

# Top Strategic Predictions for 2017 and Beyond: Surviving the Storm Winds of Digital Disruption

**Published:** 14 October 2016

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Digital business innovation creates disruptive effects that have a wide-ranging impact on people and technology. However, secondary ripple effects will often prove to be more disruptive than the original disruption. Digital strategists must actively identify secondary effects when planning change.

## Key Findings

- Digital experience and engagement will draw people into nonstop virtual interactions.
- Business innovation will create extraordinary change from mundane concepts.
- Secondary effects will often be more disruptive than the initial digital change.

## Recommendations

Digital strategists:

- Adopt conversational user experience (UX), bots and artificial intelligence (AI) as new ways of engaging customers in a more computer-enhanced style of interaction.
- Learn best practices from the "digital giants" to see how they use commonplace technology concepts, such as search and marketing, to advance disruption across industries.
- Look specifically for secondary effects from opening up data or from using new technologies that will change the way people behave or which processes are still needed in a business.

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Strategic Planning Assumptions

- By 2020, 100 million consumers will shop in augmented reality.
- By 2020, 30% of web browsing sessions will be done without a screen.
- By 2019, 20% of brands will abandon their mobile apps.
- By 2020, algorithms will positively alter the behavior of over 1 billion global workers.
- By 2022, a blockchain-based business will be worth \$10 billion.
- By 2021, 20% of all activities an individual engages in will involve at least one of the top-seven digital giants.
- Through 2019, every \$1 enterprises invest in innovation will require an additional \$7 in core execution.
- Through 2020, the Internet of Things (IoT) will increase data center storage demand by less than 3%.
- By 2022, IoT will save consumers and businesses \$1 trillion a year in maintenance, services and consumables.
- By 2020, 40% of employees can cut their healthcare costs by wearing a fitness tracker.

Analysis

What You Need to Know

Gartner's top predictions for 2017 and beyond examine three fundamental effects of continued digital innovation: experience and engagement, business innovation, and the secondary effects that result from increased digital capabilities. These predictions help our clients understand not only the

radical changes they face in the digital world, but also the outcomes that will reshape the very ways in which we value what we do and the nature of future IT investments.

- Use Gartner's predictions as planning assumptions on which to base your strategic plans.
- Evaluate the near-term flags that indicate whether a prediction is trending toward truth or away from it.
- Position predictions with longer time horizons as having a lower probability of coming true than those with shorter time horizons.

At the core of future outcomes is the notion of digital disruption. Disruption has moved from an infrequent inconvenience to a consistent stream of change that is redefining markets and entire industries. Last year, we said that digital changes were coming fast. The growth of IoT and smart machines was supported by predictions that massive numbers of devices and robots would soon enter mainstream markets. And this year, the acceleration continues, but it shows strong signs of leading to some secondary effects that may not be as well-anticipated. An example is the astonishing rise of Pokemon Go by little more than word of mouth — and the emergence of new marketing schemes based on augmented reality (AR) and virtual IoT "things." Pokemon Go's virtual internet monsters encourage us to look for unanticipated consequences of the rise of IoT. Also, we also note that, by 2020, half of large enterprises will be making business-critical decisions using discredited information. This is another unintended consequence of the pace of change being so high. With little ability to audit sufficiently the collection, distribution and vetting of data, it is inevitable that some discredited research or information will be consumed faster than our ability to recognize it as outdated, irrelevant or inaccurate.

But lest we feel disruption is only a negative effect, we should examine how even negative disruption can lead to positive change. By 2022, IoT-enabled service models could save a trillion dollars a year in maintenance and service costs. This prediction aligns with the idea that, with such a large number of devices (\$2.5 million per minute in IoT spending and 1 million new IoT devices sold every hour by 2021), we can only expect that those devices and connections will create new ways to make money.

Digital innovation can often be a very risky and not particularly rewarding endeavor — it requires investments that more often fail to pay off, while generating huge risks for the company. Those seeking to capitalize on the risk must take note that the technologies we speak about carry different kinds of business value. Some will support companies gaining a temporary competitive advantage, while others have the potential to create new markets. The practical approach for action, then, is to recognize disruption, to prioritize the impacts of that disruption, and then to react to disruption in order to capture value.

Among the high-level trends that emerge from these predictions are:

- **Digital experience and engagement will draw people into nonstop virtual interactions.**

By 2020, the average person will have more conversations with bots than with their spouse. Make no mistake, our interactions with technology are growing rapidly. The use of bots is encroaching on our lives due to the rise of AI and conversational user interfaces. Whether

through voice interaction or textual input, we are increasingly likely to have interacted with a bot (and not know it) than ever before. The digital experience is addictive. It enters our lives through smartphones, tablets, virtual personal assistants (VPAs) or even the entertainment systems in our cars. And beyond that, the interactions with others through video doorbells, video watch applications and even our everyday gaming systems add to the deluge of virtual interaction mechanisms invading our world.

But the advantage of digital interaction is that it is flexible and on-demand. At any time, we can have an interaction in multiple digital environments. This leads to a lower-friction path to value. Controlling a drone remotely or getting work advice from a smart machine is becoming more of a normal activity. Our ability to handle high volumes of virtual interactions may well increase our ability to multitask, but it will certainly mean the death of one central channel for interaction, instead morphing into multibrand, multi-interface, multiecosystem processes with the rise of brokers.

- **Business innovation will create extraordinary change from mundane concepts.**

Can true innovation arise from more mundane concepts? This is a question that should be asked by every CIO, chief digital officer or digital strategist. The answer will prove to be yes. Examples are already appearing in some more trendy areas of technology and business. For example, conversations about blockchain are hard to avoid as the technology is credited with being ready to impact everything from financial transactions, to money, to community information exchanges. The reality is that blockchain is based on more mundane concepts of sharing, distribution and data visibility. However, its ultimate impact will be broad and far-reaching, much farther than the technologies of its roots have been to date. For example, the use of blockchain as a potential way to increase the reliability of transactions and the visibility of the same while maintaining the privacy of transactions will allow ecosystems of partners to interact with more freedom and diversity than ever before.

Second, let's examine the rise of the digital giants, such as Facebook, Google, Apple and Amazon. These companies are shifting the dynamics of how people purchase things, where they go for information and indeed how they make some of the more critical decisions in their lives. Little is more common than the act of purchasing items for our own benefit. And yet, the use of conversational user interfaces, such as Amazon's Alexa, to buy items or to give us daily briefings begins to alter the very lifestyles of people day to day. Within the business community, Google has already revolutionized how we categorize and retrieve information or market ourselves. But few would have thought 10 years ago that Google would revolutionize transportation, and yet the Google car has many businesses asking themselves what the future of their car fleets might be. And even in education, we find that we have altered what it means to be literate. In the past, those who could read extensively were considered literate. Now, it is those who can search. The mundane nature of search has risen to be the foundation of information discovery and research today.

- **Secondary effects will be more disruptive than the initial digital change.**

Secondary effects — Here is where the value of outcomes cannot be overlooked. We are all familiar with the notion that action leads to reaction. But in digital change, action leads often to an exponential growth in reactions. Disruptions cause ripples of change to radiate out and to

change other areas. As we see an increase in disruptions, we will see a corresponding increase on secondary effects. Choosing to innovate in the business will lead to more spending on traditional Mode 1 core activities. Using more digital capabilities will increase the need to maintain those capabilities. Wearing fitness tracking devices will lead to better health and perhaps even lower health costs. All these changes lead to secondary effects and even tertiary effects, which will add up to more critical change than the primary disruption.

For example, the advent of self-driving cars will lead to a reduction in garages within big cities. It is also factoring into long-range real estate strategies for companies that have large parking lot acreage (such as malls). This, in turn, may lead to rezoning of urban areas to take advantage of the new space. The use of AR may well lead to a massive reduction of real-world objects that process information. When we can have a digitally represented TV on any wall we choose, why buy a real TV at all? Just as the introduction of digital TV led to HDTV, which led to streaming of digital content, which in turn led to binge watching of TV shows, we will see innovations generating a wake of new changes that most people and businesses will not see coming until it's upon them.

Gartner's top strategic predictions continue to offer a provocative look at what might happen in some of the most critical areas of technology evolution. Even more important, they help us move beyond thinking about mere notions of technology adoption, drawing us more deeply into issues surrounding what it means to be human in the digital world. Whether one is a customer, a business or an investor, these predictions will be useful for capturing the interest of strategic thinkers and fueling the excitement of tactical decision makers.

## Strategic Planning Assumptions

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**Strategic Planning Assumption:** By 2020, 100 million consumers will shop in augmented reality.

**Analysis by:** Noah Elkin

### Key Findings:

- While 100 million represents a little less than 1% of the worldwide population, the number of people shopping online is steadily increasing — from more than 1.5 billion in 2016 to 2 billion in 2019. As a percentage of even online buyers, 100 million is a small percentage, but the rise from zero will be notable.
- Immersive technologies such as augmented reality increase user engagement with a product or service by enabling a consumer to fully explore features and conveying additional information that can aid in a buying decision. This will drive immersive interfaces, including both augmented and virtual reality, to become the standard customer experience paradigm for scenarios requiring human-to-machine interactions.
- Retailers and brand marketers are deploying AR applications to enhance the shopping experience, such as allowing a customer to virtually try a product or employing location-based intelligence to bring items of interest to the customer's attention at the right time and place.

Some brands will experiment with transactions in AR-based environments, but for the most part, AR will serve to supplement rather than substitute existing physical and digital channels.

- The popularity of AR applications, such as Pokemon Go, will help propagate the technology, bringing it into the mainstream and prompting more retailers to incorporate AR into the shopping experience.
- Marketers are developing AR experiences primarily for smartphones and secondarily for tablets, which already have a sizable global installed base. Head-mounted displays (HMDs) will supplant tablets as a priority in the future.
- Improved hardware features, software integration and business cases are inspiring AR adoption among brands. These include ergonomic improvements to HMDs, better tracking and sensing algorithms, and connections to consumer and enterprise software ecosystems.

### **Market Implications:**

As omnipresent mobile device usage becomes an ingrained behavior, further blurring the lines between the physical and digital worlds, brands and their retail partners will need to develop mechanisms to leverage this behavior to enhance the shopping experience. Using AR applications to layer digital information — text, images, video and audio — on top of the physical world represents one such route to deeper engagement, both in-store and in other locations. For example, consumers pointing the IKEA catalog app at a room in their home can "place" furniture where they'd like it to go, helping to narrow their consideration set. This real-world element differentiates AR apps from those offering virtual reality (VR).

The growing imperative to bridge physical and digital experiences and assets will place heightened emphasis on customer experience. This means AR should engage your customers in a fashion that is unique to the AR experience, not duplicate an experience that customers can get better, faster or more conveniently via another medium. For example, the L'Oréal Paris Makeup Genius app allows consumers to "try on" products, test looks curated from the brand's roster of expert makeup artists and share them across their social graph, yielding a level of engagement that would be difficult to reproduce using other traditional or digital channels. L'Oréal takes that engagement a step further by enabling consumers to easily purchase the products they have tried on, bringing the opportunity to transact closer to the moment of maximum emotional inspiration. Not all AR experiences need also be commerce experiences, but you should evaluate whether incorporating AR has the potential to shrink the distance between desire and action and design the experience accordingly.

Although the bulk of AR applications will serve consumer markets, AR will see uptake in enterprises that benefit from information overlaid onto business processes, such as field service work. Other vertical markets, including automotive, education, energy, engineering, healthcare and real estate, where combining time-bound, context-specific information with real-world visualization of complex objects improves safety and productivity, also will see business impact from AR. For example, BMW's service engineers use AR and HMDs to perform car maintenance. Many businesses will use AR to enhance customer service visits and sales calls, adding a new dimension to clienteling strategies.

Excitement around HMDs is high, but market penetration will trail that of smartphones and tablets for some time. Gartner predicts sales of HMDs for both AR and VR applications will rise from 1.4 million units in 2016 to nearly 40 million by 2020. By comparison, global smartphone sales will increase from 1.42 billion in 2016 to 1.6 billion in 2020. The installed base will reach more than 4.5 billion by 2020, putting smartphones in the hands of more than half the world's population.

In 2018, more than one-quarter of HMDs will be dedicated for business use, including for tasks such as equipment repair, inspections and maintenance. HMD providers that can deliver products tightly integrated with enterprise software solutions will position themselves for growth through 2020.

### **Near-Term Flags:**

- By YE16, more than 150 million people worldwide will download the Pokemon Go app, fueling consumer appetite for immersive AR experiences.
- By YE17, one in five leading global retail brands will use AR to enhance the shopping process, resulting in dramatically higher levels of customer engagement.
- By YE18, smartphones will continue to drive more than 90% of AR-related experiences; HMDs will remain a niche market limited to enterprise use cases and a segment of the consumer population.

### **Recommendations:**

- Examine how customers engage with your brand and your products to determine where digital overlays can enhance the physical shopping and customer service experience.
- Evaluate AR implementations with an eye to scenarios where information will help shoppers and employees overcome hurdles or make key decisions at moments of truth — for example, as part of clienteling programs.
- Avoid using AR merely as a promotional ploy; AR experiences should provide functional benefits that fundamentally improve your brand's customer experience or the ability of your employees to serve customers.
- Plan carefully for the current state of hardware, audience adoption and privacy preferences, as well as extensibility of AR content into other media.
- Incorporate measures of business value, usability testing and promotion into the development process.
- Seek opportunities to leverage industry-leading platforms or apps, such as gaming interfaces, for your own branded experiences.

### **Related Research:**

"Hype Cycle for Digital Marketing and Advertising, 2016"



"Market Guide for Augmented Reality"

"Hype Cycle for Wearable Devices, 2016"

"Top 10 Wearable Technologies and Capabilities in 2017 and 2018"

"Industry Vision: Commerce That Comes to You"

**Strategic Planning Assumption:** By 2020, 30% of web browsing sessions will be done without a screen.

### Key Findings:

- More than half of U.S. teens already use voice search daily,<sup>1</sup> and usage is growing rapidly.
- New audio-centric technologies, such as Apple's AirPods, Google Home and Amazon's Echo, are making access to dialogue-based information ubiquitous and spawning new platforms based on "voice first" interactions.
- By eliminating the need to use one's hands and eyes for browsing, vocal interactions extend the utility of web sessions to contexts such as driving, cooking, walking, socializing, exercising, operating machinery and so forth. As a result, the share of waking hours devoid of instant access to online resources will approach zero.

### Market Implications:

- The rise of screenless interactions will shift even more market power to digital platform giants, such as Google, Apple, Facebook, and Amazon (along with emerging giants, such as Alibaba, Tencent and Uber), allowing them to mediate a growing share of all consumer-business interactions.
- Companies will experience great pressure to invest in voice-based technology solutions as part of the next wave of customer and employee experience design, and they will struggle not to cede too much control to large ecosystem platform providers in these endeavors. Most requisite AI platforms and standards will be controlled by these ecosystem providers.
- Public reliance on VPAs as proxies for mobile identity will increase demands on platform providers for more transparency and compliance with an increasingly complex assortment of privacy regulations. Ironically, this will erect higher barriers to entry for new disruptive challengers.
- Growing restrictions on access to walled-garden personal data accumulated from voice interactions will drive tension among digital ecosystems and raise the cost of platform neutrality.

### Near-Term Flags:

By year-end 2017:



- More than 5 million Apple iPhone users will use AirPods to communicate vocally with their mobile devices (this is less than 1% of the iPhone installed base of 550 million users).
- Room-based screenless devices such as Amazon Echo and Google Home will be in more than 10 million homes.
- A new search engine optimization (SEO)-like service industry aimed at helping companies develop information and marketing systems tailored to voice and VPA-mediated dialogs will be generating more than \$250 million in annual revenue.
- Five percent of consumer-facing websites will feature audio interfaces (including voice-enabled social chatbots).
- Natural-language recognition and voice synthesis will reach the point where it becomes difficult to distinguish between humans and machines in common sales and service dialogs where transitions between machine and human operators may occur seamlessly.

### **Recommendations:**

- Compile a catalog of use cases where screenless interactions are likely to create value for customers and employees. Document the gaps in supporting these.
- Project the emergence and impact of VPA-based ecosystems in your industry. Determine how digital giants are likely to mediate customer relationships and discovery processes.
- Gauge the impact of vocal dialogs on all your SEO-related activities. Compose messages that answer specific questions and can be rendered in a natural voice.
- Focus R&D and center of excellence resources on exploiting the disruptive potential of vocal services and relationships.

### **Related Research:**

"Algorithmic Marketing Essentials"

"Building a Digital Business Technology Platform"

"Emerging Technology Analysis: Natural-Language Question Answering"

"Market Insight: Conversational Commerce — Hype or Reality?"

**Strategic Planning Assumption:** By 2019, 20% of brands will abandon their mobile apps.

**Analysis by:** Charles S. Golvin

### **Key Findings:**

- Many brands are finding that their mobile apps are not paying off. These apps are not delivering the level of adoption and customer engagement that companies expected.

- The number of apps available in the Apple/Android app stores is so high — at least 2 million in each store — that discovery is a huge impediment to adoption.<sup>2</sup>
- The cost of application support, not only in maintenance, upgrades and customer care, but also in marketing to drive downloads, throw into disarray the original ROI calculations.
- Alternative approaches lower barriers to discovery and install and offer applike levels of engagement at a fraction of the investment, support and marketing cost. Examples include "live" mobile wallet cards and in particular progressive web apps, which better leverage existing brand investments in web presence.
- Brands are investing to build presence in consumer messaging apps, such as Facebook Messenger and iMessage, to reach customers in the apps where they spend a high percentage of their time.

### Market Implications:

Since 2010, executives at [Fortune 2000](#) companies, witnessing the unprecedented growth in smartphone adoption and the subsequent explosion of the application market, have declaimed, "We need an app." Smartphone applications have birthed multi-billion-dollar companies such as Uber, but the application market has not been an unmitigated success — some brands have invested significant amounts to develop and market one or more applications only to discover that their anticipated level of customer engagement failed to materialize. These companies then face the choice of abandoning their investment — as well as inciting the likely wrath of customers who did download and use their app — or doubling down on their investment in the hope of realizing their desired results.

Over this period, Gartner has received a significant number of inquiries along the lines of "Should we have an app?" and "What is the role of an app versus our mobile website?" New smartphone features and attendant marketing techniques, such as Bluetooth beacons and mobile wallets, prompt related requests as marketers seek to leverage these new techniques. We have also fielded numerous inquiries from companies disappointed with the results from their application investment, seeking to learn from the experience of companies that have hit the app jackpot. In many of these cases, it is clear that the company's expectations were overinflated and that its investment will never pay off.

As the number of applications available in Apple's App Store and Google Play continues to rise, companies will face ever-greater challenges — and costs — in realizing their desired foothold on customers' devices. Google's efforts to make the mobile web more "applike," using techniques such as instant web apps and progressive web apps, will gain traction with companies because the mobile web is a requisite component of their digital presence, the mechanism with the widest reach in today's ubiquitously connected environment. Many of these companies will evaluate these experiences against their underperforming applications and opt to reduce their losses by allowing their apps to expire.

One clear outcome from this transition will be Apple's reluctant embrace of the mobile web as a vehicle for customer engagement. As brands invest in a more functional and responsive mobile web presence, Apple will add support in Safari for many of Google's mobile web innovations.

**Near-Term Flags:**

- By YE17, the number of branded applications realizing growth in average monthly usage will decline from YE16; this decline will continue in subsequent years.
- By YE18, the cost of marketing a nongame application as a function of the number of downloads will at least double.
- By YE18, the average number of applications installed and used regularly by an adult smartphone owner will cease to increase and subsequently remain flat.

**Recommendations:**

- Assess your mobile marketing strategy against the "mobile-centric" and "mobile-extender" types to evaluate whether your mobile marketing efforts are correctly prioritized (see "Two Types of Mobile Marketers: Which One Are You?").
- Evaluate emerging solutions, such as mobile wallet cards, progressive web apps and instant apps, to determine whether they offer a level of functionality that merits investment. Perform a gap analysis between this level of functionality and that offered by your existing application(s).
- Measure overall app performance against the foundational ROI calculations that you developed to justify the launch of your application.

**Related Research:**

"Hype Cycle for Digital Marketing and Advertising, 2016"

"Two Types of Mobile Marketers: Which One Are You?"

"The Mobile App Dilemma: One App Versus Many"

"Hype Cycle for Mobile Applications and Development, 2016"

**Strategic Planning Assumption:** By 2020, algorithms will positively alter the behavior of over 1 billion global workers.

**Analysis by:** Gavin Tay

**Key Findings:**

- Employees, as consumers, are already familiar with behavior influencing through contextualization algorithms introduced by e-commerce companies, such as Amazon, to profitably influence billions of shopping decisions.
- Advanced algorithms are intersecting with behavioral insights from psychology, social neuroscience and cognitive science to positively or negatively reinforce desired behavioral outcomes.

- An emerging set of "persuasive technologies" leverages big data from myriad sources, mobile, IoT devices and deep analysis to positively influence behavior without coercion, ideally in a relationship of mutual benefit.
- Social sentiment algorithms are triggering and swaying human emotions of employees, consumers, citizens and voters via consumer apps such as Facebook, WhatsApp or Telegram.
- The Pokemon Go phenomenon showed how gamification algorithms, combined with augmented reality, can induce people to leave the indoors and step into the wider world, with potential benefits for fitness and health and for local businesses.

Several organizations already are early adopters of such persuasion algorithms:

- JPMorgan Chase, which has racked up more than \$36 billion in legal bills, introduced an algorithm to forecast and positively influence the behavior of thousands of investment bank and asset management employees to minimize mistaken or ethically wrong decisions.
- Richard Branson's Virgin Atlantic airline teamed with economists in an experiment that used influence algorithms to guide its pilots in using less fuel, resulting in savings of 6,828 metric tons of fuel worth £3.3 million.
- Cisco U.K. uses an algorithm-based people management app that obtains insight into how its employees view the world, leveraging that knowledge to energize its 72,000 employees and to persuade managers to adapt their approach to reorganization.
- Jawbone's fitness tracker uses a Smart Coach algorithm to influence fitness behaviors — for example, by showing users that for every 30 minutes past normal bedtime, they will be 8% less active the next day, or by sending reminders to chair-bound users to move 27% more often.

### **Market Implications:**

- Mobile app stores that created the "app economy" will be taken a step further with algorithm marketplaces (such as Algorithmia, Alteryx and Apervita) that will enable influence algorithms to be brokered and used widely as building blocks for employee-facing (and customer-facing) solutions.
- Algorithms can positively alter human behavior by augmenting human intelligence and experience, through a kind of collective "memory bank" of knowledge that has been socialized and put to the test. Employees can access this algorithmic "wisdom" in their work to be more productive and more satisfied with their achievement.
- Unethical use of influence algorithms to manipulate rather than engage people will have widespread impacts. Legislation, regulations and codes of conduct to protect consumers will challenge IT and business leaders.
- Use of persuasion algorithms can raise numerous "creepiness" alarms, but when used to effect positive outcomes, they will bring changes to a wide range of areas, such as healthcare, education, training, human resources, government, insurance and retail, as well as business growth in a stagnated or downtrend economy.

- Companies that adopt a "mutual benefit" approach to influence algorithms will gain competitive advantage in discerning customers' real needs or desires and demonstrating how their products and services can satisfy those.

### **Near-Term Flags:**

- By YE17, at least one commercial organization will report significant increases in profit margins because it used algorithms to positively alter its employees' behaviors.
- By YE18, three consumer service providers will employ interdisciplinary methods that combine design and behavioral science interventions to increase customer loyalty and double its profits.
- By 2018, a major software vendor will incorporate into its portfolio persuasive capabilities that motivate people to change their attitudes and behaviors.
- By YE19, at least one internet vendor will face litigation charges because it had thought-controlled its customers or users.

### **Recommendations:**

- Experiment with and exploit persuasive algorithms that address the perpetual business need of talent retention and attraction.
- Prioritize the conscious improvement of employee behavior through positive influence and by eliminating bias.
- Build trust and transparency to avoid "algorithm aversion" and allay fears of infringing on workers' rights. Algorithms must benefit both the organization and the worker — not one or the other.
- Build, maintain and own the intellectual property (IP) of your organization's mission-critical algorithms to eliminate the potential risk and dependency that third-party algorithms bring with them.
- Identify justifiable business scenarios that can benefit from the use of algorithms. Algorithms are becoming more powerful and pervasive, but not all are ready for mainstream use, with some that are only viable in the near term (two to three years), while others are only viable in the longer term (more than five years).
- Ensure that the business benefit and worker transformation outweigh the potential negative impact. Algorithms have resulted in unintended and extreme consequences, such as the 7 October 2016 flash crash of 6.1%, which led to a 31-year low of the British pound. Other examples include a book being priced at \$24 million and robots hurling derogatory and discriminating remarks.

### **Related Research:**

"Explore Algorithmic Business to Drive Differentiation"

"Top 10 Things CIOs and CDOs Need to Know About Algorithmic Business"

"Smart Agents Will Drive the Switch From Technology-Literate People, to People-Literate Technology"

"Smart Machines See Major Breakthroughs After Decades of Failure"

"Match Talent Profiles to Algorithmic Business Ambitions"

"Apply Gartner's Information Capabilities Framework to Achieve Algorithmic Business Success"

"Three Steps to Enrich the Customer Experience With Contextualized Communications"

**Strategic Planning Assumption:** By 2022, a blockchain-based business will be worth \$10 billion.

**Analysis by:** David Furlonger, Martin Reynolds, Ray Valdes and Fabio Chesini

### Key Findings:

- Blockchain applications can free up cash, create new forms of value, reduce transaction costs and accelerate business processes.
- Blockchain development is still immature, but the technology can start to deliver value, with the potential for extreme society, business and technological disruption.
- Blockchain is attracting product and capital investment.

### Market Implications:

Blockchain technology is established as the next revolution in transaction or event recording. A blockchain ledger provides an immutable, shared view of all transactions between engaging parties in a distributed, decentralized network.

Parties can therefore immediately act on a committed blockchain record, secure in the knowledge that it cannot be changed. Any kind of value creation and exchange can happen in minutes, not days.

However, blockchain remains an immature technology. The bitcoin blockchain ledger itself is well-understood. Implementation is at an advanced state for its limited use case, and multiple synchronized nodes are possible. However, acceptance by businesses and government agencies of its trust mechanism remains an issue. The first issue is the mechanism by means of which nodes validate blocks, which is a combination of majority voting, cryptographic techniques and transaction rights. The second is the ability of any individual user to add transactions without the need for traditional authentication and verification mechanisms. The third is the impact on any centralized or sole provider value chain. Any industry exercising control over a supply chain (such as banking) can be disintermediated.

These challenges create a dichotomy between the potential for virtually unlimited peer-to-peer commerce and the desire for transparency and regulation over potentially untrusted movement of

assets and commercial activity. As the distributed ledger technology evolves from the original blockchain architecture, variegated trust models will develop, depending on use case and societal acceptance.

Eventually, smart contracts will enable dynamic alignment of legal responsibility and required commercial outcome via business being transacted with human oversight. These smart contracts automate at a reliability, customization level and speed not achievable with traditional business systems.

There are four major implications for businesses:

- First, businesses built on large IT stacks will be able to re-engineer their operating and IT enablement models, relying on distributed ecosystems of infrastructure, data management and application provision.
- Second, blockchain systems will remove the need for centralized intermediation of value chains. Consumer and business transaction costs will be greatly reduced, creating obvious preferences for blockchain-enabled ecosystems.
- Third, blockchain systems and smart contracts will allow near-immediate response to business opportunities, value creation and transfer at a microlevel. Companies that fail to participate will face financial disadvantage.
- Fourth, the perception of who or what is a customer will change as entities (machines, devices, people and so forth) gain increasing levels of economic and legal provenance, changing the understanding of the nature of and relationship with a client.

Due to blockchain's open-source nature and the proliferation of a diverse ecosystem of technology providers, CIOs face a difficult decision regarding designing and developing and whether to partner with a startup or wait for a more established vendor network to develop.

The challenge for blockchain users and CIOs is to set appropriate expectations among business leaders: Plan for a reasonable rollout, failure and recovery (especially through 2018); develop realistic proof of concept (POC) use cases; and be agile from an IT and business perspective to follow the best path to success.

#### **Near-Term Flags:**

- Through 2017, multimode blockchains and distributed ledger POCs will be deployed across industries and government agencies.
- In 2018, there will be successful partial standards developments, governance models and implementations.
- By 2019, there will be effective multivariant trust model solutions.
- By 2020, new businesses and business models will emerge, based on smart contracts and blockchain efficiencies.



**Recommendations:**

- Examine your business for processes where transaction inefficiency constrains growth, and use business capability modeling to assess the potential of distributed networks.
- Cautiously engage in discussions with technology suppliers to see where they can help. Be prepared to use different methods of due diligence and procurement to assess vendor capabilities.
- Educate senior business executives on the potential disruption to industries and enterprises.
- Do not bet on immediate business results; instead, create a long-term strategic planning roadmap for blockchain discontinuity.

**Related Research:**

"Blockchain Will Prove to Be a Risky Route for Payment Systems"

"What Insurance CIOs Need to Know About Blockchain"

"Experiment With Blockchains for Data Management Innovation"

**Strategic Planning Assumption:** By 2021, 20% of all activities an individual engages in will involve at least one of the top-seven digital giants.

**Analysis by:** Hung LeHong

**Key Findings:**

- The current top-seven digital giants by market capitalization are Google, Apple, Facebook, Amazon, Baidu, Alibaba and Tencent. They are already a huge part of our lives and dominate our digital world in terms of web search, mobile, social networking, messaging and music streaming. Although the top-seven digital giants may change slightly by 2021, their goals will remain the same: to be part of our digital lives.
- Sixty percent of the world's population is in Asia, with 2.5 billion in China and India alone — so there is great room for the emergence of other Asian digital giants based on volume alone.
- Their digital domination will not be restricted to just the digital world. As the physical, financial and healthcare worlds become more digital, many activities an individual engages in will be connected — and therefore within reach of the digital giants. This combined effect of the digital worlds and physical worlds converging results in our prediction that any activity could include one of the digital giants. Think about doing laundry, visiting your grandmother, dining with a client, getting to another city, baking a cake or riding a bicycle. Mobile apps and payments, smart agents (such as Amazon Alexa), and digital ecosystems (such as Apple HomeKit, WeChat Utility and City Services) will make the digital giants part of many activities we do as individuals.

- The physical world is coming "online": Cars, items in the home (such as appliances) and assets in the workplace (such as hospital equipment and industrial assets) will all get connected.
- By the end of the decade, 80% of all new vehicle models in mature markets will have data connectivity, and 30% of connected vehicle models will have built-in, function-level, over-the-air software update capabilities (see "Predicts 2016: Automobiles Become Digital Endpoints in the Era of Smart Mobility").
- By 2020, nearly 40 million cars will be using Android Auto and 37.1 million will be using CarPlay.<sup>3</sup>
- In 2016, the majority of users are using stand-alone connected home products or do-it-yourself ecosystems. By 2020, 85% of users' connected home solutions will be linked to a certified ecosystem (see "Market Trends: The Connected Home — A Move Toward Certified Ecosystems").
- Our health and fitness lives are also being connected through wearables and connected medical devices (such as blood glucose monitors).
  - One hundred seventy million patients a year will be able to use Apple's HealthKit through Epic's MyChart application — the most-used patient portal in the U.S.<sup>4</sup>
  - In 2020, 477.75 million wearable electronic devices will be sold, generating revenue of \$61.7 billion. Of that, \$13.7 billion will be spent on fitness-related wearables (see "Forecast: Wearable Electronic Devices, Worldwide, 2016").
  - By 2019, wearable devices plus IoT platforms will be used to monitor at least 30% of hip and knee replacement patients (see "Predicts 2016: Healthcare Provider CIOs Must Address the Clear Signposts of IT's Sea Change").
- Financial services are already seeing a significant threat from digital companies. Financial technology (fintech) startups and the top-seven digital giants pose the greatest threats:
  - A Goldman Sachs report in early 2015 estimated that a part of traditional financial services revenue (\$4.7 trillion out of \$13.7 trillion) is at risk of being displaced by new technology-enabled entrants, which include those in fintech.

### Market Implications:

- The success of the digital giants implies that leveraging data and analytics, as well as global scale, is the way to win in digital. There will be challengers to the giants that have scale and data, and they will need to invest heavily in innovative technologies.
- Collectively, the digital giants will have direct and indirect knowledge of what we do as individuals. For example, because of HomeKit, Apple may have a good estimate on which parts of a city's population cook the most (and when) since appliances will be connected to the HomeKit ecosystem.

- The fundamental issue will be what the digital giants do with the data. Most of it will be used to provide more effective advertising and engagement, as this is the main business model of most digital giants currently, and this will not change drastically by 2021. New ways to monetize the data may also surface, such as in the previous example: Apple may choose to sell connected home usage data, just like Nielsen sells TV viewing data.
- Another emerging implication is that all this data will "feed" the training algorithms used to build smarter agents and bots such as Google Now, Alexa and WeChat bots. Essentially, the more training data these algorithms receive, the better/smarter the AI becomes. By building digital ecosystems for the connected home, email, messaging, cars, music and so forth, the digital giants will be able to ingest huge amounts of data in many areas — resulting in better AI.
- Privacy regulations will limit the amount of data the digital giants will be able to gather, store, use and sell. However, new sources of data, insight and intelligence will still become available. For instance, in the connected home example, a digital giant may not be allowed to keep data at a household level, but it may do so at an aggregate level, such as zip or postal code.

#### **Near-Term Flags:**

- By 2018, more than 10 billion things will be connected in the combined consumer and business worlds.
- By 2020, 20% of homes will be connected homes containing more than 25 things accessing the internet.
- By 2020, 85% of users' connected home solutions will be linked to a certified ecosystem.

#### **Recommendation:**

- Be deliberate about your enterprise's stance with the digital giants: Work with them, against them, or a combination of both. Digital giants will not just connect the world; they need the permission of companies and governments to access this world. For example, public transportation companies willingly give their route and schedule data to Google Maps. Your enterprise will decide what the digital giants will connect and have access to.

#### **Related Research:**

"Maverick\* Research: China vs. U.S. — Digital Giants Battle for Global Disruption"

"Think at the Scale of Civilization Infrastructure to Plan for Digital Business"

**Strategic Planning Assumption:** Through 2019, every \$1 enterprises invest in innovation will require an additional \$7 in core execution.

**Analysis by:** Allie Young and Pat Sullivan

**Key Findings:**

CEOs, boards of directors, CFOs and chief digital officers have different responsibilities for accomplishing the development of their digital business strategies; these leaders have justifiably focused initial investments on business-IT innovation to ideate/create their response to digital competitiveness in their industries.

For many enterprises, adopting a bimodal style of IT work to jump-start innovation has been a priority and critical first step. Frequently, this business-driven innovation is realized through Mode 2-style workshops. Most innovation projects involve external providers that bring expertise in design thinking, business model reinvention, operating model redesign and industry insights. However, since innovation engagements are typically experimental and designed for "fail fast," many of these efforts will not be slated for implementation.

The goal of innovation projects is to take an idea through a POC to demonstrate the feasibility and design to enable these to be approved and moved into implementation. However, the complexities, scale and business change ramifications of significant change initiatives will require IT teams to convert the POC into reality and assure the ongoing operation is secure, efficient and reliable.

Depending on the nature of the "legacy" IT environment, as well as the degree of modernization of the existing portfolios and IT infrastructure, the complexity (and thus the cost) of execution will vary. Close alignment of innovation and deployment teams is tantamount to successful realization of the digital business goals.

**Market Implications:**

Gartner defines "bimodal" as the practice of managing two separate but coherent styles of work — one focused on predictability, and the other on exploration. "Mode 1" is predictable, improving and renovating in more well-understood areas, and "Mode 2" is exploratory, experimenting to solve problems or evolve new breakthrough ideas. Innovation discussions to quickly set forth a digital business strategy are top of mind for business leaders — but what is not understood fully is that the deployment costs of the POC "ideated solution" is not necessarily considered during the innovation phase, and for most, the costs to deploy the POC are not factored into the initial funding.

In fact, for most innovation projects, the full impact on existing IT and business processes is not understood until detailed roadmaps and plans to implement the changes are made. Frequently, IT teams are specifically assembled to develop and/or execute these plans. The expertise (delivered by process owners and internal IT, alongside external providers in many cases) requires a detailed design to implement, integrate, operationalize and manage the ideated solution, and that can be significantly more than the initial innovation costs.

If legacy environments are outdated and comprise extensive custom applications, deployment work efforts may experience the need for significant IT transformation, and the costs associated will be exponentially higher. Additionally, if business process change management and restructuring costs are high, this will raise the cost to change into the new digital processes, products and services.

Thus, we anticipate that for every \$1 spent on digital innovation/ideation initiatives, enterprises will spend on average \$7 for deploying the solution. (The range we use is \$5 to \$10 for Mode 1 work, with organizations with heavily customized or unmodernized IT being at the high end of the ratio, and more modernized environments being at the low end.)

### **Near-Term Flags:**

- By 2018, IT service providers' modernization engagements to support digital innovation deployments will increase by at least 30% over 2016 spending levels.
- By 2018, CIOs will prioritize bimodal transformation investments to implement successful pilots, in part funded by ongoing cost takeout of current operations.

### **Recommendations:**

- Demonstrate leadership, personal involvement and commitment to developing and implementing your digital business strategy.
- Develop rigorous evaluation of the needed IT modernization and transformation investments required to execute the innovation POC. Full IT involvement in innovation projects will be mandatory to accurately scope the execution costs.
- Act decisively when engaging in digital business pursuits to appropriately fund the bimodal initiatives; initiating the innovation phase is comparatively easier than sustaining it.
- Overcome roadblocks to supporting digital business strategy enablement by embracing bimodal work styles, and engaging your CIO to support close alignment with the C-suite leaders; you must ensure both business leaders and IT are on board and able to bring the needed expertise, culture, governance and workflows to support fast, agile ideation and rigorous and effective implementation.
- Engage IT service providers with bimodal skill sets/characteristics to support your ideation and implementation.

### **Related Research:**

"The Most Common Barriers to Adopting Bimodal, and How to Overcome Them"

"IT Services Providers Must Demonstrate New Characteristics to Succeed in Bimodal Work Styles"

"Technology Service Providers Must Implement a Bimodal Roadmap or Risk Irrelevance and Decline"

**Strategic Planning Assumption:** Through 2020, IoT will increase data center storage demand by less than 3%.

**Analysis by:** Peter Middleton and Joseph Unsworth

**Key Findings:**

- There will be massive potential for data generation in 2020, with 21 billion IoT endpoints estimated to be in use; however, only a fraction of this data will actually be retained and stored.
- The cumulative IoT data stored in 2020 will come from consumer and business applications. Consumer IoT applications will account for only 3% of this data and business IoT applications 97%.
- Looking at total storage by industry vertical, healthcare providers, manufacturing and natural resources, transportation, and utilities have the greatest storage requirements (for total sensor data) due to a combination of the business value of the data and data retention requirements. Physical security, which spans industry and consumer applications, will generate the greatest amount of data, however.
- Of the roughly 900 exabytes worth of data center hard-disk drive (HDD) and solid-state drive (SSD) capacity forecast to ship in 2020, IoT discrete sensor storage will represent only 0.4%, with storage from multimedia sensors consuming another 2.0%, for a rounded total of 2.3%. This indicates that IoT can scale and deliver important data-driven business value and insight, while remaining manageable from a storage infrastructure standpoint throughout the forecast period.

**Market Implications:**

The Internet of Things has enormous potential for data generation across the roughly 21 billion endpoints expected to be in use in 2020. Hidden within this vast ocean of data lies value; however, to unlock its potential, this data must be ingested, secured, stored and analyzed. Data storage comes at a cost as data center hardware and software infrastructure are fundamental to developing a successful IoT architecture predicated on managing the ingestion, security, storage and analysis of device data. For organizations to succeed at this (thus signaling greater storage demand for vendors in the supply chain), a clear pathway of ROI must be achieved. To justify their infrastructure investments, organizations need to see tangible business value from customer-facing revenue-generating opportunities, as well as increased agility and improved operational efficiencies.

It is important to note that the raw data storage figures do not take into consideration data reduction technologies, which would potentially reduce the storage footprint, nor do they factor in backup and recovery or replication for higher availability, which would potentially increase the storage footprint.

**Near-Term Flags:**

- Through 2017, many advanced IoT projects will remain at the pilot or business unit stage, inhibiting cross-sharing of large quantities of data across the organization.
- Through 2018, there will be no significant new regulatory requirement to store multimedia sensor data for longer than is true today.

- Through 2019, storage system vendors will not see an upward breakout in growth from IoT applications.

### Recommendations:

- Use an IoT pilot project to explore new analytics techniques and algorithms and to develop a strategy on data retention based on identified business insight.
- Storage comes at a cost; don't assume that all sensor data must be stored. Filter out steady-state trends, and develop a data reduction strategy based on regulatory requirements, industry best practices and a review of the likely business value of the accumulated data.
- Seek technology partners with experience in analytics, data management and storage in your industry.
- Ensure that the projected economic value of the data drives greater business agility and/or operational efficiency, and outweighs the necessary infrastructure investments to store and analyze additional data efficiently.

### Related Research:

"Forecast: IoT Data Storage Capacity, 2013-2020"

"Forecast: Internet of Things — Endpoints and Associated Services, Worldwide, 2015"

"Preparing, Planning and Architecting for the Internet of Things"

"Reduce Your Video Surveillance Storage Costs With These Three Best Practices"

"Infrastructure and Operations Leaders: Prepare for the IoT Rush"

**Strategic Planning Assumption:** By 2022, IoT will save consumers and businesses \$1 trillion a year in maintenance, services and consumables.

**Analysis by:** Benoit Lheureux, Martin Reynolds and Alfonso Velosa

### Key Findings:

- Assets under maintenance globally exceed \$240 trillion, with maintenance costs of \$27 trillion.
- Moving to predictive maintenance can often save 10% to 20% over preventive maintenance.
- IoT, properly deployed, can unlock this \$1 trillion savings opportunity.

### Market Implications:

IoT holds enormous promise in reducing the cost of maintenance and consumables. Everything from restrooms to cruise liners have costs associated with inspection, pre-emptive replacement, wasteful consumption, unexpected downtime and customer disappointment.



The challenge to deriving these savings is that of any IoT project: a secure, robust implementation that can deliver savings over one or two decades, without itself driving management costs that absorb any savings made.

We observe two extremes for these projects. At one extreme is inexpensive monitoring: simple sensors that report defining characteristics to analytical servers. The analytics are used to spot patterns in the fleet data, and recommend maintenance based on actual usage and condition, not based on elapsed time or estimated condition. Using IoT platforms such as Amazon Web Services enables very inexpensive monitoring and management. For example, the quantity of drinks sold from a vending machine, with relatively few and simple transactions, would fit well into this space. The data can be analyzed with simple mathematics and rules, and it allows the technician to visit the machine only when necessary — not on a fixed schedule such as every other day — and with the right parts and equipment. A little more processing allows for automated replenishment and for adjusting inventory to follow seasonal changes in buyer behavior.

At the other extreme, we have the rise of the "digital twin." In its purest form, a digital twin is a dynamic, high-fidelity software simulation of a physical system. Initially used for design and simulation processes, a digital twin can contain a complete copy of the manufacturing data for a product. Digital twins are now being deployed as digital models (or "avatars") of individual or composite devices, such as large pumps, airframes and turbines. The digital twin captures near-real-time data feeds from its sensor-enhanced real-world twin, and it uses this, along with other data sources (such as weather data, historical data, algorithms and smart machine analysis), to update its simulation to reflect the physical state of the twin. Now, the digital twin can be inspected instead of the physical object. This is really valuable, for example, in the case of a submerged sewage pump or any other asset for which live, on-site inspection is inconvenient, costly or hazardous.

This precise understanding of the state of the physical twin moves complex systems from historical-data-based preventive to actual-condition-based predictive maintenance — and improves the readiness of the physical system. This approach is very useful in the case of systems with significant consequences in the case of failure, and it is a simple way of summing up the business value proposition of "no unplanned downtime."

A simpler example is extending the life of the oil in a car engine, from a prescriptive replacement "every five thousand miles" to replacement when triggered by directly measured physical engine performance. Even small savings aggregated across many products and populations can dramatically cut consumer maintenance costs and improve user experience through increased reliability.

Table 1 exposes some of the highest-value asset fleets where we see potential savings of \$0.8 trillion; the balance of the \$1 trillion comes from smaller opportunities across other various industries and consumers. These estimates focus on reduction of maintenance costs and consumables, but they do not include the additional benefits, such as additional revenue generated through improved customer experience and savings to society as a result of reduced consumption of natural resources.

Table 1. Examples of Savings From High-Value Asset Fleets (Trillions of U.S. Dollars)

Type of Asset	Capital Total	Savings
Large commercial buildings (>100,000 square feet)	34.8	0.28
Power plants	25.4	0.23
Commercial trucks	14.4	0.13
Automobiles	27.6	0.11
Large commercial aircraft (passenger and cargo)	7.8	0.07
<b>Total</b>	<b>110.0</b>	<b>0.82</b>

Source: Gartner (October 2016)

### Near-Term Flags:

- Emerging use cases demonstrating the use of IoT to drive predictive maintenance
- Proliferation of digital twin models to optimize predictive maintenance efforts by 2020
- Reporting of improved efficiency based on IoT implementations by 2018
- Software models of physical assets provided by suppliers by 2020

### Recommendations:

- Identify costs associated with scheduled maintenance and consumable expenses.
- Target a 10% reduction of these costs, based on a shift to a predictive regime.
- Build a roadmap to implement IoT projects against the portfolio, targeting the fastest returns. Initially focus on larger, more complex and expensive assets — where downtime and waste are expensive — and instrument to deliver "low-hanging fruit" cost savings. Start with POC projects that have short payback periods in order to build momentum for these projects.
- Continue to prioritize additional IoT instrumentation for additional cost savings until you approach the point of diminishing returns.

### Related Research:

"Use the IoT Platform Reference Model to Plan Your IoT Business Solutions"

"Hype Cycle for the Internet of Things, 2016"

**Strategic Planning Assumption:** By 2020, 40% of employees can cut their healthcare costs by wearing a fitness tracker.

**Analysis by:** Manjunath Bhat and Angela McIntyre

### Key Findings:

- The problem of sedentary lifestyles has reached pandemic proportions. In high-income countries, 41% of men and 48% of women are insufficiently physically active, compared with 18% of men and 21% of women in low-income countries. The good news is that physical activity is known to reduce the risk of developing Type 2 diabetes and cardiovascular disease.<sup>5</sup>
- People who are insufficiently physically active have a 20% to 30% increased risk of mortality compared with those who engage in at least 30 minutes of moderate-intensity physical activity most days of the week. Insufficient physical activity is the fourth leading risk factor for mortality.<sup>5</sup>
- Fitness trackers are useful to people who set weekly goals by tracking progress on a daily basis. Devices that can monitor heart rates can ensure that the user engages in a fitness program with an intensity and duration that is not only useful, but also more effective.<sup>6</sup>
- Among males, walking at least 30 minutes a day was linked to an 18% lower risk of coronary artery disease. Among females, walking at least three hours a week was linked to a 35% lower risk of heart attack and cardiac death and a 34% lower risk of stroke.<sup>7</sup>
- According to a recent study by the World Health Organization, 422 million adults worldwide suffer from diabetes, which can lead to other complications, such as stroke, blindness and heart attack.<sup>8</sup> Clinical studies show a 58% reduced risk of getting Type 2 diabetes with physical activity of 30 minutes per day, usually by walking or through other moderate-intensity exercise, which also contributed to a loss of 5% to 7% of body weight.<sup>9</sup>
- Wearables enable healthcare providers to remotely monitor the health of patients most at risk, such as those recently released from the hospital and those with heart conditions. Such monitoring will help keep patients on the path to recovery and identify problems earlier, potentially reducing overall costs.<sup>10,11,12</sup>

### Market Implications:

Organizations will strive to make healthy lifestyle a part of company culture. Companies will increasingly include roles, such as a fitness program manager or health coach, who work closely with HR leaders to include fitness trackers in wellness programs as part of a broader employee engagement initiative. C-level executives will visibly participate, including making their exercise data available to employees.

Corporate fitness programs that are designed to use gamification techniques will be able to sustain employee participation over the long term. A gamification platform aggregates data from wearable devices in real time and promotes healthy behavior (or "healthy" competition) through social interactions. Wellness programs typically include gamification and may utilize third-party gamification platforms, integrating with fitness tracking devices.

Most fitness trackers have an accompanying smartphone app that can be used to manage daily progress and relay the data to a health and fitness analytics platform. Employers will utilize third-party wellness providers to maintain the privacy of employee data and provide dashboards of overall employee health. Anonymized data harnessed from the fitness trackers will allow enterprises to make more informed choices among healthcare benefits and insurance packages, potentially reducing expenses, while providing similar value to employees.

Healthcare can save lives and downstream costs by acting on the data from wearables that show health risks to the user. Wearables provide a wealth of data to be analyzed either in real time or in retrospect, with the potential for doctors and other healthcare professionals to have access to both contextual and historical information, if the patient agrees to share it. Wearable devices may be effective in mobile health monitoring solutions that track biometric data for preventive medicine and rehabilitation after surgery, such as daily activity level or exercise specific to physiotherapy. Services using fitness trackers can also send life-saving alerts if there is a potential injury (such as a fall) or health problem (such as heart arrhythmia).

Smartphones, smartwatches and other wearables will become an important link between the patient and the healthcare provider. Smartphones have the ability to provide location, connect to fitness trackers and sensors around them, and identify the individual. Smartwatches often have health tracking capability, have GPS for location, and will increasingly be able to connect to the internet independent of the phone.

Fitness trackers have been implemented first by wellness programs typically for larger enterprises in North America and Western Europe and for multinational corporations. Therefore, the prediction is applicable to employees of those companies in the 2020 time frame. How employees save on healthcare costs will depend on their country. For example, in the U.S., employees may receive incentives that can be used to decrease their insurance deductible or co-pay. In other countries, savings may pertain more to out-of-pocket expenses or to rewards from sharing fitness tracker data with government health services.

### **Near-Term Flags:**

- By 2017, 70% of multinational corporations will sponsor the use of wearable fitness tracking devices.
- In 2018, 28% of workers at companies in the U.S. with more than 100 employees and access to wellness programs will drive 15% of total fitness tracker purchases.

### **Recommendations:**

- Provide wellness programs that support the use of fitness trackers that can wirelessly share their data, and incentivize participants to exercise through gamification and monetary rewards.
- Actively lead a culture of wellness by encouraging participation in exercise at all levels in your organization, and often communicate program benefits and privacy protection.
- Quantify organizational metrics and patient outcomes that can serve as a baseline for measuring the impact over time of health and wellness programs that use fitness trackers.

**Related Research:**

"SWOT: Fitbit, Devices and Platform, Worldwide"

"Market Insight: Disruptive Macro Trends for 2025 Personal Tech Market — Holistic Wellness"

"Achieve Business Cost Optimization With Human Capital Management Technology"

"Maverick\* Research: Shape Up or You Won't Get Healthcare"

"Business Moment: Wearable Technology Predicts and Prevents a Diabetic Crisis"

"Forecast: Wearable Electronic Devices, Worldwide, 2016"

"Gartner Invest Research Community Vision: Wearables in the Enterprise Are So Much More Than Watches"

## Gartner Recommended Reading

*Some documents may not be available as part of your current Gartner subscription.*

"Top Strategic Predictions for 2016 and Beyond: The Future Is a Digital Thing"

"Gartner's Top Strategic Predictions for 2015 and Beyond: Digital Business Is Driving 'Big Change'"

"Smart Machines Demand a Smart Approach to IT Asset Management"

"Smart Machines See Major Breakthroughs After Decades of Failure"

### Evidence

<sup>1</sup> ["OMG! Mobile Voice Survey Reveals Teens Love to Talk."](#) Google.

<sup>2</sup> ["Number of Apps Available in Leading App Stores as of June 2016."](#) Statista.

<sup>3</sup> ["Apple's CarPlay and Google's Android Auto Will Soon Dominate Connected Car Services."](#) Business Insider.

<sup>4</sup> ["EHR Giant Epic Explains How It Will Bring Apple HealthKit Data to Doctors."](#) VentureBeat.

<sup>5</sup> ["Quick Facts on Physical Inactivity."](#) World Heart Federation.

<sup>6</sup> ["Can Digital Fitness Trackers Get You Moving?"](#) Harvard Health Publications.

<sup>7</sup> ["Walking: Your Steps to Health."](#) Harvard Health Publications.

<sup>8</sup> ["Diabetes."](#) World Health Organization.

<sup>9</sup> ["Clinical Alert: Diet and Exercise Dramatically Delay Type 2 Diabetes; Diabetes Medication Metformin Also Effective."](#) U.S. National Library of Medicine.

<sup>10</sup> ["Ochsner Health System."](#) Apple.

<sup>11</sup> ["KTVU News Features BeVital Protocol, a Combined BePatient and Vital Connect Solution."](#) Vital Connect.

<sup>12</sup> ["Essential Health Apps for Apple Watch: Revolutionizing Doctor-Patient Care."](#) SiliconANGLE.

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