than anybody else. It would be a shame if somebody else uses AI and machine learning before you, because they will have a leg up to building the kinds of capabilities that you really want.

It sounds like a lot of opportunities for people who understand their assets and who know how to partner.

Absolutely! The one thing you can learn from Silicon Valley is creating your own ecosystem. You can’t do everything yourself. You have to figure out whose technologies will you use to go faster and then who are you going to enable to use your technologies to go faster because you have customers. When you sell to your customers, they aren’t thinking, “I don’t want to be digital.” They’re thinking they want to be digital. The more you enable them to be digital, the better off you’re going to be in your own world. You’re not just doing it for yourself, you are doing it for your customers and that’s how you really win. Create the ecosystem, think of it as open and make sure you make the right decisions about who you partner with and how you enable your customers to view you as a partner.

Let’s switch gears to your leadership philosophy. You’re managing about 26,000 technology-minded people. Do you have any unique leadership practices to help you recruit the best talent in the digital world and to help build those people and retain them?

What’s interesting that I’ve found and that has worked for us, and I think it can work for everyone is, technical people are really not just about stock options and things like that. The best technical people are actually driven by the mission. So the question becomes, “Can you talk to them about the fact that you’re going to change the world you operate in?” For us, it’s a big vision. We believe that we’re
“Digital twin technology is being talked about all over now and it’s going to be one of the most interesting things that changes the industrial world.”

Creating the industrial internet. We are about enabling industrial firms to connect their machines and drive outcomes in those machines they never could before and help them to become digital. People get into that, “Oh, I’m going to make healthcare better. I’m going to make the power generation better.”

You’re saying those companies need to have a very deep mission, a deep purpose?

Digital mission, yes.

A digital mission because otherwise people are not going to want to stay. They’re more driven by being part of history.

The second thing is they’re driven by the technology. The reason people stay is they look around and say, “We have the best data in the world.” They’re driven by the fact they have access to real data that they can make and use with their technology. We love the idea that people can do things they couldn’t do before with a mission and that’s what we’re trying to achieve.

What do you think the most exciting technology that came over the last year was and what do you think the most exciting technology will be within the next five years?

Certainly, we view machine learning as being important, but we’ve turned that into something we call a digital twin. The idea is that I have a machine, a physical machine, and a digital twin that is running all the time and is helping you figure out how to optimize the physical one. Digital twin technology is being talked about all over now and it’s going to be one of the most interesting things that changes the industrial world. When I look at the future, we really haven’t begun to explore how a blockchain can work in an industrial setting. The financial world is looking at it, but the reality is, machines can use blockchain with people to be able to manage our processes and ways
“Blockchain is going to be one of those technologies in the industrial world that may be more important than it is in the financial world.”

that we haven’t even thought of. Blockchain is going to be one of those technologies in the industrial world that may be more important than it is in the financial world. How do you like that?

How would you summarize the steps CEOs need to take to succeed in our digital world?

First, CEOs should know their assets. Second, they must create the right ecosystem. Third, they must find the right partners.
“My perspective is everybody should own their own data and have an explicit understanding of what that data is being used for.”

Robert Reiss: Talk about the Application Economy, a concept you have been deeply involved with.

Mike Gregoire: Applications are the points of connection in technology...whether those connections are happening within a business, between a business and its customers, B2B, or even customer to customer. Applications are about how you get and stay close to your customers, and that is powered by software. Software is the heart of everything in business. That’s what we mean when we say that every successful company today is a software company.

We have long recognized this concept, and our products facilitate companies’ ability to plan, test, deliver and secure their applications as quickly as possible in order to keep pace with market changes and demands. This helps our customers get close to their customers, and to continually deliver excellent digital experiences.
When you look at this new economy, what is your take with where we are in terms of talent?

On a global basis, we’re simply not cultivating the talent we need to support a digital economy.

There are plenty of studies that show that we already have a significant technological skills gap, both domestically and abroad. And when you project into the future, the situation only looks more dire. That’s why it’s so important that companies and industry associations work to reverse this trend.

CA, like many other companies, invests significant financial and human resources in programs that introduce young people, from children as young as six or seven all the way through high school, to STEM (science, technology, engineering and math) opportunities and curricula. We must start shaping our young people’s mindsets to see a future in STEM as something that’s exciting and productive while also being rich in potential.

When considered from an economic perspective, people with STEM skills earn higher incomes while the people who don’t fall further behind very quickly. We need to have a much better private-public partnership in addressing this problem.

And this isn’t a U.S. problem, it’s not a U.K. problem, it’s not a France problem, it’s not a China problem…it’s a global problem. To the extent that we can leverage technology to help bridge this economic gap, it will be something that we all find enlightening.

How will advances in technology impact the workforce?

Technological innovation – driven by mobile, Cloud and collaboration technologies – has catalyzed a fundamental shift in our society. The fast-paced digital economy is reconstructing businesses, models and the marketplace. Work is changing and we need to change how we understand work.

There is a lot of talk about job displacement, because every single time we have brought new technology into the modern economies of the world, we’ve had job displacement. But guess what? It’s always a net positive in the end. Nearly half of U.S. economic growth during the past 50 years is due to technological innovation, but the supply of those workers is not growing fast enough to meet the demand.

The issue this time is how quickly it happens. Advances in technology are happening faster today than ever before, so we have to be very agile with how we respond. In the area of reskilling, for example, we cannot take time to do long-term studies, we need to be much more on our toes and prepared to shift, change and learn. We should try and fail quickly, and where we find things work, we need to add more resources and the required capital. We have to collaborate more and help people understand.

For example, when we take a look at people who have been displaced or are at risk of being displaced, the fact is that they have skills and they want to work and they’re looking for jobs with dignity. Businesses have a significant role to play in helping young people, especially those in underserved communities, prepare for this new economic reality. By creating opportunity for them, we can also create a new generation of innovators and leaders for our companies.

You’ve been involved with the World Economic Forum for several years. What is their take on the future of the workforce?

The WEF is about bringing together leaders from the private and public sectors to address the world’s most pressing issues, and the future of work is clearly one of them.

As technology becomes integrated across all industries, it’s clear that our workforce must evolve. The contract between workers and employers is changing and government policies and business practices must change.

“Advanced analytics – especially in security – are an inherent part of being able to detect anomalies and defend against cyberattacks.”
With such a large number of disenfranchised workers and open tech jobs globally, reskilling is the obvious solution. I chair the WEF’s IT Governors Steering Committee, and we’re tackling the future of work head on.

At WEF’s annual meeting in Davos this January, we announced a digital retraining initiative called SkillSET, which is a portal that brings together best-in-class online training assets from 11 leading tech companies and consultancies. The portal is a free resource for people who want to invest in themselves, expand their digital literacy and skills, and figure out how best to participate in the fourth industrial revolution. We’re excited for the launch of the platform later this year.

I’m also wondering about data and the challenges that emerge.

Data, and who owns it, dominates the headlines and the mindshare today. Facebook’s issues have put the topic front and center, but it may be a blessing in disguise because there is a great push for transparency now and a lot of discussion around the issue.

People are starting to understand that Facebook has the data on who you are, and Google has the data on what you want. They’re beginning to recognize that free apps aren’t free, and they’re becoming more discerning about what they’re willing to trade off, in terms of their privacy. My perspective is everybody should own their own data and have an explicit understanding of what that data is being used for.

But it’s more complex and becomes a competitive issue when you consider that different countries have different regulations governing data, and that technologies like artificial intelligence rely on access to data.

In the EU, GDPR legislation has put bright lines around how personal data can be used, for what reasons and for how long. It’s highly regulated and the consumer is in charge. However, in China, which has the biggest data set in the world, the government owns the data and there are no restrictions on how it is used. China has more data and probably more people in AI technology than any other country, and that can create a significant competitive advantage. In the US, there is a more sectoral approach to these issues.

The bottom line is that different approaches exist across
the world, given different cultural lenses through which people look at the issue of privacy and data protection. We need a very tight public-private partnership on this issue, because uninformed regulation or uninformed policy could really put western nations behind the innovation curve. But industry needs to step up and recognize that a general status quo around these issues is also not an option.

**What can CEOs do about cyberattacks?**

Cyber security has to be top of mind and top of the agenda for every CEO and Board of Directors. It requires and warrants significant time and diligence, because modes of attack and protection mechanisms are always evolving.

Advanced analytics – especially in security – are an inherent part of being able to detect anomalies and defend against cyberattacks. This drove CA to work with behavior analytics and data science starting years ago.

Behavioral analytics, machine learning and automation help identify not just who a user is, but is this user doing what we expect him to do. Detecting anomalies is key to managing access. By analyzing user behavior and comparing it with similar previous behavior, CA’s solutions help flag activities that pose a higher than normal risk of breach.

Let’s shift and talk about CA Technologies. For the past three years, you’ve been awarded Most Ethical Companies and Best Places to Work for Multicultural Women. Talk about your culture and how that impacts your customer promise.

First of all, you used all of the most important words and sometimes people overplay them, but they overplay them because they’re very meaningful. Culture matters. When we think about our company, the very first thing we look for when we’re hiring an employee is do they fit our culture? We’re not trying to be everything to everybody. We

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*Peddle for a Purpose at CA WORLD. Charity Bike ride.*
have a very specific culture. We’ve documented it, we measure it, and we reward it.

Secondly, it is all about customers and there is not a product we build that does not have customer validation. We measure our customers’ use of our products. We’ve increased our net promoter score, which we measure each and every quarter. We upped it six percentage points just last year. We’re approaching best in class, and we’re almost 12 points past the industry average.

If you really pay attention to customers, they will inform you of what their exact needs are, and if you’re paying close attention to customers’ needs, you’re going to build very good products that customers want.

How is CA Technologies different than other companies?

One of the things that we do at CA is we try to make it very easy for a customer to go from a business idea to an outcome. If you think about how you’re going to make that happen, it’s going to be with software.

We provide the project management, we provide the building of tools, we provide all of the orchestrations to figure out what platform that application should be run on, whether it be in the private cloud, a hybrid cloud or a mobile device. We have all of the security and instrumentation to make sure that when our customers’ offerings get opened by their customers, it’s seamless, it’s fast, it’s trusted and it’s an instantiation of your brand.

One of your leadership philosophies stemmed from your concept of “every moment matters.” Define what that means.

That was an articulation of the things that matter most to me from a value perspective, and I thought very deeply about these things. It evolved over the course of 12 to 15 years of my leadership experience, and I wanted to be very intentional.

Every leader has to have some sort of ability to get others to follow. If you overplay that, you’re going to come across as hierarchical and arrogant which can be very dangerous. On the other hand, if you’re not self-confident, people won’t follow you.

It is about achieving and maintaining balance. Leading cannot be at will; it is constant. And you win and lose people with simple acts. Every moment must be considered and honored. That’s one of the points that I live by every day.
Let’s shift from leadership to you personally. You are an avid cyclist and skier and you recently took up mountain climbing?

That was done on a bit of a lark with a great world-renowned rock climber, Jimmy Chin. We were talking about leadership and challenge, and in order for me to be authentic with him he asked me to come mountain climbing, which I’d never done before.

I thought it was going to be something quite simple for a photo op, but he actually had me go climb the face of a pretty steep mountain in Jackson Hole, with all of the gear. It was something I didn’t envision ever doing, but it was a great experience and it really walked me into his world and helped me understand a different version of fear.

Was there any specific lesson you learned about leadership from rock climbing?

It’s the concept of letting go and really trusting someone that’s an expert and being willing to absorb the lesson that they’re trying to teach you. If you’re with somebody you trust, you can really do things that you never thought you were able to do before.

As CEO of CA Technologies, what is your advice to CEOs in succeeding in the application economy?

The first part is really understanding your customers and what they want, and that’s going to lead you into the digital economy. Then you have to make the very difficult assessment about whether your team is equipped for the mission.

A lot of legacy business models don’t lend themselves as easily to the digital environment. You have to make a conscious choice to create the right balance of talent, bringing in some new people that really understand the digital environment while also investing in some of the people you already have who are valuable subject matter experts in your business.
Robert Reiss: Not everyone has heard of Guidepost Solutions, but the work you do is of serious importance.

Julie Myers Wood: We focus on compliance, investigations, and security and technology consulting. Essentialy, we work with companies that have problems with the government, help them conduct investigations, fix their compliance programs and make sure they have a sound security posture. In today’s environment with new risks all around, it’s very important for CEOs to focus on the growing regulatory requirements as well as their security footprint to deal with any type of day-to-day issue that can occur – from a compliance lapse in their due diligence process to a cyber breach. Our company is heavily involved in compliance and security consulting with a focus on helping companies and their employees think more strategically about mitigating risk.

What are some of the key focus areas in compliance?
We’re very involved, for example, in crypto currency and working with companies that are trying to use new technology such as Bitcoins, but at the same time trying to be compliant. For them, we will develop a new compliance program, one that will fit their unique business model. We’re able to be practical and creative and give them something that works and something that the regulators will be satisfied with.

Of course, we always get calls from companies after the regulators come knocking and in some instances, we have been called upon when the government has started to investigate a company or when the government has executed a search warrant on a company. These companies call us because of our professionals and their backgrounds as former FBI, CIA, and Homeland Security agents as well as former prosecutors. They want to know, “How can you help us fix this? How can you help us address these problems in a proactive manner?”

You have told me that preventative compliance focus is much better than the crisis mode because once there’s a problem, with social media today in just 20 minutes the whole world knows. It’s too late.

That’s absolutely right and the reputational risk of a government investigation, even if ultimately you pay a small fine, can be very significant. It’s much better to really build in a compliance culture as you’re growing your company and it’s important for CEOs to be thinking about that as they go about their business.

Let’s talk about the actual word “compliance.” Is it black and white or is it grey?

There are areas where it’s black and white; there are also areas where it’s grey and areas where professionals have to use their best judgment. One of the reasons to retain a firm like ours or to work with counsel on compliance upfront is because a lot of issues haven’t been decided concretely by rules, but when regulators suspect a problem or when they come in, they’re going to have this 20/20 hindsight and they’re going to expect that you decided something in a certain way. When there are difficult problems or when there are nuanced problems, you want to have fulsome thinking based on the company’s risk appetite. This way, you can make a decision that you know will hold up or be defensible when a regulator walks in the door.

Is there an example of a challenge where one company handled it the right way and one handled it the wrong way?

Absolutely. As the former director of Immigration and Customs Enforcement, we get called upon often to help with immigration and customs issues, and I recall very clearly two examples that I’ve had specifically dealing with CEOs. In one instance, the government executed the warrant on the company’s facilities, made a number of arrests and the CEO called me in to meet with him, hired our firm to look at what they could do differently and really thought about building a strong compliance structure. In that instance, the CEO went in with his lawyers and made a great case to the government. They were able to negotiate a very successful resolution. In the other case, the government did the exact same thing, came in with the search warrant, made a number of arrests, but that CEO’s first instinct was to fight, thinking the only way to succeed was simply to push back at the government. He said he didn’t like the laws and he didn’t want to do anything with the laws. He wanted to go to the White House. That case dragged on for a very long time. Ultimately, the resolution was not as satisfactory and the reputational damage to that company was significant.

Reputationally, in our digital world, the problem could be on social media for four months or more.

It could be four years, not just four months. Some of these federal investigations go on forever in many areas.
“If potential executives know that you publicly reported your company is under an FCPA investigation or under an investigation for sanctions violations, they think, ‘I don’t want to go there. I want to go to a company that doesn’t have those kinds of problems.’”

Specifically, how does that impact the company reputationally?

Reputationally, it can be a real hit. Think for example of trying to recruit the best of the best, and we all know that the war for talent is real and it’s difficult to get truly talented people to come to your companies. If potential executives know that you publicly reported your company is under an FCPA investigation or under an investigation for sanctions violations, they think, “I don’t want to go there. I want to go to a company that doesn’t have those kinds of problems.” As a CEO thinking about these issues upfront and trying to prevent them is more beneficial than sensing that there’s something wrong and aggressively managing it. It’s so important to really try to protect the company’s overall interest.

It impacts talent. I would venture to say you may lose existing clients and potential clients would be less likely, not to mention clear strategic thinking and focus on growth from the board. It impacts everything.

That’s absolutely right. It impacts everything and it’s difficult for your top talent to remain focused if they’re under a threat of investigation that drags on for years and years, so thinking about it proactively, making sure that everyone knows proactively that you’re addressing these things, is great. When you think about some of the recent big settlements that involved Tenet or Volkswagen, the U.S. government talked a lot about culture and how culture comes from top leadership. Companies have human beings. Human beings make errors. And, sometimes you have people that engage in bad actions. You as a CEO, though, can really help shape the company and help change the culture towards a more compliant and ethical culture even when things go wrong.

What else as our world is moving completely digital, do you handle that’s in that world?

We provide consulting and security design on all kinds of technologies from making recommendations for positioning security cameras to implementing turnstiles and access controls. Whatever it may be, we have security experts and engineers to help design the safety and security elements of buildings. We conduct tabletop training exercises for crisis management and help companies develop security operation centers so they have a global picture of all the threats both physical and cyber.

For example, whether you’re building a plant overseas in Thailand or in the United States, you want to figure out what the security posture of the building should be. Where do you want to position your cameras? Where do you want to post security guards? What kinds of cameras should you use? What types of door locks should you consider? What sort of threat and incident information should you be aware of? Do you need a global security operations center? Those are the types of questions we help companies all around the world answer. If you as a CEO haven’t thought about these things, you should think about them now because you can’t push these security issues down as new threats come your way. If you have an active shooter or some other breach at your facility, the shareholders and others are going to be coming to you with the expectations that you took the appropriate actions to protect your people, first and foremost, and to protect your product.

Prior to Guidepost Solutions, you were a leader in Homeland Security.

I was very fortunate to have a great career in government and my last role was as the Director of Immigration and Customs Enforcement (ICE) at the Department of Homeland Security. In that role I led an agency of more than 17,000 men and women. It’s the largest investigative agency in the Department and the second largest in the United States, second only to the FBI. We managed all the federal guard services and we also conducted all customs and immigration enforcement efforts.

What did you learn from that situation about the problems that occur and how to handle them?
When working at ICE, I recall sitting across from CEOs when we were targeting a company for prosecution and seeing how the C-Suite handled problems.

You knew the other side of what it was like?

Yes, I did.

You knew how they were thinking and what you’re going through?

I did and sometimes when a company would come in to try to negotiate a settlement, I would be there with the prosecution. The CEO would almost give a sort of blank stare when we asked what they had done.

What are you thinking when you’re on the Homeland Security’s side and you’re seeing the CEO there. What’s going through your mind when you were in that role?

I am thinking, “I hope they have a good story because I’m seeing some real problems…”

You really hope they have a good story or you want to just prosecute them?

Well, I’m a prosecutor by trade. I was a prosecutor before being at ICE, so I do love good criminal cases, but I also don’t want to see companies fail. I was at the criminal division during the time of Arthur Anderson. I saw a lot of things that really negatively affected companies. When I was sitting across from these CEOs, I could understand what we saw as a part of the prosecution and I wanted to hear what they had done, their side of the story, because there is always more. What frustrated me when I was at Homeland Security, and that’s frankly why I got in to the role of compliance, is that often the CEOs could not fully explain the steps they had taken.

When I left ICE, I started my own firm, before Guidepost Solutions bought me out, to create software tools and provide compliance assistance to businesses, so that they can avoid being on the wrong side of the table.

“What frustrated me when I was at Homeland Security, and that’s frankly why I got in to the role of compliance, is that often the CEOs could not fully explain the steps they had taken.”

You were originally a software company?

We were a software company. I loved designing tools. Now, Guidepost Solutions is helping companies look at tools and evaluate them. We have a lot of folks with technology backgrounds and are good with automation and can think creatively about what’s out there in the market and how can it be used most effectively or, frankly, what are the tools that don’t work.

Is everything completely real time now?

That’s absolutely correct, and that is something that I see at Guidepost Solutions – everything is real time and if you are not constantly updating and innovating, you’re going to be left behind. As the CEO, if you haven’t looked at your compliance tools and your software in a while, it’s probably time for a refresh. Are those still serving you? Are the algorithms set in a way that the regulators would expect? I can tell you that often, they aren’t.

Especially with technology moving so quickly, that’s why they’re going to become outdated just like Google Algorithms.

That’s right, so you must constantly be thinking to stay one step ahead.

How often should a company check on its compliance and on its software?

A company should be doing continuous monitoring of the services of its software platforms and other services, but we recommend every year or every couple of years to do a full assessment on the technology piece.

What is the one question a CEO should be asking their team?
“The one question the CEO should be asking their team, certainly with respect to technology, is what level of confidence do they have that the algorithms have been set and are effectively addressing the risk.”

The one question the CEO should be asking their team, certainly with respect to technology, is what level of confidence do they have that the algorithms have been set and are effectively addressing the risk.

I have a personal goal of America having 50 of the Fortune 500 to be women, and we’re unfortunately far behind that. Do you have any insights on being a woman leader?

Certainly, there were challenges being the first woman head of ICE, as it was constituted at DHS during my confirmation courtesy meetings.

You were young as well. How old were you then?

I was young and I looked young. I was in my 30s, but I looked very young, which I suppose was a blessing, but at the time it felt a little bit like a curse. I had to go up to the Hill and around the Hill to meet with all the senators, and this was right after Katrina. I actually had been working in the White House helping the President pick cabinet and sub-cabinet positions, but my real expertise was law enforcement. I’ve been a prosecutor; I’ve run a small law enforcement agency at Commerce and so I wanted to head up ICE. Frankly, the reason I wanted that position was because the new DHS Secretary, Michael Chertoff, had been a mentor to me and I was his chief of staff at the criminal division at the Department of Justice. I had all these reasons why it was a good fit, but coming after Katrina, there was a lot of criticism, with the thought being that it should be someone older, more mature, in this position. Some of the senators were a little taken aback that I was a woman. I recall one example during the Hill courtesy meetings where a senator actually asked me what my husband thought of me taking the job.

We all were all taken aback, but of course I was trying to win the senator’s vote, so I said, “He is very pleased and very proud of me.” Little did that senator know that not only was I married, but I would also shortly be pregnant during my time at ICE. I tried to, obviously, hide my pregnancy as long as possible, but there were a lot of challenges coming into ICE as a younger woman, and what a great, fabulous experience. There are great men and women at that agency, and what an honor to serve in that law enforcement mission.

What advice do you have to women to succeed in business, become CEOs and be successful CEOs?

My biggest piece of advice is to raise your hand. Every job that I’ve ever gotten has been a big job. I’ve raised my hand for it and it’s been hard to do, at times even scary to do, but I’ve made the effort. When I was in presidential personnel working at the White House, I saw a big difference between what the men said and what the women said when they interviewed with me. I recall an example when I had two candidates for the Department of Defense positions. Both had basically equal, identical...
resumes. The man said he wanted to be deputy secretary. The woman said she wanted to be special assistant to the deputy.

**Right there tells it all. Herein lies the problem.**

Right there, and so you know if you’re a woman and you think there is a big job, raise your hand, seek mentors. Seek those who can give you counsel on how to do it and you can do it. With respect to your goal of 50 women CEOs in Fortune 500, I’d like to see more than 50. I want to see 75 female CEOs at the Fortune 500 and Guidepost Solutions could help them all!

**Finally, for CEOs, what is one sentence on the first thing they should do to know that they have no compliance issues?**

Hire great people into the role of Chief Compliance Officer and Chief Security Officer and pay them sufficiently.

**Great having you on The CEO Show, Julie.**

Thank so much for having me.
Describe how the world will change within the next two decades.

Imagine a future in which we are able to live healthy, productive lives though jobs no longer exist. We have comfortable homes, in which we can “print” all of the food we need as well as our electronics and household amenities. When we need to go anywhere, we click on a phone application, and a driverless car shows up to take us to our destination. I am talking about an era of almost unlimited energy, food, education, and health care in which we have all of the material things we need. This is what technology is enabling. Powered by advances in computing, with the capabilities doubling, prices falling, and footprint shrinking every year or two, practically every field of science and technology is now advancing on an exponential curve. It is making amazing and scary things possible.

Technology is literally taking over everything: every part of our lives, every part of society, every waking moment of every day. Increasingly pervasive data networks and connected devices are enabling rapid communication and processing of information, ushering in unprecedented shifts – in everything from biology, energy and media to politics, food and transportation – that are redefining our future. The shifts and the resulting massive ripple effects will, if we choose to let them, change the way we live, how long we live, and the very nature of being human.

What are the most significant challenges that will emerge and what decisions do we need to make now?

Broadly speaking, we will need to choose one of two possible futures. The first is a utopian Star Trek future in which our wants and needs are met, in which we focus our lives on the attainment of knowledge and betterment of humankind. The other is a Mad Max dystopia: a frightening and alienating future, in which civilization destroys itself.

These are both worlds of science fiction created by Hollywood, but either could come true. We are already capable of creating a world of tricorders, replicators, remarkable transportation technologies, general wellness, and an abundance of food, water, and energy. On the other hand, we are capable too now of ushering in a jobless economy, the end of all privacy, invasive medical-record keeping, eugenics, and an ever worsening spiral of economic inequality: conditions that could create an unstable, Orwellian, or violent future that might undermine the very technology-driven progress that we so eagerly anticipate.

What impact will autonomous cars have?

In addition to making our lives easier by doing the grunt work of driving, their adoption will slash accident and fatality rates, saving millions of lives. As well, it will remove one-third to one-half of all vehicles from city
streets. A large percentage of the cars on the streets of New York, San Francisco, and Mumbai at any one time are looking for parking; but self-driving cars don’t need to park: they can continuously circulate, picking up and dropping off passengers. Fewer shared vehicles will be necessary to provide the same service collectively that personally-owned vehicles provide. During peak hours, those shared vehicles will be in use 90 percent of the time. And, with no more need for steering wheels and other systems enabling human control, vehicles will be lighter and far more fuel efficient. Most important, car sharing will cost a fraction of what car ownership today costs. Owning a car for daily, personal transportation will seem impractical.

And then, with self-driving cars, the disabled will no longer struggle to find transportation; they will have an on-demand personal driver. Women and children will never worry about getting a cab ride late at night. Teens will not face insurance discrimination as they do today, and their parents will not have to pay for the dubious privilege of teaching a teenager to drive. People living in the country will finally gain access to transportation services that put them nearly on par with their city cousins. Pedestrians will stop worrying about getting hit by cars in intersections.

And eventually, human drivers will be kicked off the roads – just as the horses were by the horseless carriages!

How will the digital world change healthcare?

Already we are wearing medical devices that monitor our activity, heart rate and other vitals. Soon, we will have tags embedded in our clothing that upload data to our smartphones so that AI doctors can analyze these. And we will have sensors within our body looking for signs of problems. With the breakthroughs in genomic sequencing, we have already become data; it has become possible to study the correlations between our health, lifestyle, and disease and gain a better understanding of how we can optimize our health. In addition, the sequencing of the bacteria in our guts is revealing new secrets about the organisms that may actually be regulating our health.

Watch for amazing breakthroughs over the next decade which transform the entire field of medicine.

What should CEOs do to help build a better future?

CEOs need to understand that whether they are ready or not, major technology changes are happening. A wide range of technologies are advancing at exponential rates and are converging in ways that enable them to wipe out entire industries in favor of new ones. This is the new nature of disruption, in which the competition comes out of nowhere and business models change. The incumbents in every country are not ready for this; as a result, the vast majority will become “toast.” And it will occur within the next decade.

They need to change their way of thinking about competition – and ways of innovating – if their companies are to survive. Innovation has globalized; business models and technology developed in one country can easily be exported to another. Companies will need to make bold changes in order to survive in this new era of industry disruption. They must take big risks and disrupt themselves – before someone else does.


Website: www.wadhwa.com, Twitter: @wadhwa
“We pioneered the idea that you should model things in 3D because that’s the real representation of physical things.”

Robert Reiss: With so many technology companies, how has PTC created a different model?

Jim Heppelmann: We started the company 30 years ago around the idea of computer aided designs, 3D modelling, and the idea was to come up with the digital model of something that once the model was right, it would become a physical product. We have deep expertise in how you develop products digitally then manufacture them in the physical assets.

What we have done in the last five years is invested in how to take that physical thing, add sensors to it and connect it up to the internet. Then we are able to capture and analyze usage, performance, and environmental data, bring data from the physical product back into the digital world, and combine it with the DNA of the product that we’ve defined digitally in the first place.

We have some CAD or PLM competitors who might
"We have some CAD or PLM competitors who might compete with us on the digital to physical capabilities, and we might have some IoT or AR competitors who would compete with us on a physical to digital. But this combination of both, a closed loop between a digital twin for every physical thing where information flowing in both directions is really unique to PTC."

compete with us on the digital to physical capabilities, and we might have some IoT or AR competitors who would compete with us on a physical to digital. But this combination of both, a closed loop between a digital twin for every physical thing where information flowing in both directions is really unique to PTC.

You’re really replacing 2D with 3D.

Exactly. We pioneered the idea that you should model things in 3D because that’s the real representation of physical things. If you need to create 2D drawings for documentation purposes, that’s fine. But think of a submarine as a collection of 2D drawings, and you assemble that in your brain. It’s very difficult for an average human to be able to accurately construct the 3D model from 2D information. By making a 3D model, we can make sure all the parts fit together and all of the wires are routed in the right place. 3D is a very powerful medium to design in because you are sure that the design will be manufacturable when the time comes.

If you apply that same logic to how humans consume all other digital information, we uncover the value of Augmented Reality. Instead of delivering digital information to humans via 2D laptop and mobile phone screens, we can now deliver that digital information in context of the 3D physical environment. This enables humans to make better decisions faster.

Talk about the difference between virtual reality and augmented reality and how that fits in to your business.

We had to look at the word “reality” because in virtual reality, you’re substituting a fake world -- the reality has been virtualized or made artificial. In the case of augmented reality, you’re putting digital information on the real world. In one case you’re putting digital information in the real world, that’s augmenting reality; in the other case you’re throwing the real world away and creating a fantasy world, that’s virtual reality. These are both interesting techniques, for example if I want to show you how to change the oil in your car, I can overlay the oil change procedure on your actual car. However, before you do that, I may want to give you a training simulation, so I’ll simulate the whole car in virtual reality and show you how you would change the oil when there is no car. I simply simulate or virtualize the whole idea of a room with a car in it and your job is to go change your oil. From my research with Michael Porter, augmented reality is ultimately more powerful for businesses.

Describe your partnership with Michael Porter and Harvard Business Review to write a series of thought leadership articles.

First of all, I came to know Michael when he was a director on our board some years ago. He was on our board for quite a long time, but as I was becoming CEO, he was retiring. Michael Porter is a great strategic thinker and I like to think of myself as a technical visionary, which became the foundation for our partnership. Michael and I spent time talking about how technologies like the Internet of Things and augmented reality would be used by a company to further their competitive advantage. We quickly realized it’s a special combination -- I have feet on the ground, I understand the technology and I have thousands of customers while Michael, on the other hand, has unbelievable frameworks, and has a critical eye for what this really means for business strategy and competition. When you put the two of us together, you get a very interesting perspective that neither of us could have done independently, but together it’s pretty darn good work.

What really happens at the intersection of the internet of things and augmented reality?

This is the essence of the closed loop between physical and digital I referred to earlier. The internet of things

“Michael Porter is a great strategic thinker and I like to think of myself as a technical visionary, which became the foundation for our partnership.”
means we get data from these billions of physical things in the world. Where these are things that we don’t normally think of as computers, they might be automobiles or trucks, or garbage cans, or refrigerators, or cattle.

Even a bottle of milk.

Correct, even a bottle of milk. We can bring that information from the physical world into the digital world. Part of the problem is that while we have so much more digital information available to people, the ability of people to process this information actually hasn’t improved much. So how do we convey information more quickly to people? A good way to do it is to make it graphical but take off the 2D screen and put it in context of the 3D world.

Augmented reality is about taking this digital information and overlaying it onto your view of the physical world. Overlay a service instruction, overlay a manufacturing instruction, help you identify which thing to pick up from the warehouse and put it in your cart to fulfill an order, etc. It’s a powerful concept and it’s really about giving people the ability to process digital information far better than ever before. Augmented reality is putting your very best sense to work, which is your vision, to process the increasing deluge of digital information available to us.

What is an example of augmented reality creating business value in an industry, for instance automotive?

A good example is Ford Motor Company. They use augmented reality to augment a design change onto an existing automobile. For example, there is a physical automobile in front of you. You say, “I don’t like it. I don’t like the way this mirror works, it just doesn’t sing for me.” You then ask if a new mirror could be designed, which is then taken right off the computer screen and augmented onto this automobile, abstracting or occluding the one that’s there to show how the physical automobile would look with the new digital mirror. It’s a simple but a good example of an engineering design-use case using augmented reality to bring data off the screen into the physical world to improve the final design or the time it takes to bring this automobile to market.

From your example, I’m thinking augmented reality has many applications in the training world.

“Augmented reality is putting your very best sense to work, which is your vision, to process the increasing deluge of digital information available to us.”

Precisely, both in training and in operations. There are many cases either in the service, after-market service or in manufacturing where you have people that need complex instructions that they either have never done before or haven’t done for a while. They will need to be guided through the process either ahead of time for training or in the moment and then they will need the certainty that they did all the steps and did them in the right order. If we think of an automobile parked in front of us that has a problem, thanks to IoT, we know what the problem is. Thanks to augmented reality, I could show you how to fix it.

Let’s talk about another major industry, healthcare. It impacts everyone personally, and is about 17.8% of the GDP. How can IoT and augmented reality working together positively impact healthcare?

It’s one of the hottest fields for both of those technologies. Let’s break it down into two components — one being medical equipment and the other being people. On the equipment side, for example, we can monitor diagnostics machines. Let’s say I make a diagnostic machine. They’re implemented at clinics or hospitals all over the world. With IoT I can continuously monitor all this equipment to make certain it is up and running. I can anticipate if there’s going to be a problem and potentially intervene so the problem doesn’t happen. When equipment fails unexpectedly it can be a matter of life and death because there’s a line of patients who are supposed to be processed at that time and now are unable to be. Using IoT, I can monitor a fleet of diagnostics equipment to predict a failure and source the parts required to correct the issue, and then if I need to send a technician there, I can use augmented reality to show the technician what to do when he gets there and guide him through the repair process, minimizing equipment downtime and improving patient care.

Let’s switch gears to the people, the patient. There are some use cases here that are very interesting. Let’s take a patient who goes through a diagnostic machine like a
CAT or MRI scan. We now have a digital model of what’s inside that human, but when I look at the human, I can’t see it, I have to look at a computer screen and I see a representation on the computer screen of that patient. With augmented reality I can lift that data and overlay it with wearing smart glasses on the person. So when I look at the person, I see the CAT or MRI data in context and it’s all on exactly the right place. How powerful is that concept to help a doctor really get to the point.

I want to ask you quickly about smart glasses because when I spoke with Jay Walker, the founder of Priceline, who has more patents than almost anyone in America, he said the next big thing is smart glasses. In your HBR article on Augmented Reality, you talked a lot about the potential of smart glasses.

Yes. To date, the lack of affordable, lightweight, high-performance smart glasses has been a barrier to augmented reality’s widespread adoption. But the race to develop a popular version of this new digital interface is on and is attracting massive attention from both tech titans and upstart inventors. Investors are pouring money into these smart glasses because they are betting that augmented reality will ultimately disrupt the market for phones and tablets. Those screens that we carry in our pockets will be replaced by augmented interfaces that we wear.

Let’s take a detour from smart glasses for a minute and think of the adoption and use of hearing aids. A hearing aid takes the soundwaves coming to you. It does some digital pre-processing. It hides background noise, it amplifies foreground noise and it passes those modified soundwaves into your ear, and now you can hear things you otherwise couldn’t. So now let’s think about smart glasses. They have the same concept which is, we take light waves coming in, we intercept them, modify them to add digital information into them and pass the modified light wave into your eyeball. What you see now is a combination of the real world but with digital information added into it.

As an example, I put on a pair of smart glasses and I look at the patient actually wearing the CAT or MRI scan because I have augmented that digital information into my view of the patient using the smart glasses. It’s an amazing concept that’s going to revolutionize the world.”
cause I have augmented that digital information into my view of the patient using the smart glasses. It’s an amazing concept that’s going to revolutionize the world.

**How should CEOs think about augmented reality?**

Using some of the frameworks from my friend Michael Porter, competitive advantage really has two legs. The first one is in your offering: how distinctive and differentiated is your offering; and the second one is in your operations: how operationally efficient are you in what you do, in your engineering manufacturing service, finance ranks. AR and IoT affect both of them. First of all, we can build products that have capabilities that were not previously possible. On the offering side, you have an opportunity to do some amazing value creating, differentiating things with your products. Here is a great example: AccuVein is a medical device company that augments data onto the patients so you know where to do the vein stick and you won’t miss. Because it’s sensing the skin temperature, calculating where the veins are and augmenting the view right onto the patient’s arm, you draw a blood, never missing the vein because you know exactly where it is. In your operations, because we can supply information to people so much more efficiently, general human activities are above 30% more efficient. You get the job done faster with less manpower and it’s more accurate with fewer mistakes. These are tremendous operational efficiencies to complement what you could do with new products offerings. It’s a pretty profound impact on the competitiveness of most companies.

“What is the first step for a CEO to become involved in augmented reality?”

The first step is to get educated, which is outlined in the articles Professor Porter and I wrote. The next step is to play with the technology. We tried to lay it out at the level of HBR, which is a business level for executives, however
it’s important to play with the technology. Get a group together, ramp up some demonstration scenarios, it doesn’t cost much and it’s just eye-opening. The first time you put on a HoloLens and you realize, “I can see digital information when I look at physical things.” It’s hard to talk about this information because you need to experience it. So I say go build some demos, have your people generate concepts, come see us if you need to, we’d be happy to show you.

Let’s turn to leadership. When you became CEO in 2010, you came in and were asked to turn around the company. PTC has certainly achieved noteworthy results. Talk about your strategy.

The board charged me to fix the profitability and fix the growth rate. I have a technology background, so I saw some amazing new technologies that, in my mind, were adjacent to the technologies we already had. I said, “I think we can leverage our way into these adjacent markets.” A lot of people didn’t see it but I did. I was very compelled, passionate about it. A measure of a good leader is whether or not they have good followers. At PTC we have a lot of people who are super excited about what we are doing. I was a visionary, a cheerleader and a change agent to try to get people who didn’t want to change feel good about this particular change, and to encourage them to leave the inertia behind, come to work and do something different, to try to make a new company out of what we’ve started with.

If you could summarize your leadership philosophy, what would that be?

Make it real. Nobody gives more demonstrations of what’s possible in this company than me, and it’s because I want to show our employees, our customers, our partners that this is something that’s going to be amazing. And when you see it, you’re going to be surprised. You’re going to want to be a customer, be an employee and come work for us, or buy from us. I’m the passionate leader, demonstrating what’s possible and making people want to come along for the ride.

Jim, a pleasure having you on The CEO Forum.

Great! Thank you, Robert.
“What will the vehicle become?”
It will be a self-driving electric vehicle, powered by a tremendous amount of battery power, and we are the leader in the battery space in electric vehicles.”

Robert Reiss: What does the Panasonic brand mean to you?

Thomas Gebhardt: Panasonic is an iconic brand, and our company is celebrating our 100th anniversary this year. We’re also going through a significant transformation, especially in the last 10 years, from a consumer electronics company to the integrated business solutions and B2B company that we are today.

Panasonic has become a leader in autonomous and electric cars. In fact, prior to being CEO, you led Panasonic’s automotive division. What is the future for that division?

Everybody thinks of us as a consumer electronics company, but in North America, automotive is actually the largest segment of our total business. It is a growing industry as a whole so the question is, “What will the vehicle become?” It will be a self-driving electric vehicle, powered by a tremendous amount of battery power, and we are the leader in the battery space in electric vehicles.
When will electric vehicles become mainstream?

The number of electric vehicles is increasing year over year, so there’s no question they will be mainstream. We believe parity is going to exist between the internal combustion engine and the electric vehicle somewhere between 2022 and 2025. In that timeframe, they become the same from a cost and value standpoint. People will make a determination, “Do I want to drive electric or do I want to drive a combustion engine?” and it will no longer be choosing to pay a premium for one over the other. We believe that most people, if all the parameters are the same, will choose an electric vehicle for its performance as well as its environmental impact. The electric vehicle even offers an impact on performance in ways that are unique.

For example, when you balance an engine in the vehicle, there is very little flexibility. Whether it’s located in the front or the back, there is a large size and weight and you can’t really do much with it. In electric vehicles, there is a battery and much smaller motor, so you can reconfigure the vehicle in different ways to distribute the weight, which impacts its performance. People don’t talk too much about those advantages, but with the electric car, you’re going to get a clean drive in an environmentally-friendly car with characteristics that will enhance the performance in handling.

How about autonomous cars?

The ultimate customer for autonomous electric vehicles are the rideshare companies. Their two largest cost factors are the driver and the gasoline that powers their vehicles. If you take both of those costs away and take a look at the economic model, you’ve taken the two biggest cost parameters out. Now you have the convenience of rideshare, and you no longer have a personal vehicle that is idle 70% of the time. These great utilizations are tremendous opportunities for commercial trucking as well, with its shortage of truckers and limitations for how long truckers can be on the road. If you just look at it from a commercial standpoint, an autonomous vehicle can theoretically be on the road 24 hours a day. Approximately 90% of fatal accidents on the road today are caused by human error. Even if autonomous cars improved it by 50% (which we think is a very low number), you’ve reduced fatalities and increased safety significantly. You put all of that together and you’ve got a very compelling argument on why autonomous vehicles are going to happen. The technology is evolving and clearly, we think there’s a market need.

What about the cost and economics of autonomous cars?

For the autonomous vehicle today, application by application, it’s not practical enough. As a personal vehicle, the real problem isn’t the cost, it’s that you’re only utilizing it 20% to 30% of the time. If you extend that usage into commercial applications, such as rideshare applications, etc., the economics then become overwhelmingly positive. The economics are probably not overly practical until 2025 or even 2035, when people will say, “I need a personal vehicle that’s autonomous.”

When will autonomous cars become mainstream?

It’s hard to put a finger on exactly when it will become mainstream. By most estimates, it’s around 2030 when 10% to 20% of the cars produced each year will be autonomous, and it will accelerate from there. That number could go up because there are a lot of technology innovations that are moving at a rapid pace. Conservatively, 2030 is a likely timeframe. It’s also interesting to think that the next generation of children may not be driving a car, or may not even learn how to drive a car at all.

“With the electric car, you’re going to get a clean drive, you’re going to get an environmentally-friendly car with the characteristics that are actually going to be enhancing some of the performance in handling.”
How will the entertainment systems of the future cars be different than they are today?

One of the things we’re doing at Panasonic is we’re impacting the living space. Historically, we were well-known in your living room and your TV room as a TV entertainment company with audio expertise. What we believe as we move forward is that the venue is changing. It’s the same environment, but now the environment is in a moving car, or an airplane, or wherever it may be. Today, we provide entertainment solutions in airplanes, we provide systems in vehicles, and the systems will become more and more like ones for a living room or TV room.

Autonomous cars will become a moving living space. The commercial application, like for Uber or Lyft, is viable right off the bat with high utilizations. Eventually they will become practical for the personal and individual users, but that will come in a second wave – for people of premium vehicles and then mainstream consumers.

Name the different types of cars that there will be. You had once explained to me the concept of the ‘business car.’

Yes, there’s certainly going to be the business ridesharing vehicle. There’s also going to be last mile delivery vehicles. The logistics and small package delivery industry is accelerating and their need makes practical sense with electric vehicles. Even large logistic electric vehicles -- Tesla has introduced theirs, others have been announcing their freight vehicles as well. Commercial, lighter use vehicles and then eventually personal use ones.

Let’s now talk about the future of energy.

The whole idea of renewable energy, how it works, how it is stored, is going to become more relevant as the needs for electricity and power increase over time. There is wind and sun as power sources, but you have to have a mechanism to store the energy. You can create energy
from the sun through a solar panel, but you have to store it using massive batteries in order to use it on demand – during peak periods, or during different parts of the day.

**Will the energy model be B2B or B2C?**

Initially, it’s going to be B2B. It will be powering the grid that will regulate the energy and flow of the grid. Eventually, it can be a B2C play to power homes with storage systems. They are viable today and there are a lot of people doing it. What we will see is communities and cities being their own consumer of the energy, pushing it out there and regulating it.

**I’ve heard there is even a technology where you can almost spray on a roof for solar energy.**

Yes, there are a number of new ways to create energy. But the risk in just creating it is that you have to use it or you potentially lose it, and that’s very inefficient. We are working with batteries as a storage mechanism that locks that power in, because energy usage is not always consistent. Energy is not used as much at night, and can fluctuate during the day due to various factors like air conditioning loads.

**What’s the heart of the issue with the future of the battery?**

The complexity of the battery is that it’s not a single entity. Batteries are more difficult because you are creating electricity, but it’s really a chemical reaction. You have chemistry and a chemical engineer involved in creating that electricity. And you need to contain it in some kind of housing, which involves a mechanical engineer. All those components have distinctively different disciplines but have to work together.

**How does this future of energy impact our economy?**

Energy has a huge impact on the economy. Renewable energy sources are critical, and it’s worth the risk to anticipate what our energy needs will be, and then power them in a way that is less dependent than the energy we use today.

**Let’s talk about the future. How do concepts like augmented reality coming into manufacturing and the Internet of Things play into our future?**

We can now simulate and connect things we never have been able to do before. And we don’t fully understand how much of an impact this can have. We understand that there is great potential in augmented reality, but when you put an artificial intelligent algorithm against it, then will decisions be made from knowledge we don’t have the capability to deal with? Most of us cannot fully comprehend the impact, as we’re still in the Gen1 Gen2 of the connected world.
Tom Gebhardt serves as Chairman and CEO of Panasonic Corporation of North America, a leading technology partner and integrator to businesses, government agencies and consumers across the region. The Newark, NJ-based company is the principal North American subsidiary of Osaka, Japan-based Panasonic Corporation and the hub of Panasonic’s U.S. branding, marketing, sales, service and R&D operations.

In addition to leading North American operations, Tom also serves as an Executive Officer of Panasonic Corporation, and is responsible for formulating and executing Panasonic global business strategies.

With Panasonic for more than 30 years, Tom previously led Panasonic Automotive Systems Company of America to become the largest and most dynamic of Panasonic’s North American businesses. He has also served as President of Panasonic Industrial Company, President of Panasonic Factory Solutions Company, and General Manager of Panasonic Battery Group.

Tom also serves as a Director on the Boards of Hussmann (A Panasonic Company), Cedar Electronics Holding Corp and New Jersey Performing Arts Center.
A complete list of all the digital industrial companies in the world today:
1. GE
2. See 1

Over the past year, we have transformed our business to become a digital industrial company, merging machines and analytics on a massive scale. How did we do it? By reshaping our portfolio around core strengths like sharing software and technology across our products and services, while expanding margins and making our businesses more efficient. The result: a more streamlined, profitable and focused operation.
“We partner with brands to make things ‘Shazamable.’ We’ve managed to take the word ‘Shazam’ and turn it into a verb and a noun and every other part of speech.”

Robert Reiss: As CEO, how would you describe the Shazam brand?

Rich Riley: Shazam is one of the world’s most popular apps, used by hundreds of millions of people around the world primarily to identify music, to discover new songs, to learn about artists, to share music and lyrics, and more. We also partner with brands around the world to enable users to engage with brands and also with artists directly.

How do you partner with brands?

We partner with brands to make things “Shazamable.” We’ve managed to take the word “Shazam” and turn it into a verb, a noun and every other part of speech. We have actually had our logo put on hundreds of millions of items such as Coke bottles, Kit Kat bars and cereal boxes to name a few. You can Shazam those things and we can deliver an experience on behalf of the brand or a game or video experience or an augmented reality experience. It’s a clever way for a brand to engage users and to turn printed things or packaging into a source of engagement. We also do the traditional display adver-
“We have actually had our logo put on hundreds of millions of items such as Coke bottles, Kit Kat bars and cereal boxes to name a few. You can Shazam those things and we can deliver an experience on behalf of the brand or a game or video experience or an augmented reality experience.”

What is the process to connect with the Shazam brand?

We have teams around the world that represent us and work with leading agencies and brands and are happy to engage in brainstorm around how to use the platform and drive engagement, and Shazam-enable whatever it is they want people to have one-touch access to from their mobile phone.

Let’s start with your personal history. I want to talk about Rich Riley 1999. Is it not true you sort of created the first toolbar? This is something people don’t know about the CEO of Shazam.

I went to Wharton undergrad, then straight to Wall Street and was an investment banker at a firm called DLJ, and I really thought I would spend my career in finance. We were just starting to use the Internet so email was common but it was still a lot of voicemails and things along those lines in 1999.

One night on a plane, I had an idea around trying to organize usernames and passwords because every site, every service wanted a different username and a different password. I asked my friend in the IT group at the investment bank, “What service would help me do this?” and he didn’t think there was one. We were both sort of entrepreneurial at heart. With DLJ’s blessing, on the side, we started working on how to solve that problem. First, we created a website called Log-Me-On.com, which was the name of the company, and then we needed to figure out, “What if we wanted to obsolete that?” At that time, no one had figured out how to make something persistent in a browser. Fortunately, my friend’s younger brother is an incredibly talented coder, kind of a hacker, and figured out how to make that toolbar persistent in the browsers. As soon as we had that figured out, we immediately filed patents and then thought, “This would be more powerful as part of a bigger platform than as a standalone company.” We reached out to Yahoo, Excite and Lycos, who were the big three Internet giants at the time, and got calls back from Excite and Yahoo, negotiated to sell the company to Jerry Yang and I started there in 1999.

That’s pretty exciting. Every time you see a browser, a toolbar, do you sort of pinch yourself and say, “Gosh! I was a part of that creation.”

That’s our little contribution to society, yes.

That’s great. It’s sort of a parallel path to Jeff Bezos when he was in finance at D.E. Shaw and had this crazy idea for Amazon. You did sort of the same thing of creating value.

I’ll take that comparison.

You were at Yahoo for 13 years as EVP of Americas. What did you learn personally about leadership philosophy while you were at Yahoo?

When I first went to Yahoo I was 25 and so I negotiated the sale to Jerry Yang personally and he said, “We’re impressed with how you’ve handled this. Why don’t you come do deals for us?” So I moved to San Francisco and started out doing corporate development for Yahoo, which was fun.

I want to just go back. Is there anything you learned as a 25-year-old in that meeting that’s memora-
ble to you that you carry on in terms of your philosophy on business?

Yes, two things. One was the advice my dad gave me when we were negotiating between two companies and with Yahoo. My dad said, “Don’t be greedy, especially with your first-ever liquidity opportunity.” And he said, “Whether you get X or 10X on this, if you get 0X, you’re going to regret it forever.” It was really good advice and to me, it was an example of not always trying to push a deal to get the last little bit or being perceived as being greedy. We played our hand well and that advice helped to do that.

The second part of that was, I’ve always thought, “You want to be easy to do business with.” Whether it was the interactions we had with the Yahoo team and with Jerry, a company like Yahoo doesn’t have to do a deal like that. Part of it is, do they like you? Do they want to work with you? Those sorts of things.

From early on, my thinking has been, “I always want to be the easiest and most responsive person to deal with, and make this as pleasant as possible for both of us,” and make this a huge win for, in that case, Yahoo, and that served us really well.

It sounds like it stayed with you to this day?

Absolutely. It’s a big belief of mine that there are benefits to being easy to do business with.

Let’s go back to Yahoo and what you learned in your 13 years there.

I went to Yahoo, initially as a dealmaker, and there were still several years of dot-com boom left. It was almost too easy because you’d go and do your thing and get back to your desk and the stock was up 20 points every day so I’d say, “Well, I must be doing something right. This is great.” Then I lived through the dot-com bust and that was pretty extreme for all my friends. Everybody had moved to San Francisco at that point and companies were folding up; it was hard for business for the first time because the Internet had been really, really easy for a while. For me personally, I learned a lot about how hard it could be. Also, my instinct was, “Yahoo needs me more than ever now. The last thing I’m going to do is leave them and say, ‘Hey! Oh, I’m sorry. I’m out.’” In business you learn there are good times and hard times and it’s all part of it and sometimes it’s driving to the hard times when you learn the most.

The other really neat thing about Yahoo was, every 18 months or so, they would just give me some huge responsibility that would keep me very interested. I went from being a dealmaker to being an operator, and running and really building a small-to-medium business division where we posted websites and provided email, and I had to learn about subscription services, payments, customer care centers and things like that.

Let’s fast forward to 2013. You come to Shazam, founded in 1999. What was it like becoming the CEO of the Shazam brand?

It was wild. When I left Yahoo, there were over 15,000 employees. It did become a big company and I reported to the CEO. So it was an adjustment going to a company that had less than 200 employees. I had a big brand but it was a small company, so that was a bit of culture shock even if it isn’t recognized as culture shock.

As another CEO told me, “You don’t realize it, but when you’ve been somewhere for 13 years, you have become really good at working there, you look at things through a lens and you have to teach yourself to really adjust your lens when you go to a smaller place.” When I really wanted to go be a CEO and I looked around, Shazam really caught my attention because of the brand.

It was a mobile-first company and this was right when most companies were really struggling with, “How do we convert to the mobile experience from our legacy business?” Shazam didn’t have that problem. It was mobile from day one and users loved it. My thinking was, “With the brand, the user base and this mobile platform, let’s see where we can take this thing.” And that’s what I signed up to do.

What was the story with the Beat Shazam TV show, and how Jamie Foxx became involved?
“One of the first things we had to do was go find a host and Jamie Foxx was our first choice from day one. Mark Burnett described him as a quintuple threat because he’s an accomplished actor, accomplished musician, he can sing, he can dance, he’s a comedian.”

We had companies from around the world approach us around Name That Tune-style TV concepts over the years, and it was always hard to know. It was a serious group; however, a lot of entertainment projects get talked about and end up not going anywhere. We were approached by Jeff Apploff, who had done several shows around music based in L.A. We started talking to him and the next thing you know Mark Burnett is involved. If Mark Burnett is involved, it’s usually a success.

If Mark Burnett is involved, it’s usually a success.

There’s probably no greater indicator of success for a TV show than having Mark Burnett involved. When Mark Burnett flew here to meet me in his office in New York, that’s when things got serious pretty quickly, and then Foxx got involved. It came together fairly quickly. It’s a modern-day Name That Tune and we had figured out a lot of the gameplay, how it would work and how fun it would be to compete against Shazam. One of the first things we had to do was go find a host and Jamie Foxx was our first choice from day one. Mark Burnett described him as a quintuple threat because he’s an accomplished actor, accomplished musician, he can sing, he can dance, he’s a comedian. It’s just amazing.

Watching Season 1, we would have time to tape three shows in a day and it takes a while to tape a show that gets converted into the hour-long format. It was amazing to watch the stamina that Jamie Foxx has – to be witty, lead the show between takes, turn around and entertain the 400 people in the audience, go back to the show and do three of those in a day and he honestly did not look tired at the end of it. At the beginning, it was just unbelievable and even the people I was watching the filming with, even with all that they do, they said it’s incredibly rare to see that kind of talent, that kind of passion and even that kind of audience interaction. Having Jamie as part of the show has just been fantastic.

You’re actually an executive producer, right?

Yes. I’m one of the executive producers along with Mark, Jeff and Jamie and then also one of our board members, Lauren Zalaznick, who was formerly with NBC and has a lot of TV experience, who also understands Shazam.
“Our internal value statement is “Deliver magic together.” Our users tell us they associate our product with magic and you’ll see quotes in user reviews saying, “This is magic. This is sorcery. How does this work?” It’s a really high standard. I studied business at Wharton and I don’t think in my marketing classes, magic was one of the things that you even aspire to. Very few companies can credibly use that word but we think we can and we have really embraced it.”

It’s been a lot of fun.

What would you say is at the heart of the Shazam company today?

Our internal value statement is “Deliver magic together.” Our users tell us they associate our product with magic and you’ll see quotes in user reviews saying, “This is magic. This is sorcery. How does this work?” It’s a really high standard. I studied business at Wharton and I don’t think in my marketing classes, magic was one of the things that you even aspire to. Very few companies can credibly use that word but we think we can and we have really embraced it.

We thought about various value statements and most companies, if you look at their values, use the same words. We work through ours and dabble in what’s unique about us. Aspiring to deliver magic is really special and then together, we get to the real parts of our culture, which is around being a team and teamwork and really nothing right ever happens without the whole team pulling together.

As I’ve mentioned, we have a very young global culture. Many people here have real passion for music and technology and it’s a really fun group – we do a lot to embrace that culture and make sure it is fun whether it’s having artists in the office continuously, whether it’s having parties and an all-hands meeting and doing fun things together. We really do try to make it a fun place for people to come every day.

One of our traditions here in New York is Whiskey Thursdays. It’s a way that this office likes to spend some quality time together and each office is empowered to come up with its own cultural events and ways that they want to hang out.

You have one of the largest digital communities in the world. What can CEOs learn about building a digital community?

We’re one of the highest-rated apps in terms of user ratings in the world, so we’re about a 4.9 out of 5 stars, which very, very few ever achieve. Most people would celebrate a 4.3. Our guys are frustrated that we don’t have the 5 instead of the 4.9. One of the reasons users like Shazam is, we take seriously doing what we’re supposed to do. People want to open an app, they want it to open fast, they don’t want anything in their way, and they want it to work the way they want it to work. Every day we try to make our app faster and better, so we recognize more music in more challenging environments. Whenever we’ve tried to add new functionality at the expense of the core experience, users react. I think a lot of companies take their eye off that ball. We have a simple reminder that people expect Shazam to work fast every time and deliver that magic. We keep trying to exceed their expectations on that and stay really focused on it.

“Many people here have real passion for music and technology and it’s a really fun group – we do a lot to embrace that culture.”
Every day we try to make our app faster and better, so we recognize more music in more challenging environments. Whenever we've tried to add new functionality at the expense of the core experience, users react. I think a lot of companies take their eye off that ball.”

Let’s change gears. You and I met at an event, Unchain, a couple of weeks ago. And I thought, “Wait, I’m interviewing him in two weeks.” It’s wonderful what you’re doing at Grace Farms.

‘Unchain’ at Grace Farms is a truly important charitable campaign focused on increasing the awareness of modern slavery and the Geometry Global advertising agency is one of their partners. Since we work with them and other agencies to help brands deliver interactivity and deliver messages, we were approached about applying our capabilities and platform towards helping a charitable cause. We’ve done some various things over the years but we really just launched our augmented reality capabilities in 2017. This became the first chance for us to really use augmented reality to help a charitable cause and the cause really resonated with our team. We are a very global, young team. Shazam has over 200 employees from over 30 nationalities, and they were really excited about it. We worked with them on this amazing hummingbird sort of icon and we were excited that we could bring it to life. You could Shazam the invitation to this event and the hummingbird flies around on your phone. We also are able to make parts of the event itself interactive and it’s just a really fun way to apply our technology to making the world better.

Unchain at Grace Farms is a truly important charitable campaign focused on increasing the awareness of modern slavery.”
Robert Reiss: Many people call you an inventor. What does that title mean to you?

Jay Walker: An inventor is, or should be, a problem-solver. He or she sees a problem that other people have decided to just live with, or sees something that other people may not realize is a problem. And the inventor says, “Maybe there’s a way to solve this in a really useful way, perhaps by applying new thinking or new ideas from other fields, or possibly with new technology.” But creating a useful, successful invention is a bit like solving a Rubik’s Cube. You have to get all six sides right for it to count; getting four sides right isn’t good enough.

You are named on more than 750 patents which makes you one of the top inventors in the world and places you at the forefront of innovation globally. Where do you come up with your ideas for innovation?

I try to immerse myself in the world’s knowledge. I spend time looking at the history of business. I study general history as well. I talk to people all the time. By the way, I’m also a consumer. I buy business travel; I buy life insurance; I buy health care. I, just like you, go to the Department of
Motor Vehicles and say, “You have to be kidding! This is the best system to renew your driver’s license?” I’m no different than anybody else. The difference is my day job is thinking about that, whereas most people’s day job is doing something else. If your day job was thinking about business systems all the time, you’d be working on the same problems I am. It often comes down to me thinking, “You know what? I can figure out how to improve that system.” There never is a moment when I or my colleagues at our invention lab say, “Aha!” and then pop champagne corks. That’s just not how we work; but I’m constantly chipping away at certain classes of problems.

Now that the world is completely digital, does that change the concept of innovation, or do the same principles of innovation remain?

You mean, has anybody reinvented the concept of invention? Yes and no. Innovation is about useful creativity. When it’s about using that creativity to solve business problems and especially consumer problems, then part of the innovator’s focus is on human nature – which does not change. We can predict how people are going to react to things, what they will like and not like, because human needs and drives are largely a constant. But does the digital layer change the process and nature of innovation? Yes, in many dimensions. Putting aside all the questions about what constitutes novelty and utility in, say, software design, the simple fact that everything now has an information layer, and that layer has value and can be manipulated in countless ways and connected to other information systems, is itself transformative. We live in a more complex world by far than 100 years ago, but also a world that is infinitely richer in terms of possibilities. This is the greatest time to be an inventor in human history.

What is the key for CEOs if they want to innovate successfully?

The key to innovation is focusing on the real issue. After that, then ask the right questions, which most people spend very little time thinking about. They’re very busy trying to come up with the right answer. Instead, I advise asking the right questions and then intensely and relentlessly borrowing from Sam Walton’s book, as I did. I’d much rather have the right question than the right answer. It’s all about the customer – beginning, middle and end. Most people, however, are not relentlessly focused on customers and their needs. Instead too many entrepreneurs and business people fall in love with their idea for a new product, or a new process, or some whiz-bang new technology.

But how does one know what the customer really wants?

Frankly, that’s an art and a science. Truth is, if you asked Steve Jobs when he was living that question, he would have said, “I don’t know what the customer wants. I just know what I want and I believe there are a lot of people like me.” Other people like Sam Walton would have said, “You know how I know what the customer wants? I see what moves on the shelf. If it doesn’t move on the shelf at that price, I know the customer doesn’t want that product at that price.”

We live in a data-driven world. More than ever before, we can see the data that tells us what the customer wants – but there is still plenty of room for artistry here. Many customers don’t know what they want until they see it, especially if they haven’t seen it before.

There’s so much data. How do you know how to ferret through to find what’s truly important?

That’s an artist’s question. You don’t know; you simply iterate. I can only tell you that whenever I’m inventing, by the time we bring a product or a service to market, it’s gone through hundreds and hundreds of revisions. There isn’t anybody other than Mozart who is going to have a finished symphony when they take it from their head to paper the first time. It’s about endless iteration. It’s about asking real customers, finding people who are willing to
be honest with you and then constantly trying different ways to do things.

That said, the iterative process doesn’t take the genius out of the final result. There are geniuses who can create hit songs much more frequently than you and I. They’re clearly incredibly talented at it. But not every song they write is a hit song or, as Bernstein liked to say about pop music, survives the test of time.

**What are your thoughts on building a culture of innovation and is the best path to have everyone focused on innovation or just a few really smart insightful people focus on innovation?**

Building a culture of innovation is not just about teaching more people how innovators think. And yes, there are certain skills and habits of mind that contribute to that; and yes, to some extent they can be taught. But building a culture of innovation is also about changing the culture of the organizational environment to be more receptive to change. The greatest innovation in the world is no good if people refuse to use it. Remember, when Ignaz Semmelweis told his fellow 19th century surgeons, “We’ve got to wash our hands before and after treating every patient; otherwise we risk infecting them” – a generation of doctors rejected this notion out of hand. We’ll never know how many patients died needlessly as a result. We’ll never know how many patients died needlessly as a result. So teaching a specific organization or a particular field to be open to embracing innovation is an equally important part of the challenge. Everybody talks about embracing and encouraging innovation, but far fewer of them actually “walk the walk.”

**Let’s talk about some of your innovations. Start with Priceline.**

Before Priceline, it wasn’t possible for a customer to say, “Look, here’s the price I’m willing to pay. I’m willing to be extremely flexible. Is there any airline out there willing to transport me from point A to point B on the day I need to go?” You had to be a leisure traveler; you had to be very flexible; and you had to be driven entirely by price. That’s how leisure travelers often are. Priceline changed that game.

**And your latest innovation is Upside Business Travel.**

Now we’re working on a different dimension entirely. We’re serving travelers from small to medium sized businesses, the ones who don’t have volume deals, the ones who don’t have travel departments who arrange and buy their flights and hotel rooms for them. It turns out these small business travelers spend about $165 billion a year and they have no help at all – no help wading through hundreds of choices, no customer service, nothing. So what is the problem we’re trying to solve? A business trip is a high-friction experience. Dozens of possible problems can derail the most carefully planned itinerary, and you often get no notice it’s about to happen. Canceled flights, delayed flights, disappearing hotel reservations, endless taxi lines, unexpected traffic jams, clients who reschedule meetings at the last minute. Any one of these incidents can cause a domino effect that plays havoc across your entire trip. Business travelers need 24/7, concierge-level customer service that not only helps them buy airline tickets and book hotel rooms, but helps when these problems inevitably arise...and in fact, anticipates problems and solves them before you even know the problem has occurred. That has been prohibitively expensive in the past, or in some cases, it was not possible at any price. But we have invented a new platform from the ground up that is designed to provide this level of service, both proactive and reactive, at a very low variable cost. Our platform is called Total Trip. It combines live expert help on the phone with AI-driven software help, available by voice, chat or other channels 24/7, and there is no extra charge or fee to the traveler. For example, you might get a text mid-flight that says: “You’re going to land at O’Hare 45 minutes late and miss your connection. We have canceled that connecting flight and rebooked you on XYZ Airlines, departing O’Hare in a time window that you can comfortably make.” Or in the middle of a meeting with your first client, you could get a notice from Total Trip that says “If you want to be on time for your next meeting across town, you need...
to wrap this up in 10 minutes and get moving. Would you like us to call you an Uber for 15 minutes from now, or should we contact your next appointment and advise them you’ll be running late?”

Is there any smart technology now that’s enabled this to happen?

Total Trip integrates a number of technologies in a new way, including AI, machine learning, natural language processing, cloud computing, and GPS into a seamless new travel support architecture -- and also integrates that system into the travel industry’s existing infrastructure. But from the customer’s point of view, all of that technology is almost invisible. The traveler simply knows they get effective, professional help whenever they need it, so their trip is more successful.

The traveler gets these benefits and the company saves money. It’s a very simple model.

We’re doing all that work in the background so you don’t have to do it when you’re on your phone or on your desktop. But like a human travel agent, we also take your unique needs and preferences into account, so every trip is customized just for you.

Can Upside’s Total Trip concept work in industries other than travel?

Yes, and we expect this to happen. What’s happening here is that travel is finally catching up with what other industries already offer in terms of a seamless, integrated, personalized, location-aware, on-demand, socially connected consumer experience. Amazon and Google already provide this. So do Facebook, Apple, Waze and Netflix. But there are industries that were not designed from the ground up to provide this kind of customer support, and Total Trip can become a utility that many industries use some variation of.

Let’s now look at how technology will transform business in the future.

Nobody knows what’s next in terms of the weather, but we know what’s next in terms of the climate. That’s what I often tell people. I can’t tell you the weather next July 20th but I’m going to tell you it’s probably not going to snow, except if you’re skiing in Chile. To be a student of technology, you really must study it from the beginning. By looking at events and developments from the 18th or 19th centuries through today, you can see very clear trend lines, you see very clear patterns. For example, we can see
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Jay Walker  Founder & CEO Upside Travel

“By looking at events and developments from the 18th or 19th centuries through today, you can see very clear trend lines you see very clear patterns. For example, we can see that the cellphone is going to go away.”

that the cellphone is going to go away.

The cellphone will go away?

Yes, it’s just an intermediate form factor. The idea of carrying around this physical brick with this limited screen is clearly silly. The cellphone is simply an accommodation in a transitional period. The cellphone will go away and what’s going to happen is your glasses or contact lenses are going to have an augmented reality layer that will allow you to see whatever it is you need to see. It’s silly to hold a screen. The glasses are a perfect screen and it’s clear there will be a way to overlay data as well as pictures and images in video screens so you will wear the network access. You’re going to have a device by the ear that allows you to directly hear so that you’re not holding anything to your ear.

Whether it’s going to happen in two years, three years, five years or even ten, I can’t tell you that. Those are weather questions, not climate questions. I can tell you it’s absolutely certain that the hand-held phone will go away as a form factor.

Connectivity is going to rapidly improve because humans are genetically wired to connect. We like being connected to people. We like sharing. Look at the scale of Facebook. Look at the ubiquity of social media. What is that all about? It’s about a set of forces which involve gossip, voyeurism, sharing insecurities - those things all drive the human animal. We can tell that anything that increases connectivity is going to be more and more popular, especially at zero variable cost. We live in a world where the cost of connectivity is itself a very low marginal expense.

But Google Glass never really took off.

Pay no attention to the fact it didn’t rain yesterday. How nice! Connectivity will migrate to the regular glasses or contacts you wear.

I don’t wear glasses.

You just put them into contacts then.

I don’t wear contacts.

You will when it saves your life.

Everyone will then be wearing contacts or glasses, so it’s not a fashion thing, and you’ll be able to talk through your ear.

Exactly, it’s what’s going to save your life. It’s going to keep all your medical information. When anything’s wrong, you’re going to be able to see a warning. When that technology becomes available, affordable and reliable, you would no sooner go out without your augmented reality than you’d leave your house without shoes. In fact, your insurance company might offer you lower premiums if you’re always connected.

How will the digital world impact our economy?

The Flexibility Economy is coming. We’ve all heard of things like the sharing economy or the gig economy. The Flexibility Economy is shorthand for the idea that small amounts of flexibility are going to start to become monetized by both buyers and sellers. We already see this in insurance, where every insurance policy can be different; it just depends on what you want. 100 years ago, Henry Ford said you could buy a Model T in any color you wanted, if you wanted it black. Now, every car coming down the assembly line has different options, different colors, different packages. That’s the world we’re living in.

We are going to customize in real time using data tools on almost every purchase we make, because it’s not simply the object we’re customizing; it’s also the package of services that surround it. Do you want to buy this phone with a warranty? What kind of warranty, with what kind of privileges? Do you want to buy it with this? There is

“The Flexibility Economy is shorthand for the idea that small amounts of flexibility are going to start to become monetized by both buyers and sellers.”
My advice to CEOs would be to pay more attention to history.

A whole set of environmental factors that surround every purchase we make. You’re going to be able to price each one of them separately and decide which ones you want in real time like that. Why is this going to happen? Because it can, and when consumers see it they’ll want it. Companies that figure this out and connect to the customer in that way will be the successful ones.

My advice to CEOs would be to pay more attention to history. History teaches us so much that will surprise you. The people who’ve lived before us, or the people who’ve solved the problems you’re working on, many of them were very talented. There’s a lot to learn from historical people who are business people. You could spend most of your life studying Sam Walton alone. A lot of CEOs are so busy in the moment and so busy in the immediate future that they forget the past has an enormous amount to teach them.

What is your final advice to CEOs?

Mr. Walker is best known as the founder of Priceline, which brought a new level of value to the travel industry. Today, Priceline is a highly profitable public company with millions of active customers and a market cap of $90B. The business processes that guide Priceline’s success were created in the invention lab of Walker Digital. A Patron of the world-famous TED organization, Mr. Walker is the Curator and Chairman of TEDMED, the health and medicine edition of TED, whose online talks have been watched more than one billion times.

Mr. Walker serves as the Executive Chairman of Walker Innovation. This public company owns and seeks to commercialize, license and enforce the unique portfolio of intellectual property developed by Mr. Walker, who is one of the world’s top ten most patented living inventors and a named inventor on more than 750 US patents. His inventions provide unique business systems and solutions across a dozen different industries.

A serial entrepreneur, Mr. Walker has founded three companies that each serve more than 50 million customers. He co-founded Synapse Group, a company that used the credit card processing network to revolutionize the magazine subscription business, serving as its marketing leader and creating a customer database of 25 million active buyers. For his work, he won the Direct Marketer of the Year award in 1999. Synapse is now a unit of Time Warner.

He has twice been named by the editors of TIME magazine as one of the “50 most influential business leaders in the digital age.” BusinessWeek selected him as one of its 25 Internet pioneers most responsible for “changing the competitive landscape of almost every industry in the world.”
How do you put your brand into a consumer’s mind?

That’s the problem marketing was invented to solve. The traditional marketing approach was to compare your brand with all the other brands in your category and then run a marketing program promoting your brand’s features and benefits.

Years ago, BMW was introduced into the American market with a traditional marketing approach. Here is a typical headline: Our new BMW is a unique combination of luxury, performance and handling. And it’s amazingly easy on fuel. After decades of this type of advertising, BMW was nowhere. (It was 11th in sales among imported European cars.)

Then BMW changed its strategy to The ultimate driving machine. How successful was BMW? The brand became the largest-selling luxury-vehicle brand in the world, ahead of Mercedes-Benz, Audi, Lexus and Cadillac.

Why did this happen?

If you could look into a mind, you won’t find a list of brands, all filed neatly in alphabetical order. What you will find is a group of categories. Automobile categories might include cheap cars, mainstream cars, expensive cars, trucks, sports cars, etc. Cheap cars might include brands like Hyundai and Kia. Mainstream cars might include Toyota and Chevrolet. Trucks might include Ford and GMC. Sports cars might include Porsche and Ferrari.

Consumers don’t really buy brands. They buy products or services. When they want to buy something, they look into their minds to find what brands can be found in the category they want to buy. Years ago, the leading imported luxury vehicle was Mercedes-Benz. At the time, Mercedes vehicles were large, comfortable, expensive automobiles. What BMW did was to position its brand against Mercedes. The first advertisement in the campaign had the headline: The ultimate sitting machine vs. the ultimate driving machine.

From a marketing point of view, BMW needed to first deal with Mercedes before the brand could get into the buyer’s mind. It’s easy to get into a mind if you are the first brand into a new category. Coca-Cola in cola. Gatorade in sports drinks. Red Bull in energy drinks. But if you are not first, then you need to position your brand against
the brand that got there first. And the best way to do that is to make your brand “different,” not necessarily better.

After the introduction of Red Bull, there were more than a thousand brands of energy drinks introduced into the American market, almost all of them in the 8.3-oz can pioneered by Red Bull, except Monster which came in a 16-oz. can. Today, Monster has a 39 percent market share, compared with Red Bull’s 43 percent share. Coca-Cola’s Full Throttle brand has just 1 percent.

In the digital era, the biggest mistake a company can make is to try to put one brand into two different categories. IBM was the most-profitable company in the world when it introduced the first 16-bit office personal computer, the IBM PC. After 23 years and $15 billion in losses, IBM sold its personal-computer operations to Lenovo, a Chinese company, for $1.75 billion. In the minds of most prospects, the IBM brand is in a category called “mainframe computers.” Why would a prospect even consider buying a PC from a mainframe company?

Yet, many companies make the same mistake. They try to move their brands from one category to another. Kodak was one of the best-known, most-loved brands in the world. Kodak even invented the digital camera. But when Kodak tried to move its “film-photography” brand into the digital category, the company went bankrupt.

A number of years ago, Sony was recognized as the No.1 consumer brand in both America and Asia. Yet when Sony tried to move its brand into computers and smartphones, it failed miserably. In the past 10 years, Sony has lost $6.2 billion on sales of $77.1 billion.

At the turn of the century, Apple was a relatively small company with annual sales of $5.4 billion and very little profits. (That year, the company lost $25 million.) Sixteen years later, Apple was the most-valuable company in the world, worth $886 billion on the stock market.

Three developments made Apple the company it is today: the iPod, the iPhone and the iPad. They did the two things you need to build a powerful brand: (1) Being first in the mind in a new category, and (2) Using a new and unique brand name. The iPod, launched in 2001, was the first high-capacity music player. The iPhone, launched in 2007, was the first smartphone. And the iPad, launched in 2010, was the first tablet computer.

Once a company makes a strategic mistake, it’s very difficult to recover. In 1985, shortly after introducing the IBM PC, IBM was the 5th largest American company and the world’s most-profitable company. In 2002, IBM bought the consulting arm of PricewaterhouseCoopers for $3.3 billion. Since then, IBM has bought more than 100 companies. It hasn’t helped.

Today, IBM is the 32nd largest American company and continues to move downward. In the past six years, IBM revenues have declined 26 percent and its profits have declined 64 percent.

Today, Apple is the third largest American company and the world’s most-profitable company. In the past six years, Apple’s revenues have increased 112 percent and its profits have increased 87 percent.

The future belongs to multiple-brand companies like Apple. Not single-brand companies like IBM.

Branding guru & bestselling author Laura Ries is an internationally recognized branding expert, best-selling author and television personality. After graduating from Northwestern University, she worked at TBWA Advertising before partnering with her father and positioning pioneer Al Ries. For more than two decades, the dynamic duo has been consulting with companies around the globe including Disney, Ford, Frito-Lay, Papa John’s Pizza, Samsung and Unilever on strategy. Laura has co-authored five books including: “The 22 Immutable Laws of Branding”, “The Fall of Advertising & the Rise of PR”, and “The Origin of Brands.” Laura’s book, “Visual Hammer” has been translated into the Chinese, Russian, Turkish, Polish and German languages. Words alone can’t build a brand, driving an idea into the mind is best done with the emotional power of a visual.
Of the 1,000 business books I have read it is rare to find one that truly predicts the future – SUBSCRIBED: Why the Subscription Model Will be Your Company’s Future – and What to Do About It (Portfolio/Penguin Random House), is such a book. Its author, Zuora Founder and CEO Tien Tzuo, is the visionary who coined the term “The Subscription Economy” and in his book, he shares what it is, and why the smartest of CEOs are incorporating subscription models into their own businesses. This definitive guide for how to succeed in the Subscription Economy shares the systemic truth of why companies like Netflix, Salesforce, Amazon and Spotify have such great success. It’s all based on the one concept which it clearly seems will drive the future of business – the subscription economy.

The world is shifting from products to services, from ownership to access. And, with this shift, subscription models appear to be the future of business. Most companies, however, are set up only to sell products. And, as Tzuo describes in Subscribed, this represents huge opportunities for both established companies and their ambitious competitors. Companies that can develop a relationship with their customer, providing a service they can subscribe to rather than mindlessly developing products, can attain a significant advantage in the market. And, as consumer preferences shift further toward subscription services, Tzuo asserts that this will become a necessity: “Big changes are coming. If you don’t find out who your customers are in the next five to ten years, you will fail. Smaller start-ups are taking down huge enterprises simply because they know who they are selling to.”

With a standard service, Tzuo explains, any product could be turned into a subscription: “Here’s the secret… tease out the service-level agreement that sits behind the product. It works for everything. So instead of a refrigerator, it’s the guarantee of fresh, cold food. Instead of a roof, maybe it’s a guaranteed source of solar energy.”

Tzuo describes Adobe’s successful transition to a subscription model. In 2011, Adobe was thriving, with its licensed software business generating more than $3.4 billion in revenue at a 97 percent gross margin. However, Adobe was growing primarily due to price increases; the user base wasn’t growing. And while customers had rapidly changing content-creation requirements, Adobe was only updating its product every eighteen to twenty-four months. They stepped up their marketing and their product updates, but couldn’t obtain the returns they needed. Adobe, recognizing its need to change, announced it was to stop selling its Creative Suite software and begin providing a digital subscription service. Although investors expressed uncertainty at this decision, it paid off; over the next six years, Adobe’s stock rose from $25 to over $190, growing at 25 percent a year.
Fender, a guitar company, struggled in its sales, as guitar sales industry-wide had fallen by around 30 percent through the past decade. Fender, though, recognized its customers and was able to determine the root cause of its faltering sales. Half of Fender’s sales were to new guitarists, but around 90 percent of them quit within their first year. The company determined that if they could find a way to keep their customers playing the guitar, Fender would gain lifelong customers. This caused Fender to launch Fender Play, a subscription-based online video teaching service. Fender’s intentions were clear: to turn guitar buyers into guitar players, and to attract these players into their user base.

Tzuo explains, however, that switching to a subscription model is not as simple as providing a different type of service. It requires a fundamental restructuring of the way the company functions. Engineering, marketing, sales, finance, and IT teams all need to shift their priorities in the face of the subscription economy. Subscribed details the steps that each department needs to take, how engineers must always be experimenting in beta and how finance has to rework the manner it presents income statements. Above all, the culture of the company needs to be rebuilt from the ground up. Being a customer-focused company is a concept that is easy to grasp but difficult to realize. Tzuo describes why: “Product cultures are built around thinking and organizing like assembly lines: stay in your lane, do your job, then pass it on to the next person. That no longer works.”

He then describes the subscription operating model, “PADRE,” developed by Zuora which visualizes a company as an integrated organization with subsystems centered on the customer. This is significantly more difficult than rebranding: “And here’s the most important part – the only way these individual subsystems can succeed is with cross-functional coordination...if one department is having a problem, the answers to that problem are invariably scattered throughout the rest of the organization.” And, through this transformation, business becomes simpler.

In summary, for CEOs to become subscription businesses and capitalize on this new subscription economy, companies should reevaluate the product they provide and attempt to determine the base-level service behind that product. Then, begin to test out manners to provide the service in a subscription format, restructuring the company’s business model in the process. And, through the entire process, always stay completely aligned with emerging customer preferences. As Tzuo reinforces, “At the end of the day your customer insight defines who you are; it’s your competitive advantage. Lose the insight, and you lose yourself.”

Tien Tzu, Founder & CEO, Zuora. Mr. Tzu served at CrossWorlds Software, where he launched CrossWorlds’ Telecommunications business unit focused on integration with billing systems such as Portal, Kenan, Amdocs and MetaSolv. Prior to CrossWorlds, he spent over six years at Oracle Corporation in a variety of sales and professional services roles and managed several of Oracle’s largest Telecommunications accounts, including MCI, NYNEX, Verizon (formerly, Bell Atlantic) and AT&T. He serves as the Chairman of the Board of Zuora, Inc. He has been a Director of Groundspring.org Mr. Tzu has been a Director of Sailthru, Inc. since September 03, 2013. He has been a Member of Advisory Board at Cloud9 Analytics, Inc. since July 2008. He served as Director of Radian6. He is also widely recognized as one of the thought leaders in the software-as-a-service industry. In 2004, he was named CMO of the Year Finalist by the CMO Council and BusinessWeek Magazine. He holds a Bachelor’s Degree in Electrical Engineering from Cornell University and a Master’s in Business Administration from the Stanford Graduate School of Business.
“Proof-of-Asset Protocol is similar to the gold standard. It means that we issue some token on the blockchain. It’s a digital record, something that represents value.”

Bill Peters: As Founder and CEO, why the BANKEX name?

Igor Khmel: We chose BANKEX as a trademark because it means Bank Exchange; it’s the exchange of the trade of cryptocurrency for banks. Our central aim is to engender trade between banks with different products. Secondly, it also represents ex-bankers, because most of the top management, most of the founding partners on the team who joined me are ex-bankers.

Explain your mission.

Our mission is to build the Internet of Assets. BANKEX develops new transparent, digital economic tools, products and services on the blockchain that constitutes the technological engineering underpinning for powerful, flexible and inclusive fintech ecosystems. These ecosystems meet the demand for the leading majority of financial organizations that will survive the transition into the era of decentralized capital markets. The BANKEX platform merges the world of physical assets and global dig-
Italy ecosystems. Our flagship technology is the Proof-of-Asset Protocol, which transforms real assets into a highly fungible digital smart asset for any legal jurisdiction in the world, optimizing liquidity and connecting the global financial systems. We are committed to open and transparent markets and financial inclusion.

**How do you define “Proof-of-Asset Protocol”?**

Our Proof-of-Asset Protocol is similar to the foundation of which the gold standard was based on. In our case, we are issuing a token on the blockchain, one that represents something of value that you have complete ownership of.

**There’s a transparent history of each token, correct?**

Yes, there is clear history and predictions. There are both, the history and also our estimation of its value based on its history.

**Some say bitcoin is like the tulip market. Is this correct?**

This is may be the silliest comparison that has been made in recent history, but it is understandable. Bitcoin gained such demand and traction in such a short period of time and that, coupled with the mathematically limited supply, created an overvaluation and correction that could appear on its surface as a bubble. However, if you really dig deeper into the history of the monetary system, especially the gold standard and the eventual departure from the gold standard to money by decree, that is fiat money and you will begin to understand the implications of bitcoin. Bitcoin is the fiat of the people, meaning adoption is the de facto decree free from any government manipulation, censorship or inflation.

**While you were founded in 2016, you seem to be taking the market by storm and already have offices in New York, Hong Kong, Russia and Singapore.**

We believe BANKEX will help transform the financial markets around the world and we need to be in those key markets.

**How do you envision blockchain changing the financial markets over the next five years?**

Blockchain is ushering in a new era of decentralized financial markets. The entire ecosystem is designed around cryptography and game theory allowing trustless interactions between counterparties. As an example of what this means is that instead of trusting that banks securitizing bundles of mortgages are following proper risk and financial analyses, which they obviously weren’t pre-financial crisis, we can create smart transparent digital assets that investors and borrowers interact with directly on the blockchain.

Let’s switch gears and talk about how you came to this point. You were born in the Ukraine and you actually have four master’s degrees in Physics, Economics, Journalism and an MBA from Stanford University. Tell us your story.

I was born in a small city in the Ukraine with a population of roughly 30,000 people. I was drawn to math and physics when I was young and my mother was a teacher of language and theology. That sort of background is largely the reason why I oriented myself toward both mathematics and journalism. You have to understand that in the ex-Soviet Union, you’re forbidden to study two different disciplines.

**“Bitcoin is the fiat of the people, meaning adoption is the de facto decree free from any government manipulation, censorship or inflation.”**
Igor Khmel  
Founder & CEO BANKEX

“Instead of trusting that banks securitizing bundles of mortgages are following proper risk and financial analyses, which they obviously weren’t pre-financial crisis, we can create smart transparent digital assets that investors and borrowers interact with directly on the blockchain.”

disciplines at the same time; it is not allowed. I wanted to study multiple tracks so my work around was enroll in different universities in order to have studies in physics at one university and studies in literature at another. After getting my master’s degrees in physics, economics and journalism in Russia and the Ukraine, I came to America and got my master’s degree in business from Stanford University. This type of varied background provided me with good groundwork, not to mention a diverse perspective.

Where did the idea for BANKEX come from?

To be honest, it arose directly from the background I just described. As a former head of innovation for one of the leading banks in Eastern Europe, I had the privilege of serving as a judge for the main innovation competition, based in Amsterdam, which included the most forward thinking banks in Europe. All of the innovation companies competing were there as well and, of course, several judges from around the world. As one of the judges, I was there to basically select who had the best innovation. At the competition, I saw the inside of this concept, I could visualize the potential and I knew this was something very transformative, something that I had to spearhead. I left the bank shortly thereafter and, of course, set about to build a business which closely modeled this concept.

We talked about the bitcoin and the token. Token sales means that you’ve created this thing that has a history and it represents currency, correct?

Correct, there is a significant amount of attention being paid to the science underpinning token sales right now. It’s an exciting time to say the least. As for the tokens, there are actually two primary types: there are security tokens and then, on the other hand, utility or commodity token or currency. We’ve created token sales for the currency to be used by financial organizations in order to talk to each other, in order to exchange values, or assets. In point of fact, those organizations have already begun to use this currency right now in order to exchange assets which have been since been proven by BANKEX. We’re off to a good start that.

Can you give an example of that?

Of course, for example we have a notable proof of concept with a major Japanese bank and have created unique tokens that are set to launch shortly. On a similar note, we’re launching a series of tokens in Hong Kong which are associated with the platinum inventory of a major global mining operation. The process goes something like this, the miner extracts platinum from iron ore and they send it to a refinery. In the refinery, they increase the quality of platinum, so it develops into real platinum. Next, we have banks that control this platinum, and they can guarantee that there is a value of platinum there, behind our digital token. When the people trade, it’s back and forth, and they know that there is a trustworthy institution, BANKEX, there maintaining that platinum reserve.

Similar to a gold reserve, there is a platinum reserve?

Yes, strikingly similar in fact. Blockchain, as most know by now, is the centralized database for bitcoin. It’s the way to record and validate data in many places altogether, that is why it is written correctly for many places. No one is able to alter our program and, because it is validated, it is dependable as it’s also written in many other places on computers. This is the power and trust of blockchain. Blockchain builds the trust between people.

Can you give me a specific example of how bitcoin and blockchain can have a positive impact on an industry?

Absolutely, since this past year we have been working on “MovieCoin,” which, to date, is the biggest asset class that we are building as a bank. It is a transformational entertainment industry financing fund that will provide investors with an unprecedented opportunity to invest
in Hollywood films, television programs and other strategic assets using a blockchain-based financing platform and cryptographic tokens that will dramatically increase stakeholder transparency and significantly improve industry accounting and payment practices.

Traditionally, film projects are financed either on a one-off basis using bank loans secured by tax credits, government subsidies, pre-sales on distribution rights, and/or discounted value of future territorial rights sales, or via studio “slate” financing arrangements with investors relying on box office performance to generate a return. The latter investor group includes hedge funds, private equity firms, sovereign wealth funds and high net worth individuals.

Now, through the issuance of digital tokens created on our blockchain platform that denominate and transfer value, MovieCoin is democratizing this process to make investment in movies, television shows and other media projects across the $2tn/year global entertainment industry more accessible for institutions and individuals outside of the Hollywood bubble.

What do you mean by an asset class?

We named them asset class or asset vertical. It’s a currency for Hollywood. In Hollywood, like in many industries, film makers are famous for creating their own ecosystem, and what a complex ecosystem there is in Hollywood! They have talents, they have guilds that represent talents, they have production studios, they have sales agents, they have staff who support and help them, they have screenwriters. All of these people cooperate with each other and they have a lot of agreements so they create packages. It’s hundreds or thousands of pages – all the contracts that you need to sign before the movie is done. You have to ensure the budget; it’s very complex. That’s why they have complex relationships, and they struggle at times, especially the actors. They see talents get paid on time as agreed or they see that the movie made triple the amount of money, but they get just 10%. They don’t understand why or what’s going on. There is even the term “Hollywood accounting” because of just that. We are solving this problem and helping the industry to become more transparent for everyone who, of course, works in the movie industry but also for newcomers and for external investors who want to invest in this industry and may be afraid that they will just be losing money.

It’s all been well accepted. We just participated in the Cannes Film Festival where we presented MovieCoin and it was well received by the press as well as the various communities of employers and employees. People in the industry have heard about MovieCoin and they liked the concept of transparency. To facilitate the development of MovieCoin, I created a company that is in the business of audit and collection within the film industry. The company has already audited 4,000 movies for the history of the contracts and agreements associated with each movie. People in all facets of the industry like the idea that

“Blockchain builds the trust between people.”
somebody can automate and make a complex process smoother. Basically, this helps everyone from investors to producers, directors, actors, behind the scenes people, to grow their business. We’re happy to be part of the solution process.

If it works in the movie industry, wouldn’t it make sense that it would work in other industries where there might be a lack of transparency?

Of course. This is why blockchain will be an ongoing evolution. It has made tremendous strides already within the financial industry and, similarly, in many industries where there is a complex supply chain. There is a particular case with IBM where this is well demonstrated. In short, they created a food portal where you can track the food that you bought from Whole Foods or Walmart or Safeway. You are able to check where it was produced, what factory it went through and the quality of that factory but also if that factory uses child labor. Blockchain technology that is behind bitcoin is like a friend you trust that you support with your money. They are the good guys, not the bad guys and all these things can be proven by blockchain.

You were also involved in doing some things that are non-profit. As an example, BANKEX is involved with The Symphony Software Foundation.

Yes, we joined about one year ago with Symphony Foundation, which is the foundation for top New York banks. It’s a professional community, and they are joined together to do something similar which is to open sources using software to talk to each other. This is something similar to Bloomberg. Right now, this foundation has become more than that. It’s become FinTech Open Source Foundation, so it’s building open source software for banks. The foundation’s partners are corporate institutions and some hedge funds. We want to sell the concept of this non-profit organization to banks, however the banks are the most traditional institutions and they are slow to come into this industry. This is the final destination and that’s why we’re working on that.

Here is a big question for you: How can CEOs utilize blockchain to enhance their corporate finance?

CEOs are the strategy and vision drivers for every organization. Innovative companies that will be the leaders in their respective markets are always driven to win from the top down. CEOs need to find firms to partner with those who understand both financial markets and products that use blockchain and smart contract technologies. The time to do this is right now. The reason the most widely-traded products find market equilibrium is by the wide dispersion among competing investors and buyers. What this means for corporate finance is that mergers, acquisitions, and debt and equity capital funding will become cheaper, faster and more efficient as these processes start to incorporate decentralized fund-
We hear the terms “securitization” and “tokenization.” Why is tokenization better than securitization?

Tokenization is a kind of another life for securitization. It’s securitization that leverages blockchain and technology and this brings to the table two main advantages, one of which is it’s decreasing the cost of securitization. It requires a lot of legal lawyer efforts, trustees and payment agents. In every securitization, there are actually eight different companies in the world, and all of them should be paid. It’s a lot of paperwork being done. That’s why you need the volume to increase the cost.

The second one is working with the decentralized assets. You can walk with the asset distributed, you don’t have to be in one place. You are at the same time decreasing the cost. You have decentralized assets, and all together, it means that you can make a tokenization of much more assets than right now. You don’t need all of them to be in one bank with expensive lawyers.

If you look forward at our global monetary system, what do you envision it will look like in 2050?

By 2050, we will have fully decentralized capital markets. Banks will be more analogous to market-makers connecting savers and borrowers in a more decentralized manner. We can already see this occurring in the retail credit market where crowd-sourcing is allowing individual investors to collaborate with one another and provide loans directly to borrowers to earn a return on their capital. Globalized and fungible crypto currencies will become widely adopted as the full breadth of financial product opportunities is realized; this includes everything from liquid commodities and physical goods trading to non-fungible rare goods being tracked from inception and in real-time for quality and ownership.

It’s been a pleasure having you on The CEO Forum.

Thank you, Bill.
Three plus years ago, in this same space, I offered my thoughts on technology and directors entitled Technology is the New Black. Essentially, I forecasted that directors would need to have up-to-date, conversational knowledge about current and emerging technologies, particularly those that could affect their companies, in order to competently perform their board responsibilities. I meant this as a wakeup call. Based on subsequent conversations with readers, many directors took my advice. Some challenged it, others simply discounted or ignored it. Back then, I saw that for many directors this event horizon appeared to be coming within 5-7 years. I was wrong: as of right now, that ship has already sailed out a lot further. If you didn’t start to catch up back then, you might never be able to now. My question now for those directors is: How long can you tread water?

Think about this: some major technological breakthroughs and evolutions, with serious implications for business, have already occurred. Since 2014, driverless vehicles, advanced genetic engineering and immunotherapy, machine learning, 3D metal printing, cryptocurrencies, and the digital enabling transaction technology Blockchain, have all blossomed with increasing promise, and some new and significant controversies. Just these few will disrupt current business practices and older technologies, but more concerning is that they will also affect less obvious industries and aspects of daily living including politics, insurance, the environment, transportation, global communications, and likely everything else. These technologies may also spawn others that will disrupt and supplant them in turn. So, yes, the ship is sailing and picking up speed.

Referring back to the aforementioned article, I posited that directors needed to, in the very near future, become technoliterate, just as they should have, by then, become financially literate. (By the way, if you’re not financially literate by now, your opinions are pretty much irrelevant in major board discussions). The one difference between those literacies was that becoming conversant in current industry-affecting technologies required not just catching up with but staying abreast of the changing landscape.

I also implied that directors needed to be adept with the business tools commonly used by the company’s employees, management, vendors, and customers. Back then, I mentioned, with some amusement, that I knew directors who still didn’t use email, laptops, and other tools provided to them. Today, I know very few professionals who would find that amusing. It seems tolerance for the irrelevant has dropped off at the same pace as having “spare time” to do what you want.

So, do you suspect that you’re techno-irrelevant already? Here’s a check. Ask yourself these questions: Are most of my communications done by email or text? Can I use and easily navigate around PCs, laptops, tablets and smartphones? Can I quickly research people, places, concepts, business information, and company news and views through the internet, business databases, and social media? Am I doing more of this on my phone than on a computer? Have I kept my assistants (who do things I don’t have time to do) from becoming my aides (who do things I don’t know how to do)? If you said no to any one of these, you are falling behind. More than one? Sorry to tell you: you’re pretty much techno-irrelevant, and likely
to become board-irrelevant. Treading water won’t keep you afloat for long.

What about those of you with all “yes” answers? Congratulations, but don’t think you can rest on your laurels. Even if you can speak glibly on current and emerging technology concepts, and can even describe how they work and can affect your business, it’s not going to be enough. You need to see out beyond these innovations and speculate on their domino effects on less obvious areas like societies, international and domestic relations, intergenerational workforce dynamics, politics, environment, laws, regulations, and economies, to name a few. You will also need to anticipate how other forces can kill or crimp off promising technological revolutions before your company sinks precious funds into them.

As an example, you should be ruminating over some of the following: After a few more pedestrian deaths from driverless vehicles, will societal and political pressures put developing commercial fleets on hold? Will privacy and airspace security pushbacks prevent drone commerce from ever getting off the ground? Will new risk concerns make insurance premiums and required guarantees too high to introduce new products profitably? With healthcare advances and longer lifespans, what will the future workforce look like? Will the use of cryptocurrency for everyday trade die on the vine because some large countries/economies have fully or partially banned their trading?

So here’s the upshot: if you are techno-irrelevant you need to do some heavy lifting – now. It will be uncomfortable, but not unachievable. The inconvenient truth, however, is that competent board work is not comfortable: it is getting more complex, more demanding, and more time-consuming. It’s no longer enough just to read the board materials, show up to meetings four to six times a year, and expect others to think you’re worth your compensation. I’ve said this through many writings: the best corporate directors are eager and active learners. These can be the best of times or the worst of times, depending on how willing you are to face things head-on.

Or…you can just forget about all of this, cross your fingers or draw on your charismatic skills or call in some favors in the hope that you can stick around for a while longer. The ignorance of your peer board members may shelter you, at least until your more savvy investors and shareholders catch on and start to tighten the screws.

**Bottom line:** if you already are or are becoming techno-iliterate, you will become both techno- and board-irrelevant. If you don’t understand what’s being discussed at the table, how can you expect your opinion to be valued? If management looks to its directors for guidance and inspiration, and you’re not even keeping up with them, don’t expect to be valued. A director’s irrelevancy hurts everyone: it kills your future, cuts the board’s composite strength, and wastes resources and opportunities for the company. Irrelevancy can be a real bitch, don’t cha think?

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**Nancy May, President and CEO of The BoardBench Companies, has been cited in Forbes as one of America’s governance experts. She has over 25 years’ experience as a strategic advisor to high-growth, mid-cap, and Global 100 public and private companies. BoardBench is a corporate governance, director and CEO succession, and board candidate advisory firm.**

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"When you think about how Topgolf started with the microchipped balls, we have been a digital-first company since day one. Technology plays an integral role in our guests’ and fans’ experience."

Robert Reiss: Topgolf is like no other organization I know of in the entire world. As a matter of fact, this may come as a surprise to you, that when we set up our CEO interviews around the United States the first question that members of my team and I will ask: “Is there a Topgolf near where we are going?” Talk about what Topgolf is.

Erik Anderson: Topgolf is a global sports and entertainment community creating great times for all. It all started when we set out to make golf more fun and engaging by putting RFID chips in our golf balls to track the accuracy and distance of players’ shots. Players then aim for giant targets on the outfield and can play a variety of point-scoring games. Our sports entertainment venues were the first expression of the Topgolf brand. A typical venue is three levels and 65,000 square feet, featuring games, food, drinks, music, HDTVs and outstanding hospitality by our Associates. Our venues have become a gathering place for the community to host corporate meetings, birthday parties, bachelor and bachelorette parties and a variety of other celebrations. It’s a place where anyone can have a good time – even if you
“Our tagline is that Topgolf is Everyone’s Game. Every day, we are helping people experience golf for the very first time. If you walk down our tee line at any given moment, you’ll see people of all ages, backgrounds and abilities. Of course, we also appeal to golfers too. Marc Leishman, who this year is a top 10 golfer in the world, was asked after a tournament how he had been practicing, and he’d been playing at Topgolf.”

are a non-golfer. In recent years, the Topgolf brand has evolved to offer interactive experiences outside of our venues. Now you can play Topgolf 24/7 on your phone via our WGT Golf app. You can hit golf balls from the grandstands of your favorite sports stadiums with Topgolf Crush. You can visit a Topgolf Swing Suite to have a more intimate lounge experience inside hotels, casinos and even fitness centers. You can watch Topgolf TV featuring our original shows, and you can also see our Toptracer technology in major tournament broadcasts on primetime television. Last year, we also began licensing our Toptracer technology to driving ranges around the world. Topgolf will continue to evolve how and where people enjoy the game of golf.

When you go to the venues, you don’t have to be a great golfer, it’s more about the experience.

Yes, our tagline is that Topgolf is Everyone’s Game. Every day, we are helping people experience golf for the very first time. If you walk down our tee line at any given moment, you’ll see people of all ages, backgrounds and abilities. At Topgolf, you can wear what you want, cheer as loudly as you want and play for as long as you like. Of course, we also appeal to golfers too. Marc Leishman, who this year is a top 10 golfer in the world, was asked after a tournament how he had been practicing, and he’d been playing at Topgolf.

Pete Bevacqua, the CEO of The PGA of America, was telling me that the PGA wants to bring more people to the game. It seems to me Topgolf is doing that.

Topgolf is introducing more people to the game of golf on a daily basis than perhaps any other concept. It’s a very authentic golf experience because players hit real golf balls with real clubs, yet the environment is very fun and non-intimidating for new players. A 2017 survey of Topgolf guests by the National Golf Foundation revealed that 53 percent of non-golfers say that playing Topgolf has positively influenced their interest in playing traditional golf. Twenty-three percent of the new golfers surveyed who have been playing for less than three years started playing golf after their first Topgolf experience. The survey also showed us that people are watching more golf after playing at Topgolf. Our philosophy is that what is good for golf is good for Topgolf, and vice versa, so we are proud to support the industry however we can. We have strong partnerships in the PGA of America, PGA TOUR and the LPGA.

Right now there are about 41 different locations, 38 in the United States. Describe the technology you’ve created to make Topgolf possible.

Yes, we currently have 41 venues open worldwide. There are two core technologies that power our game experience. The original technology is the microchipped golf balls that provide instant feedback on how many points a player has scored and the distance of their shot. In 2016, we acquired Protracer, renamed Toptracer, which is a technology that tracks the actual flight path of a golf ball, including speed, height, carry, curve, etc. This technology is used on televised golf tournaments, at our Topgolf Crush events and is being added to our venues for an enhanced player experience.

Let’s talk about how you are using digital to transform golf as an industry.

“In 2016, we acquired Protracer, renamed Toptracer, which is a technology that tracks the actual flight path of a golf ball, including speed, height, carry, curve, etc. This technology is used on televised golf tournaments, at our Topgolf Crush events and is being added to our venues for an enhanced player experience.”
When you think about how Topgolf started with the microchipped balls, we have been a digital-first company since day one. Technology plays an integral role in our guests’ and fans’ experience. Technology is always advancing, and so is the Topgolf experience. WGT Golf, which we acquired in 2016, is the world’s most popular digital golf game. Players can enjoy a Topgolf experience on the WGT Golf app and compete against other golf enthusiasts from around the world. We are using our Toptracer technology in our venues, on televised golf broadcasts, at Topgolf Crush events and to license to driving ranges worldwide. Our Topgolf Swing Suite locations use Full Swing golf simulators that feature a Topgolf game. We also have Topgolf TV in our venues that feature our original content shows, some of which are also available on Amazon Prime. Whether or not you live near a Topgolf venue, you can still experience the Topgolf brand in many other forms.

Talk about Topgolf’s early days.

The company set out to make golf more fun and engaging. We have evolved to connect people in meaningful ways and create moments that matter in their lives. We began with a very simple food menu and now have Executive Chefs in all of our venues and a kitchen staff of 75 who are prepping and cooking food nearly 24/7. Topgolf in the early days required players to get a bucket of balls, and now we have in-bay ball dispensers. We also have created dynamic private event spaces for corporate and social events. Music has become a key part of the Topgolf experience throughout the years as well. There have been a lot of people who have been an important part of building Topgolf – the founding twin brothers, Steve and Dave Jolliffe, along with Richard Grogan, who is our first Chairman and CEO and who introduced me to the company when we were the first investors. A lot of talented people have built this company that now touches millions of lives every year.

Let’s walk through the history of Topgolf.

The founding brothers were competitive and would try to see which one of them hit the ball the farthest and the closest to the hole when they played golf together. They had the idea of putting a microchip in a ball. The first ball prototype included a chip from a dog caller that they took to a local police station to be scanned. When the prototype worked, they knew they were on to something. They had the opportunity to open the first venue outside of London in 2000.

Then in 2004, you came in as an investor. What peaked your interest as a private equity person?

We’d seen the results in the U.K., which looked good, and Richard Grogan, who is a strong business leader, also brought me another person, Tom Mandel from Goldman Sachs. When I looked at it, they said, “We could replicate this.” We were familiar with some of the bowling alley trends, so we thought this was something similar where you could replicate the economics.

Talk about your experience of taking something from an idea that was working in a smaller sense to something that became more ubiquitous.

The original concept was golf-focused, nicknamed Target-Oriented Practice (Top) Golf. We had golf retail, we had a smaller kitchen and it was a “golfy” vibe. There wasn’t a lot of digital signage or TVs as we were focused on the game. This version of Topgolf was still quite successful, but we started thinking we could be more.

The first transformation involved making the venue larger, with much bigger kitchens, and adding private event space. Over time, we evolved our retail business from being very golf equipment-oriented to offering trendy apparel and Topgolf gear. A business meeting with an executive from Red Bull Media got me thinking that we had the ability to develop our own original content and experiences outside of the four walls of a venue because we already had such a captive audience. This realization led to our acquisitions of WGT Golf and Protracer. We built an aggregation of talent, assets and technology that are allowing us to take the brand and the experience anywhere in the world.

Where’s the potential of the media business?

Topgolf Media now has the world’s largest digital golf audience and an audience that is highly engaged. We’re building content that brings our purpose to life. Our shows include: a cooking competition show, Chef Show-
“Topgolf Media now has the world’s largest digital golf audience and an audience that is highly engaged.”

down; a music competition show, Who Will Rock You?; a Topgolf competition show, Shotmakers, which aired on Golf Channel this summer; The Hook featuring Lady Antebellum’s Charles Kelley; Topgolf Tour, which tells the stories of the world’s best Topgolf players competing for a chance to win $50,000; and In Focus, which showcases the inspiring stories of our Topgolf guests, associates and communities. Some of our content is now available on Amazon Prime, and we look forward to expanding our content distribution to other popular platforms in the future. Our Topgolf Media business is also focused on creating strategic partnerships, which serve to enhance our guest experience. We look forward to many more successful partnerships in the future.

You’re building a whole community.

Yes, Topgolf is global community that is fan-oriented and designed to connect people in meaningful ways and create moments that matter both big and small.

Let’s talk about the word “transformation.” What do you see as the core characteristics for a CEO to have to lead a successful transformation?

For me, it’s curiosity. Deep curiosity is really important. You have to figure out what’s happening and why. Courage is a necessity too. If I look at some other good leaders, I think of Ron Shaich from Panera, for example, and he’s on a great thing. He’ll tell you about how he had to transform his business.

He’s an amazing guy. You know, if you invested $1,000 on 1997, it’s worth $9.8 million today.

Ron talks a lot about courage. You also have to be agile, which means as you see what’s happening, you have to be able to pivot pretty quickly on the fly. The market is rapidly changing – exponentially changing – all the things we’re aware of, especially in the entertainment world.

If you had a mulligan in business, what was it?

I would have had built some bigger venues. We have our flagship venue in Las Vegas, which has been transformational to our brand. That venue has two pools, and we
found that if we can create bigger and more engaging experiences, it keeps our guests captivated. We are going to do some more of those things. I also would have defined our culture and purpose even sooner as we take great pride in our values. For entrepreneurs, define your purpose and culture early, and don’t waver from them – use them as your guide in making all decisions large and small.

**How do you partner with other CEOs?**

I am all about big ideas. When partnering with other CEOs I like to create partnerships and alignment between brands. How can we innovate together? My vision is the end game and I believe to be successful you need to see an aspirational value proposition. I look for something that can make a difference and is important over time. I call it the Strategic Arc. Focusing on intellect, integrity and always bringing my best thinking into a conversation is important to me and crucial to building these relationships.

“For entrepreneurs, define your purpose and get your culture early and don’t waver from them.”

Erik Anderson is a leader in global innovation. He is the Founder and Chief Executive Officer of WestRiver Group (WRG) since 2002. WRG is a collaboration of leading investment firms providing integrated capital solutions to the global innovation economy. In 2018, Anderson became Chairman of Singularity University, a global community using exponential technologies to tackle the world’s biggest challenges. Anderson is also the Executive Chairman of Topgolf Entertainment Group. In this role, he has received numerous honors, including the Ernst & Young Entrepreneur of the Year Award. In 2017, he was honored by Goldman Sachs as one of their Top 100 Most Intriguing Entrepreneurs and ranked by Golf Inc. as the No. 8 most powerful person in golf. Anderson is Vice-Chairman of ONEHOPE, a cause-centric consumer brand and technology company, most commonly known for their award-winning wine and world-class vineyard in Napa, Calif. In addition, he is on the Board of Avista Corp (NYSE:AVA), an energy management company, and serves as Chairman of the Finance Committee. His investment experience includes being Partner at Frazier Healthcare Partners, CEO of Matthew G Norton Co. and Vice President at Goldman, Sachs & Co. Anderson was recognized early in his career as one of the top “40 under 40” young achievers and emerging leaders by Seattle’s Puget Sound Business Journal.
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Manchester United has perhaps the most ardent fans of any sports franchise in the world. Just one example: The team’s supporters are the loudest among England’s top soccer teams, according to a recent study. The excitement during a match at Manchester’s legendary Old Trafford stadium is palpable.

But the focus of Manchester United’s engagement with its 650 million supporters worldwide – most of whom will never attend a game – is shifting. The fan experience is expanding beyond the foot-stomping, chant-repeating confines of Old Trafford to the online world, which creates an opportunity to broaden and deepen the team’s engagement with its avid supporters.

Manchester United wants to make fans’ digital experience on their mobile phones and other devices as adrenalin-pumping as the in-stadium experience. By generating content tailored to fans’ different geographies and personas, and offering direct interactions with the team’s stars, the team is creating an immersive virtual experience during and in-between matches.

Wind, Courage and Bandwidth
The Volvo Ocean Race is one of the most grueling competitions in all of sport. Instead of competing for 90 minutes before a stadium full of cheering fans, these advanced boats circle the globe in often brutal conditions, with brave crews working around the clock for 28 days at a time in some of the most remote and inhospitable waters anywhere.

Digital technology plays a big part in the race – for example, in helping boats avoid the icebergs that are adrift in areas south of normal shipping lanes, where the vessels head to catch the strongest winds. But technology also helps create fan engagement, allowing the onshore race audience to experience what crew members are going through on board in this hostile environment.

The boats are equipped with an array of microphones and cameras that allow crew members to recount to the race audience human stories of their experiences and overcoming challenges in real time. Each boat has two drones, which provide live aerial footage from the middle of the ocean.
Big data analysis of the content generated by the boats can identify communities of interest among consumers. During the last race, analysis of social media revealed that school teachers were using race content to teach geography in their classrooms. This led to the creation of content packages specifically designed for this community of school users, as well as the opportunity for students to have a live Q&A session with crew members at the end of the race.

Fan Experience, Customer Experience

The use of digital technology to enhance the fan experience is in many ways similar to the ways in which companies are digitally transforming the customer experience. But unlike the passionate fans of Manchester United and the Volvo Ocean Race, most companies’ customers are still on the way to becoming fanatics about their products or services.

CEOs across industries should be asking themselves: How can my company – which operates far from the roar of the crowd at a soccer stadium or the adventure of competition on the high seas – use digital technology to turn our customers into fans?

HCL Technologies is the official technology partner of both Manchester United and the Volvo Ocean Race, and here are some lessons on creating digital fan engagement that I have drawn from those two organizations’ initiatives:

Create persona-specific content. One way that digital technology can turn customers into engaged fans is to personalize content, then package and deliver it in just the way that a category of customer prefers.

Offer a behind-the-scenes view. The intimate look that digital technology provides of life aboard a Volvo Ocean Race vessel at sea fosters fan engagement because it takes you to a place you would otherwise never go. Businesses have a similar opportunity to provide an intimate insider’s view of some aspect of their operation.

Enable interaction with “stars.” Direct interaction with important people in an organization, whether a star midfielder or a racing boat captain, or a CEO or team expert, can turn a passive customer into an active fan.

Cast a wide net. Fans may not always be direct consumers of a product or service. Like the Manchester United fan from Asia who may never see a game at Old Trafford, an aspirational customer of a luxury product can still be a valuable member of a fan community.

The Power of Fans

Fans make great customers. They are loyal. They are passionate and extremely knowledgeable about a product. They are effective social-media brand ambassadors.

As CEOs lead the digital transformations of their organizations, they should be pressing their technology and marketing CxOs to identify ways to leverage digital technology to transform customers into “fans” of the company and its products.

Whether you’re a world-class soccer team, large enterprise or a small family business, having customers who are fans – who have a positive emotional connection with your company and product – is one of the most important factors in making your company a winner.

Arthur Filip, Chief of Sales Transformation and Marketing, HCL Technologies

Arthur Filip is the Chief Executive of Sales Transformation & Marketing at HCL Technologies, an $8B global technology company. Arthur’s role is to oversee customer relationships, sales excellence & operations and initiate transformational activities. He also leads all marketing functions including global business, strategic marketing, sales enablement, and corporate communications.
“One of my favorite quotes on learning is from Julia Child, ‘You’ll never know everything about anything, especially something you love.’ My love has been learning about business models and success, where I have read over 1,000 business books; following are three of those which I believe can be of great value to today’s top CEO.”

**How I Retired Successfully and Happily and Lived to be 100 by Ira Neimark**

When writing this memoir, I wanted to tell the story of how fortunate I have been to be successfully and happily retired, and to pass on this experience and advice on to others, including what my priorities were to achieve a successful retirement. My editors recommended that I include an outline of my family and an autobiography of my early years, leading up to my becoming the CEO of Bergdorf Goodman. This would give the readers of this memoir a sense of the ingredients that helped me to reach that point. They further recommended that I include many of the newspaper clippings that chronicled Bergdorf Goodman’s and my climb to success. In any case, it is a lifelong story that may be helpful to those who take the time to read what it is that I have written. “In a digital world, I thought this book is so inspirational sharing what life is really about” Robert Reiss

**Virtually Human: The Promise—and the Peril—of Digital Immortality**

by Martine Rothblatt PhD

Virtually Human explores what the not-too-distant future will look like when cyberconsciousness—simulation of the human brain via software and computer technology—becomes part of our daily lives. Meet Bina48, the world’s most sentient robot, commissioned by Martine Rothblatt and created by Hanson Robotics. Bina48 is a nascent Mindclone of Martine’s wife that can engage in conversation, answer questions, and even have spontaneous thoughts that are derived from multimedia data in a Mindfile created by the real Bina. Virtually Human is the only book to examine the ethical issues relating to cyberconsciousness and Rothblatt, with a Ph.D. in medical ethics, is uniquely qualified to lead the dialogue.

**Moonshot! by John Sculley**

“The future belongs to those who see the possibilities before they become obvious… This is the most exciting time ever to be part of the business world.” Throughout history, there are some events that stand out as so groundbreaking that they completely change life as we know it. The Apollo moon landing of 1961 was one of those events—the invention of the Apple personal computer was another. In this book, John Sculley—former CEO of both Pepsi and Apple—claims we are in an era that is giving birth to numerous groundbreaking events and inventions—moonshots—that will change the way we live and work for generations to come. The time is ripe, according to Sculley, for a new breed of innovative entrepreneurs to build businesses across industries that will bring in billions of dollars—while changing people’s lives for the better. And in this book, he’ll show you how to do it. Moonshot! lays out a roadmap for building a truly transformative business, beginning with a can’t-fail concept and drawing on clear examples from companies who’ve done innovation right.
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