Top Strategic Predictions for 2018 and Beyond: Pace Yourself, for Sanity's Sake

Published: 29 September 2017 **ID:** G00340316

Analyst(s): Daryl Plummer, Whit Andrews, Hank Marquis, Mike McGuire, Fabio Chesini, Adrian Leow, Martin Reynolds, John-David Lovelock, Janelle Hill, David Furlonger, David Smith, Charles Golvin, Alfonso Velosa, David McCoy, Dale Kutnick, Svetlana Sicular, Earl Perkins, Magnus Revang

Technology-based innovation arrives faster than most organizations can keep up with. Before one innovation is implemented, two others arrive. To cope, CIOs in end-user organizations must learn to develop an appropriate pace for digital change.

Key Findings

- Meeting goals for revenue generation and value creation will rely heavily on engaging and re-engaging people and businesses on how they will adopt and use technology.
- Trust in information will depend on who you *choose* to *listen* to rather than on validity of data sources.
- Speed of change will require variability of skills and capabilities to address rising challenges.

Recommendations

To build and expand a digital business, CIOs in end-user organizations must:

- Create new value scenarios by using people-centric technology options to find new ways to engage customers, employees and business partners.
- Formulate data verification initiatives to combat the spread of "counterfeit reality" and fake content.
- Advance their bimodal efforts by emphasizing the need for more people-centric and business-centric skills within their IT personnel.

Table of Contents

List of Figures

Strategic Planning Assumptions

By 2021, early adopter brands that redesign their websites to support visual and voice search will increase digital commerce revenue by 30%.

By 2020, five of the top seven digital giants will willfully "self-disrupt" to create their next leadership opportunity.

By year-end 2020, the banking industry will derive $1 billion in business value from the use of blockchain-based cryptocurrencies.

By 2022, most people in mature economies will consume more false information than true information.

Through 2020, AI-driven creation of "counterfeit reality," or fake, content will outpace AI's ability to detect it, fomenting digital distrust.

By 2021, more than 50% of enterprises will be spending more per annum on bots and chatbot creation than traditional mobile app development.

By 2021, 40% of IT staff will be versatilists holding multiple roles, most of which will be business-related rather than technology-related.

In 2020, AI becomes a positive net job motivator, creating 2.3 million jobs while only eliminating 1.8 million jobs.

By 2020, IoT technology will be in 95% of electronics for new product designs.

Through 2022, half of all security budgets for IoT will go to fault remediation, recalls and safety failures rather than protection.

Analysis

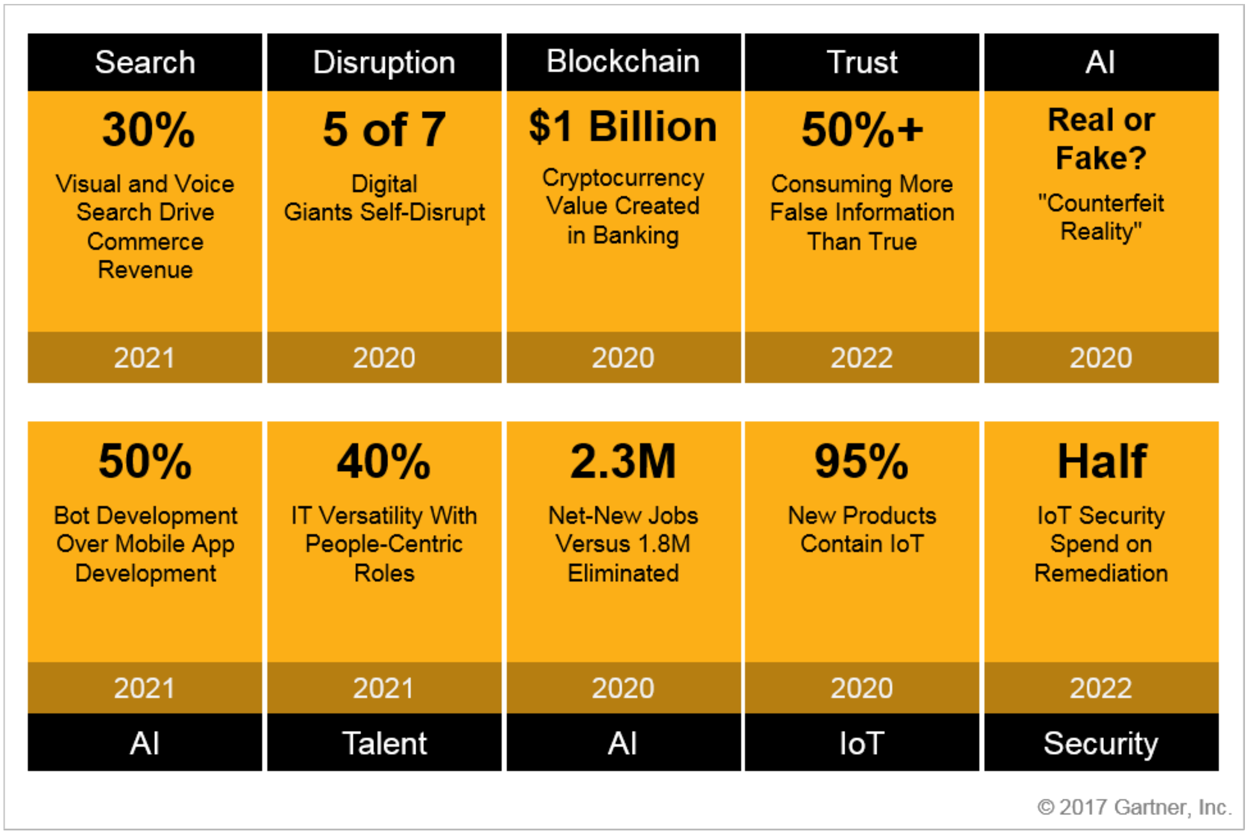
What You Need to Know

Gartner's top predictions for 2018 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. CIOs should leverage this document and:

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

The digital revolution continues to deposit new technology ideas on enterprises and consumers. While this is interesting for those seeking new capabilities, it is difficult for enterprises trying to stabilize themselves and their use of technology-driven solutions. Last year, we said that disruption has moved from an infrequent inconvenience to a consistent stream of change that is redefining markets and entire industries. Digital disruptions and straightforward trends show no sign of being reduced in frequency or impact. Instead, those who seek value from technology-based options must move faster as their bimodal IT efforts move into high gear. Figure 1 below provides an overview of the top 10 strategic predictions for 2018 and beyond.

Figure 1. Top 10 Strategic Predictions for 2018 and Beyond



AI = artificial intelligence; IoT = Internet of Things

Source: Gartner (September 2017)

Developing a Pace of Technology Innovation

The advance of technology is outpacing the ability of enterprises to keep up. In order to change that, CIOs in end-user organizations will need to develop a pace that can be sustained no matter what the future holds. Our predictions provide insight into that future, but enterprises will still be required to develop a discipline around how pace can be achieved. A good place to start is to review the way others develop pace.

Runners have multiple approaches to developing pace supporting long distance running and even sprints. There are parallels that can be drawn between enterprises and runners; they include:

- **Setting goals —** Runners set goals and advance those goals as they achieve each. As enterprises seek to embrace the advance of digital, they must set goals. These goals include modernizing and updating the existing technology base, experimenting with new capabilities as they arrive, and developing new skills appropriate to meeting the expectations of both customers and employees.

- **Starting from where they are —** Runners start from where they are. They avoid letting their dreams of proficiency override their understanding of what they can actually achieve. Proponents of digital will need to take a hard look at what they are prepared to undertake. Dreams of artificial intelligence (AI), blockchain or Internet of Things (IoT) proficiency will depend on making sure barriers to success are minimized. Our top predictions provide some insights into what timing will be most appropriate for these innovations to flourish.
- **Listening to their bodies —** Runners listen to how their bodies work and complain when overstressed. In that way, they can know when to push harder versus when to back off, rather than harm their chances to go the distance. Enterprises seeking to keep up with technological innovation will need to understand when those innovations are likely to cause more problems than they solve. Movements to data-centric approaches to tying devices and systems together at the scale of digital can lead to massive big data requirements. However, they can also lead to new security risks, information verification headaches and even intentional trust issues.
- **Varying their speeds —** Runners will adjust their speed to test how hard they should push in different situations. Once an optimal speed is found, they tend to settle into "the pocket" so they can sustain a competitive pace. Enterprises looking at the future of digital will rapidly discover that their pace will not be uniform across the entire company. Bimodal efforts will be sustained by sometimes avoiding the crawl, walk, run approach and embarking on a skip, hop and jump journey for some specific high-value scenarios. So while enterprise should be realistic, they must also seek opportunities identified in our predictions to accelerate into areas such as bot development through embracing a diverse culture and set of skills.

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.

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

- **Meeting goals for revenue generation and value creation will rely heavily on engaging and re-engaging people and businesses on how they will adopt and use technology.**

  One of the key notions of digital business is that digital assets, capabilities and channels can allow us to create new scenarios where we can mine value. Customers now enjoy the conveniences of modern technology use with capabilities such as voice interactions and visual search. Engaging through technology then presents itself as an opportunity for businesses to use digital capabilities to leverage that customer convenience. Technology-driven options such as cryptocurrencies and blockchain technology and the rise of AI mean business engagement will be increasingly based on technology interactions at the machine level.

- **Trust in information will depend on who you *choose* to *listen* to rather than on validity of data sources.**

  As it turns out, people like fake news. As the current political climate has exposed, the creation and consumption of content that is not verifiably true (or in most cases, is verifiably false) do not outrage people as much as one might imagine. This speaks to the idea that people prefer information that conforms to their belief systems or biases. As one could imagine, the use of information that is trustworthy only to the extent that it confirms our own biases will be a competitive nightmare for most enterprises.

- **Speed of change will require variability of skills and capabilities to address rising challenges.**

  Versatility will be the order of the day in the digital age. IT personnel will need more people-centric and business-centric skills that in the past. Digital technologies have an impact much closer to people and business goals than does traditional IT. This variability of skills will lead to better support for bimodal efforts and the introduction of new techniques and methods to the IT portfolio. For example, the introduction of bots, IoT and AI will require a larger percentage of data scientists than just programmers. As the needs change, the skills will change, and with the change will come better variability.

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

Strategic Planning Assumption: By 2021, early adopter brands that redesign their websites to support visual and voice search will increase digital commerce revenue by 30%.

Analysis by: Mike McGuire, Charles Golvin

Key Findings:

- Voice-based search queries are the fastest-growing mobile search type[1] and will be the dominant search mode for mobile users; Google's voice search currently (August 2017) supports 30 languages.[2]
- Major players such as Google, Bing, Pinterest, Facebook, Apple and many others are enabling visual search capabilities in their own apps and their partners' apps.
- Purchases made from a mobile browser or mobile app already account for as much as 50% of transactions for some online commerce sites, and this shift is accelerated by voice and visual search. U.K. online fashion and beauty site Asos, which enabled visual search on its app, has stated that 58% of its orders come from mobile devices.[3]
- Image sharing sites Pinterest and Instagram increasingly act as visual search starting points for commerce.

- AI firms such as Sentient Technologies improve commerce results using image recognition and machine learning, while companies such as Pinterest are applying visual search and machine learning to their platforms.

Near-Term Flags:

- By 2019, more than half of all mobile searches — as reported by major search engines such as Google and Bing — will be voice or visual searches, with mobile visual searches accounting for 20% of searches.
- By 2019, half of major commerce companies and retailers with online stores will have redesigned their commerce sites to accommodate voice searches and voice navigation.
- By 2019, most leading digital asset and product information management systems will implement features that allow brands to automatically expose tags and metadata in order to improve voice and visual search results.

Market Implications:

Voice- and visual-search-based queries improve marketers' understanding of consumers' interests and intent. Coupled with the additional contextual cues available from smartphones, early adopter brands and commerce sites will capitalize on consumers' shift to these search modalities. They will gain competitive advantage as measured in conversion rates, revenue growth, new customer acquisition, market share and customer satisfaction. Consumer demand for voice devices — embodied by products such as Amazon Echo and Google Home — is expected to generate $3.5 billion by 2021 (see "Forecast Snapshot: VPA-Enabled Wireless Speakers, Worldwide, 2016-2021"). These devices allow customers to affect a purchase with a single utterance; Echo Show could enable a similar experience via image recognition and Amazon's Firefly technology. Repeat and/or replenishment purchases will increasingly take place via these interfaces. Brands that are able to develop ways to leverage these systems (by building Alexa Skills or Google Home "actions" [skills and actions are essentially capabilities]) so that they can take a handoff, so to speak, from the devices will see rapid growth in digital commerce revenue.

As the convenience of voice and visual search shifts consumers' preferences to these modes, website and app designers, retailers, brand marketers and product marketing specialists will need to redesign their websites and mobile apps to optimize for these forms of search. Alphabet (Google) introduced Google Lens, a visual search tool for its Google Assistant application. Lens will enable users to retrieve information about what their smartphone's camera sees. For example, simply viewing a restaurant could show its business hours and menu options. Bing introduced a new visual search tool in June 2017, enabling users on a PC or mobile device to look for and identify items within a larger existing internet image, such as a product catalog.

Facebook is integrating voice-based interfaces into its core apps — Messenger and Instagram — and purchased Wit.ai in 2015 as a way to help Facebook developers integrate voice interfaces into their apps. Facebook is also pursuing visual search capabilities, launching a visual search chatbot from mode.ai for its Messenger app. The chatbot from mode.ai will enable Messenger users to identify items in their photos and then tell the user where the product might be available for purchase or present alternative products within the same category. The bot can also assist in upselling by recommending related items, such as accessories, that might be trending at online retailers such as Amazon or Louis Vuitton.

Apple's latest version of iOS (iOS 11) introduced the company's augmented reality SDK, ARKit, which enables brands to include visual-triggered interactions in their applications. While Apple has not included automatic image recognition in this release, app providers could extend their ARKit-enabled apps with this capability and ease brand marketers' ability to make their products discoverable to iOS devices.

Retailers are adding visual search and intelligence capabilities to their own sites and applications. Companies are applying AI in a number of marketing disciplines — Wylei uses AI and machine learning to deliver real-time assembly and optimization of content, while Sentient Technologies utilizes AI to enable online commerce vendors to provide tailored product recommendations.

Recommendations:

- Now is the time for marketing leaders with digital commerce responsibility to encourage experimentation. Marketing disciplines such as mobile and search marketing, customer experience (CX) and user experience (UX) should experiment with voice and visual search interfaces to understand how interaction models will change.
- CMOs must give their search marketing teams the resources and time to develop strategies to maintain balance between standard keyword taxonomies and the emerging requirement for addressing consumer searches spoken as questions or direct commands.
- Marketing leaders must create fresh customer journey maps that incorporate voice and visual search capabilities, addressing every phase of the buy/own/advocate cycle.
- Use new Near Field Communication (NFC)-based tags or quick response (QR) codes to enhance the targeted content delivery — beyond object identification — of visual search queries by consumers, even when they are not on your web page.

Related Research:

"Time to Build Your Plan for Scannable Marketing"

"Think Mobility — Not Mobile"

"Take Three Steps to Connect Physical and Digital Commerce"

Strategic Planning Assumption: By 2020, five of the top seven digital giants will willfully "self-disrupt" to create their next leadership opportunity.

Analysis by: David Mitchell Smith, Daryl Plummer

Key Findings:

- The top digital giants include companies such as Alibaba, Amazon, Apple, Baidu, Facebook, Google, Microsoft and Tencent.
- The digital giants have created market space by creating opportunities in areas that were not always significant before.
- Self-disruption involves seeing the possibility of a significant disruption and being proactive by deciding to embrace the disruption even if it cannibalizes some existing advantage before someone else does.
- Innovation and self-disruption have driven much of the disruptive efforts of the digital giants.
- Disruptive strategies do not need to be purely based on innovation. Self-disrupting approaches are successful as well.

Near-Term Flags:

By 2019, two or more digital giants will be more associated with a concept or offering that is different from what is associated with them today. Some potentials include:

- AWS Lambda versus traditional cloud virtual machines
- Alexa versus screen-based e-commerce
- Apple Face ID versus Touch ID

Market Implications:

The digital giants often create opportunities in market segments that were not significant prior to the giants driving them forward. This includes areas such as chatbots, conversational UX, participation-driven logistics (e.g., Amazon Flex), visual and voice search, and even digital advertising. In doing new things, digital giants are more likely to run into situations where their influence has grown so large that it is difficult to create new value scenarios where existing ones do not already exist. This ultimately leads to self-disruption.

Self-disruption is one of five models referred to as willful disruption — how businesses deliberately create challenges for their rivals or to create new opportunities in a market. The key implication of self-disruption is that there is no fear of cannibalizing existing revenue bases. While this may open the door for competitors to make up ground in an area where your company already dominates, in the end, those doors will close as the new capabilities push the old ones out of favor. For example, the introduction of the iPhone was a significant cause of the decline of markets for MP3 players — markets in which Apple held a significant lead with the iPod. The iPhone eclipsed MP3 players like the iPod while also limiting the opportunity for independent personal navigation systems, in-dash car navigation, digital camera usage, and a host of other functions.

In a self-disrupting strategy, the intent is to get there first — even if it is necessary to cannibalize your own previous success with a product or service. This can be risky in many ways, including in execution. However, risk of inaction can be even higher. For example, Research In Motion (currently known as BlackBerry) could have disrupted itself by delivering BlackBerry Messenger and the BlackBerry network to iPhones and Android phones. While it would have given up exclusive use of these capabilities — thus disrupting itself — Research In Motion would have created market space within competitive ecosystems to grow its influence rather than watching it decline.

Organizations disrupt in different ways, so we would not say that a particular organization is always self-disruptive. There are certainly tendencies of specific organizations to use one type of disruption over another, but it would be rare to see any organization disrupt in only one way or for any particular self-disruptive example not to cause other types of disruption as well. Just as with the iPhone, a self-disruption strategy can also be destructive to others.

The digital giants have a vested interest in innovation continuing to accelerate. It would be a bad sign if more traditional technology providers began to catch up with the giants. Therefore, leaders in the digital space must continuously seek to create new opportunities. Self-disruption, it would seem, is a top option for setting and resetting the landscape of innovation.

Recommendations:

- Leverage the lessons learned from the greatest disruptors by identifying the styles of disruptive intent that they use.
- Seek to understand what digital giants have done in their self-disrupting strategies, and plan to incorporate the lessons learned into best practices that can be emulated.
- Follow the money, but take into account the nuances exposed by understanding intent and the mode in which an organization is operating.
- Look beyond innovation; self-disruption and other strategies can drive disruption in business.
- Bring together representatives from enterprise architecture (EA), strategic planning, executive management and IT to focus on opportunities available as a result of self-disruption.

Related Research:

"Disruptions and Disruptors Are Reshaping the Digital Landscape"

"Disruption and Disruptors: Differentiating Disruption From Features and Fads"

"Measuring the Impacts of Digital Disruption: Introducing Gartner's Digital Disruption Scale"

"Dealing With Disruption: Collaborate With or Compete Against the Digital Giants"

"Willful Disruption: An Intent-Based Model for Analyzing Digital Disruption"

"Willful Disruption: The Many Ways Google Disrupts"

"Willful Disruption: Amazon Disrupts Through Scale, Richness and Reach"

"Four Ways Enterprise Architects Can Help Chief Strategy Officers Conquer Digital Disruptions"

"Enterprise Guide for Spotting Digital Disruptions and Disruptors"

Strategic Planning Assumption: By year-end 2020, the banking industry will derive $1 billion in business value from the use of blockchain-based cryptocurrencies.

Analysis by: Fabio Chesini, John-David Lovelock, David Furlonger, Dale Kutnick

Key Findings:

- The current combined value of cryptocurrencies in circulation worldwide is $155 billon (at time of writing), and this value has been increasing as tokens continue to proliferate and market interest grows.
- The business value derived by the banking industry from blockchain-based cryptocurrencies pales in comparison to the legitimacy afforded to blockchain by the banks' use of it.
- The exploitation of cryptocurrencies offers first-mover advantage, and cryptocurrencies will represent more than half of worldwide blockchain global business value-add through year-end 2023.

Near-Term Flags:

- By year-end 2018, formal investment frameworks will be available for trading in cryptocurrencies.
- By year-end 2018, at least one Tier 1 bank will offer cryptocurrency services (including some form of "counterparty" services to insure expected value).
- By year-end 2019, at least one Tier 1 bank will include cryptocurrencies in its asset portfolio.

Market Implications:

As per IHS Economics and Country Risk, the industry gross output of the world's banking industry is estimated at $7.6 trillion in 2020, and Gartner's estimate of $1 billion in accrued business value from blockchain-based cryptocurrency activity may seem negligible by comparison.

However, the market implications are significant, as the banking industry is tacitly endorsing cryptocurrencies as a legitimate alternative to store value and be a medium of exchange and/or a unit of account, thereby blunting the largest inhibitor to acceptance.

As a result, we expect digital forms of cash to achieve derived business value growth of more than 90% by year-end 2019 through cryptocurrency-based business models and supporting technologies.

We expect cryptocurrencies' usage growth will require every industry to rethink many aspects of current fiat-based business models, such as pricing of goods and services; accounting and tax methods; payment and transaction systems; and risk management capabilities. This will be necessary to accommodate these new forms of value in their business strategies. Also, by 2030, a first-mover advantage for businesses' use of digital cash will have evaporated, and exploitation of blockchain beyond cryptocurrencies (especially in supply chains, smart contracts, and personal health records) will realize more than 28.5% of the global blockchain-derived business value.

The regulatory treatment of cryptocurrencies and digital assets is evolving. The 2014 New York State BitLicense regulation[4] has now been complemented by Delaware legislation recognizing and legalizing bitcoin transactions for accounting and business records.[5] Similar developments have occurred in jurisdictions including France, the European Union, Gibraltar, Japan, Nigeria and Russia.[6] These actions provide increasing levels of formal recognition for cryptocurrencies and their growing use in commercial activities (at present, predominantly speculative activities). China, on the other hand, seems to be heading in the opposite direction, tightening restrictions on cryptocurrencies and initial coin offerings (ICOs).

More than 900 cryptocurrencies currently exist in the market.[7] If all the various forms of cryptocurrencies, including digital assets in a blockchain, were converted into U.S. dollars, they would represent $155 billion,[8] and, at the time of this writing, with $74 billion (approximately 45% of the total market) belonging to bitcoin.

The total number of tokens entering the market is still increasing, often as the result of ICOs. At the same time, speculative interest is inflating token prices, increasing public and media attention, and also raising concerns about volatility and the legitimacy of their use as bona fide commercial instruments (especially with no legitimate counterparties for guaranteeing the value of transactions).

Complementary currencies[9] have long been contextualized for specific use cases (for example, economic development, time banks and gaming). But social scalability will remain problematic until there is more formal backing of specific schemes, and more reliability and usability in blockchain networks to convey trust. The banking industry's $1 billion in derived business value from blockchain-based cryptocurrencies in 2020 should afford that level of trust, and broader-based acceptance by all industries will follow.

Central banks are actively working on blockchain-based digital currencies[10] that may include issuing digital fiat currencies, or using all or some of the new capabilities of cryptocurrencies or the underlying blockchain technology. Nonetheless, we believe most central banks will not be supportive of cryptocurrencies' opacity for identifying specific users due to apprehensions about tracking money laundering and other illicit activities. By year-end 2022, at least one of the world's central banks will have blockchain-enabled digital money in its monetary system. But it is unclear whether these investigations will produce a significant change in monetary policies, though it is likely that other economic factors will encourage an overhaul of monetary policies (see "Central Banks' Digital Money Strategies: Why Bank CIOs Should Care, and What They Should Do").

CIOs should view these developments through three lenses that raise significant strategic planning questions:

- **Technological —** When will blockchain technologies mature sufficiently to accommodate formal, traditional economic activities?
- **Economic —** When will globalized standards and frameworks be developed that permit the fluid exchange of cryptocurrencies, fiat currencies, and digital and physical assets?
- **Customer —** When will customers readily accept and adopt cryptocurrencies as alternative mediums of exchange, stores of value and units of account that are natively digitally created and exchanged?

Gartner's "Hype Cycle for Blockchain Business, 2017" and "Hype Cycle for Blockchain Technologies, 2017" show that cryptocurrencies are more mature than the technical and business infrastructure that supports them. This is, in part, due to the lack of credibility that tokenized developments have received from mainstream businesses. But as banks view cryptocurrencies and digital assets in the same context as more traditional financial instruments,[11] more "distributed" business value will begin to accrue. This growth in value will be compounded as corporations also begin to accept (directly or indirectly) cryptocurrencies as legitimate forms of payment.[12]

Recommendations:

- Engage legal counsels, chief financial officers (CFOs) and chief risk officers to begin developing strategies that will respond to broader market acceptance/adoption of cryptocurrencies and the resulting implications for enterprises' risk, exchange media and accounting policies.
- Perform gap analyses of core systems, especially corporate treasury and related accounting and payment applications, to ensure their interoperability with cryptocurrencies.
- Solicit enterprise treasury teams to assess financial (partner) institutions' cryptocurrency adoption plans and their implications for bank-to-corporate treasury needs.
- Work with product managers and customer service executives to model potential implications for pricing changes and customer adoption rates for products priced in cryptocurrencies.
- Conduct an interoperability impact analysis for managing cryptocurrencies and digital assets to determine the gap with existing legacy accounting systems, as well as integration requirements and costs.
- Include cryptocurrencies and digital assets usage in digital strategies by doing scenario planning based on the growing market awareness.
- Establish a task force with the lines of businesses, legal and compliance departments to prioritize digital business IT transformation needs in preparation for cryptocurrency exploitation.

Related Research:

"Forecast: Blockchain Business Value, Worldwide, 2017-2030"

"Central Banks' Digital Money Strategies: Why Bank CIOs Should Care, and What They Should Do"

"Hype Cycle for Blockchain Business, 2017"

"Hype Cycle for Blockchain Technologies, 2017"

"Cool Vendors in Blockchain Applications, 2017"

Strategic Planning Assumption: By 2022, most people in mature economies will consume more false information than true information.

Analysis by: Magnus Revang, Whit Andrews

Key Findings:

- Confirmation bias, a well-known human tendency, leads all people to seek out, select and value information that parallels what they believe and expect to be proven true.
- AI can detect false information. It can also be used to generate it. AI applications will compete such that quality of detection and generation improve with time.
- Creating false information will always cost less in currency and effort than the cost of detecting it. False information will consequently outpace true information where there is economic or political interest to purvey it.

Near-Term Flags:

- Before 2020, untrue information will fuel a major financial fraud made possible through high-quality falsehoods moving the financial markets worldwide.
- Through 2020, no large internet company will fully succeed in its attempts to mitigate this problem.
- By 2020, a major country will pass regulations or laws seeking to curb the spread of false information.

Market Implications:

A major theme for 2017 in politics and media worldwide has been the issue of the creation of "fake news," from the use of the term to discredit true information to its proper use to describe wholly false information, with many stops along a spectrum in between. Gartner introduced the term "counterfeit reality" in 2004 to describe the much broader phenomenon of digitally-created content for good as well as for ill (e.g., entertainment such as digital actors in movies, photographic, textual and audio content). While fake news is currently in the public consciousness, it is important to realize the extent of digitally created content that is not a factual or authentic representation of information goes well beyond the news aspect (see Strategic Planning Assumption No. 5 below).

Without taking any *political* position on what currently constitutes true or false information, we can say society faces a profound challenge in that different media sources report vastly different facts and perspectives on the same event. Further, we know that false information as a "first perception," especially when collectively endorsed, can persist in subcultures long after it has been roundly debunked.

Even trying to correct the misinformation can make the misunderstanding worse. "Corrections that merely encourage people to consider the opposite of initial information often inadvertently strengthen the misinformation. Therefore, offering a well argued, detailed debunking message appears to be necessary to reduce misinformation persistence."[13]

A future where people can elect to live in a global subreality they would like — regardless of that reality actually aligning with fact — and have support for that belief in the information they consume and media they are exposed to is a very new phenomenon. In the digital world, anybody can look credible. "Spoof" websites with real impacts from those who fail to get the "joke" date back 20 years. Fake news follows in the footsteps of "The Protocols of the Elders of Zion," a thoroughly untrue document published to appear true; the document has been used, and is still used, as a foundation for anti-Semitism.

For enterprises, this acceleration of content in a social media-dominated discourse — of which much will be falsehoods — presents a real problem. Enterprises need not only to monitor closely what is being said about their brands directly, but also in what context, as to not be associated with content that is detrimental to their brand value. They must also avoid establishing partnerships (or eschewing them) based on intentionally-spread misinformation. And they must defend their brands and those of their partners against conscious attacks. Disinformation does not deserve the protection of "just business; nothing personal."

Ultimately, brands that have diligently worked to cultivate unique and recognizable behaviors and values will generally prevail, being much more resistant to any effort of undermining. Enterprises that choose not to participate in short-term manipulation of truth and persist on preserving their trustworthiness will win in the long term. The greatest risk for effective malfeasance will lie in areas where technological fealty is based more in emotion than in fact already — for example, the so-called "religious wars" around competing mature platforms and ecosystems.

Enterprises that need to reach people with their message must learn to tailor these messages in multiple ways to penetrate different alternate reality bubbles.

Recommendations:

- Protect the trust in your brand by adopting a digital ethics strategy.
- Monitor information diligently — false information might be about your brand — and draft and update strategies for swift reaction.
- Respond without recapitulating the falsehoods, as that reinforces them. Instead, present the truthful narrative to replace the lie in recipients' brains.
- Do not fund any activity that rewards the creation of false information.
- Invest in the training of your employees to ensure they are inclined and skilled to discern the truth — it will be a competitive advantage for decision making.

Related Research:

"Use a Digital Trust Index to Maximize Digital Business Performance"

Strategic Planning Assumption: Through 2020, AI-driven creation of "counterfeit reality," or fake, content will outpace AI's ability to detect it, fomenting digital distrust.

Analysis by: Daryl Plummer, David McCoy

Key Findings:

- The creation of multiple types of content (e.g., entertainment, corporate, political, documentary, news, etc.) that is not real is beginning to exceed human ability, or will, to verify its authenticity.
- AI systems have the ability to categorize the content of images faster and more consistently accurate than humans, but is not applied to the problem often enough.
- Neural network generation of counterfeit reality "fake" video news is the next near-term frontier.
- Creation of counterfeit images to de-age actors in movies (even from death) occurs in 90%+ of the biggest movie releases each year.

Near-Term Flags:

- In 2018, a counterfeit video used in a satirical context will begin a public debate once accepted as real by one or both sides of the political spectrum.
- By 2018, there will be a 10-fold increase in commercial projects to detect fake news.

Market Implications:

"Counterfeit reality" is the digital creation of images, video, documents or sounds that are convincingly realistic representations of things that never occurred or never existed exactly as represented.

The historical tendency of business and government entities has long been to accept data as valid points of information that can further common understanding and acceptance of beliefs and practices. However, in the past 30 years, the ability to create and to disseminate content that has been subtly or overtly altered has increased by orders of magnitude. Massive numbers of people having access to the internet with few controls on content distribution meant that this was an inevitable outcome. Now comes the next wave of that distribution — machine-generated content.

As neural networks and AI have progressed, they have reached a point where they can successfully categorize image content at least as well as human beings. However, they can do it significantly faster. Alongside this, the use of computer-generated imagery has progressed with the help of the entertainment industry (movies, games, etc.) to a point where the convincing realism of human beings is now commonplace. Further, the proliferation of the concept of fake news (i.e., intentionally designed to misrepresent the truth) as a political football has focused many on the proliferation of propaganda and downright corrosive content through wildly popular social sites. These sites have now embarked on efforts to detect and minimize the spread of fake content. Much of this is destined to fail, but the effort will not be in vain.

The detection of counterfeit reality will best be accomplished by AI that is able to identify and track markers in counterfeit content faster than human reviewers. The process of detecting counterfeit content will be applied to fake news as often as it is to video and audio content that can present a threat to corporate brands and reputation. Unfortunately, application of AI to the problem of detecting counterfeit reality lags behind the use of AI to create it.

The creation of counterfeit reality has accelerated using AI techniques in recent years with multiple universities and research organizations creating compelling, yet completely inauthentic video representations of famous people speaking things that were never said.[14] Computer mapping of facial expressions as well as body language using neural networks have been paired with mimicking technology to map one person's facial motions onto another.[15]

For these reasons, among others, counterfeit reality creation and detection are increasingly becoming a perfect fit for AI-based methods.

Market effects that continue to grow are:

- Corporate branding and reputation are at stake due to counterfeited delivery of messages or contract-related terms and conditions.
- Political impact of video and images will escalate as actors move beyond faked textual content to content that misrepresents anything, from individual actions to speeches before important audiences.
- Representation of video, audio and documents in a legal context will need new laws to be reviewed in order to combat the evolution of counterfeit reality.
- Entertainment, from movie production to video games, will continue to lead the way in counterfeit reality creations.
- Social media giants will lead in combating/detecting counterfeit content for the purposes of accuracy, authenticity and even rapid removal of inappropriate video content.
- Counterfeit reality detection as a business will enable new companies to market their expertise in order to protect corporate, political, individual or legal entities much as identity theft protection has done.

Recommendations:

- Do not underestimate the number of counterfeit reality sources that exist in the world today.
- Tier your content decisions to place the highest level of "anti-counterfeiting" scrutiny on the most critical content you produce and rely upon, whether internally or externally created.
- Extend the ability for AI to create valuable content in parallel to using AI to verify content authenticity in corporate and government contexts.

- Use machine-generation platforms, such as the narrative science Quill platform, to leverage AI-generated content.
- Track the progress of social giants and universities in detecting and generating convincing counterfeit reality.

Related Research:

"Market Insight: Creative AI — Assisted and Generative Content Creation"

"Four Ways to Get More Value From Data Visualization"

Strategic Planning Assumption: By 2021, more than 50% of enterprises will be spending more per annum on bots and chatbot creation than traditional mobile app development.

Analysis by: Adrian Leow

Key Findings:

- The market for bots and chatbots has gained huge traction in the past few years with nearly 300 bot-related companies attracting a combined $24 billion in funding.[16] Key bot-related areas of opportunity that have attracted significant funding include messaging platforms, AI tools, virtual assistants, bot discovery, and virtual agents and analytics.
- In a recent Gartner survey on enterprise mobile app development, 52% of the respondents indicated they are doing something about bots, chatbots and virtual assistants (VAs). Of this group, most are just investigating at this point, but 16% have begun to test the technologies, and 7% either have a pilot program underway or have actually deployed these technologies.
- From the same Gartner survey on enterprise mobile apps, any urgency to scale up mobile app development does not yet appear to be a priority for most organizations. The evidence indicates that enterprises are lagging behind in starting to develop mobile apps with surprisingly small portfolios of mobile apps (on average, eight mobile apps, inclusive of packaged configurable apps and custom-built apps).
- Users are looking for better ways to do tasks effectively in a nonsiloed way and are increasingly looking for apps that can offer a multitude of services within the app itself (without having to leave the app). This supports the move toward VAs and bots, and ultimately the post-app era. Gartner's consumer apps survey showed that 35% of survey respondents in the U.S. and U.K. actively used VAs such as Google Now, Siri or Cortana in 2016. This is up 4% from 2015.
- Advancements in natural-language processing (NLP) make today's chatbots much better at recognizing the user intent than previous generations. NLP is used to determine the entry point for the decision tree in a chatbot, but a majority of chatbots still use scripted responses in a decision tree.
- The availability of multiple open-source bot frameworks will lead to a proliferation of readily available chatbots that can be used in the business.

Near-Term Flags:

- Through 2018, a majority of bots created will still be regarded as trivial "junkbots," but a handful of transformative bots will emerge by year-end that highlights the transformative potential of bots.
- In 2020, more bots and chatbots will be built and deployed across the globe than new mobile apps that year.
- By 2020, 55% of all large enterprises will have deployed (used in production) at least one bot or chatbot.

Market Implications:

For the past few years, respondents to Gartner's survey on enterprise mobile app development have indicated that they will increase their mobile app development budget spend, but in reality that spending allocation has decreased, even falling between fiscal 2015 and fiscal 2016 rather than increasing. At the same time, user attention is shifting away from individual apps on mobile devices and splintering across emerging post-app technologies such as bots and chatbots. When Gartner refers to the "post-app era," we do not mean one in which apps will fade away. On the contrary, mobile apps will be relevant for the foreseeable future. But the traditional app — obtained from a platform app store and installed on a mobile device — will become just one of a wide range of ways in which functionality and services will be delivered to mobile users.

Users must first understand the distinction between bots and chatbots and how they complement each other. A chatbot is a stand-alone conversational interface that uses an app, messaging platform, social network or chat solution for its conversations. A chatbot can use a decision tree of choices, and be text- or voice-based, or a combination. Bots, on the other hand, are microservices or apps that can operate on other bots, apps or services in response to event triggers or user requests. These requests can be initiated via conversational UIs (chatbots) or in response to events. Bots automate tasks based on predefined rules or via more sophisticated algorithms, which may involve AI.

As it stands, chatbots are the face of AI and will impact all areas where there is communication between humans today; this includes customer service, in which chatbots are redefining the number of service agents that organizations require to the standard of service delivered. For chatbots as application interfaces, the change from "the user having to learn the interface" to "the chatbot is learning what the user wants" has significant implications for onboarding, training, productivity and efficiency inside the workplace.

Bots have the ability to transform the way apps themselves are built. A shift to event-driven programming models, facilitated by the use of bots, has the potential to change the way that users interact with technology. The appropriate use of bots is also likely to increase employee or customer engagement; the bots can quickly automate tasks to free up the workforce for more nonstandard work, including question-and-answer interactions when the bots are deployed as chatbots or virtual assistants. The diversity and growth in use of these technologies mean that "conversation" is the next user interface that will dominate applications and services, which organizations will need to plan to support if they are not already doing so.

Recommendations:

- Deploy at least one bot framework internally, and begin to actively develop bots to assess their use in the enterprise, focusing on the current pain points in the use of business applications.
- Organizations should not implement natural-language processing (NLP) on its own; instead, they should use a hosted NLP service and supplement it with domain-specific data as needed.
- Initial chatbot implementations must focus on fast time to value and the ability to adapt over time, as tools to support chatbot delivery are evolving and maturing rapidly.
- Choose vendors tactically through 2018, as the rapid pace of maturation in conversational technologies currently precludes making strategic choices.

Related Research:

"Survey Analysis: The Mobile App Development Trends That Will Impact Your Enterprise in 2017"

"User Survey Analysis: Mobile Apps, U.S., U.K. and China, 2016"

"Hype Cycle for Mobile Applications and Development, 2017"

"Four Use Cases for Chatbots in the Enterprise Now"

"Cool Vendors in Consumer Mobile Applications and Bots, 2017"

"Architecture of Conversational Platforms"

"Market Guide for Virtual Customer Assistants"

"Architecting and Integrating Chatbots and Conversational User Experiences"

Strategic Planning Assumption: By 2021, 40% of IT staff will be versatilists holding multiple roles, most of which will be business-related rather than technology-related.

Analysis by: Hank Marquis

Key Findings:

- Organizations scaling bimodal for digital business define versatilists' profiles as critical to success, with the largest increase of versatilists expected to be in IT leadership and management ranks.
- The rise in need for IT versatilists will mirror bimodal/digital business adoption phases, as more organizations enter scale and synthesize phases, the need for versatilists will peak.

- Two-thirds of organizations are not addressing IT skill gaps in a manner that will mature their digital business initiatives.
- People-centric roles and experience are a critical difference that will aid digital business transformation initiatives.
- Many CIOs think digital is all about new technologies, whereas in truth, new digital technologies will aid people, making our work and personal lives easier, more convenient and more efficient.

Near-Term Flags:

- By 2019, IT technical specialist hires will fall by more than 5%.
- Half of enterprises will formalize IT versatilist profiles and job descriptions.
- Over half of IT job searches will be for IT versatilists.
- Twenty percent of IT organizations will hire versatilists to scale digital business.
- IT technical specialist employees will fall to 75% of 2017 levels.

Market Implications:

Specialists are the most represented IT professional profile in today's IT organization, representing about 42% of the entire IT workforce in 2017. However, bimodal and digital business initiatives depend on wholesale skill transformation, as profound a change as moving from mainframe to distributed computing was.

This shift will originate first in infrastructure and operations (I&O). With the need for I&O platforms (hyperconverged and software-defined infrastructure, storage and networking) that can support on-demand (cloud scale) infrastructure, I&O versatilists aligned to business groups will surface. With a solid technical (I&O) foundation in place, an increase in nontechnical IT managers and leaders with the versatilist profile will follow. After the leadership wave, marketing-oriented digital business efforts such as business intelligence (BI) will be next, followed by versatilists in software development, digital product management, project/program/portfolio management, customer experience management and architecture.

These waves of change, starting with I&O and culminating full circle with architecture, will occur with the scale-out of digital business to business as usual. Increasing marketing impacts include:

- Success at bimodal and digital business initiatives depend on wholesale skill transformation, something most CIOs are not considering.
- Colleges, universities and technical schools will need to radically change IT specializations to become versatilists.
- Military forces will need to change recruiting profiles and technical training.

- Human capital management (HCM) costs will increase in the short term, as those with the skills demand higher wages and as more enterprises begin to scale the competition for IT versatilists with experience in digital business, creating a hiring war.
- Turnover of existing IT staff will increase as IT leaders bring in versatilists in an effort to scale — taking career opportunities away from those IT workers who have not been given sufficient career guidance.

Recommendations:

IT and HCM leaders at all levels must:

- Align your bimodal scaling strategy with development of versatilist profiles by understanding your CEO's growth ambition and digital business posture.
- Build versatilist capabilities across and between modes by creating and implementing a plan for fundamental talent profile transformation.
- Determine when and where to make critical investments in versatilists by leading the versatilist conversation with business and HR leaders.
- Build a portfolio of sources for versatilist talent now by working with HR and external HCM sourcing firms.
- Determine the mix of specialist and versatilist profiles required to fill critical roles on planned multidisciplinary product teams by evaluating peer organizations that are more mature in their digital business efforts.
- Build staff talent to create versatilists by using virtual multidisciplinary teams and allowing the autonomy for them to turn into mature self-organizing teams.

Related Research:

"Build I&O Staff Talent to Support Bimodal, DevOps and Cloud"

"Organize I&O for Cloud Infrastructure as a Service"

"How to Be a Successful I&O Leader in the Era of Digital Business"

"Assess Your IT Bench Strength for Digital Business Transformation"

"CIOs Must Evolve IT Roles and Talent Profiles to Adopt and Scale Bimodal"

"Bold Steps CIOs Can Take to Extend Expertise, Skills and Performance Without Hiring"

"CIOs, Make Changes to IT Skill Development to Succeed in Digital Business"

Strategic Planning Assumption: In 2020, AI becomes a positive net job motivator, creating 2.3 million jobs while only eliminating 1.8 million jobs.

Analysis by: Svetlana Sicular, John-David Lovelock

Key Findings:

- AI-enabled decision support is the greatest contributor to business value creation, overshadowing AI process automation throughout the entire forecast period from 2015 through 2025 globally.
- 2020 is the pivotal year in AI jobs dynamics: AI will eliminate more jobs than it created through 2019 (mostly in manufacturing). Starting in 2020, AI-related job creation will cross into positive territory, reaching 2 million net-new jobs in 2025.
- The number of jobs affected by AI varies by industry: healthcare, public sector and education will see continuously growing job demand; manufacturing will be hit the hardest.

Near-Term Flags:

- Healthcare providers, public sector, banking and securities, communications, media and services, retail and wholesale trade will benefit from AI without ever suffering annual net job loss.
- Manufacturing and transportation are disproportionally big contributors to job losses: 938,000 manufacturing jobs will be eliminated due to AI by year-end 2019. The transportation industry will see net job growth from AI for the first time in 2020.
- Global IT services firms will have massive job churn in 2018, adding 100,000 jobs and dropping 80,000.

Market Implications:

Gartner is confident about the positive effect of AI on jobs. The main contributor to the net job growth is AI augmentation — a combination of the human and artificial intelligence, where both complement each other. AI effects on jobs are at their earliest stage globally. To predict how and where AI will change the job landscape, we looked at where and how business value is created, by industry, by country, over a 10-year span, from 2015 through 2025.

We can predict with confidence the employment dynamics up to 2025. Beyond 2025, new industries and job roles will be created, but they are hard to foresee; like in the past, it was hard to foresee smartphones, social networks and adtech. We can tell for sure that AI-related jobs will steadily grow starting in 2020. In 2021, AI augmentation will generate $2.9 trillion in business value and recover 6.2 billion hours of worker productivity. In the long term, AI will reduce labor cost as a percentage of revenue, but a portion of that revenue will keep translating into new jobs, albeit different jobs that command a higher salary than those that have been obsoleted.

A single answer about the AI influence on job losses and gains does not cover the entire picture. All industries will experience varying levels of time and effort savings. Just a few industries will incur overall job loss, some industries will see net job loss for only a few years, and most industries will never experience net job loss at all.

Today, a wide range of companies have begun their AI initiatives. Vendors rapidly introduce new AI features in existing products. Capital investments lead to tremendous proliferation of AI startups. The AI hype is new, but AI is not. AI has already had proven results in anomaly detection, cybersecurity, securities trading, medical diagnostics, customer satisfaction, DNA sequences classification and many more cases. Despite such richness of the AI scope, most dire warnings of job losses confuse AI and automation. Automation has driven productivity and returns on capital and on labor all the way back 200 years.

Unfortunately, debates about automation overshadow the greatest AI benefit — augmentation of humans with AI for decision support. Stitch Fix, a personalized shopping company, is an example of the symbiosis of people and AI. Stitch Fix uses AI to narrow down a huge merchandise selection from the market to fit customer preferences, and leaves the final choice of items and personal touch to human designers. Stitch Fix created jobs not only for 65 data scientists, but also for thousands of designers. The company had revenue of $730 million in fiscal 2016, and Fortune reported Stitch Fix's 2017 IPO to be worth between $3 billion and $4 billion.[17]

The AI effects on jobs differ year by year. In 2018, AI will lead to $200 billion in new revenue and 768,000 new positions. In the same year, 2.8 billion hours of work effort will already been recovered globally. In most cases, savings and efficiencies of AI mean improved productivity of the job. While recovery does not always translate into job loss, 943,000 jobs will be eliminated in 2018. Job loss is predominantly in the middle-skilled jobs — typified by jobs where the training is received "on the job." Low-end and low-skilled jobs will see some churn, but will fare better.

AI-prompted employee churn is a new reality. AI will improve the productivity of many jobs, it will eliminate millions of middle-level and low-level positions, and it will create millions more new positions of highly skilled positions, management and even the entry-level and low-skilled variety.

Recommendations:

- Now is the time to impact the long-term AI direction. For the greatest value, focus on augmenting people with AI. We are at the pivotal point: Where will AI go? This is up to you — you will choose the problems for AI to solve. We say: Enrich people's jobs, reimagine old tasks, and create new industries. AI can handle patterns it has already seen, and humans break new ground.
- Transition to continuous learning. To reduce employee churn and sustain growth, transform from episodic or nonexistent learning to continuous learning. Upskill employees to maximize the effects of AI-enabled roles and decisions.
- Transform your culture to make it rapidly adaptable to AI-related opportunities or threats. AI will be taking away routine tasks, freeing up employees to be more productive and creative by doing what humans can do best. Invest in reinforcing agility, soft skills and creative innovative attributes that will be needed in the symbiotic culture of people and AI.

Related Research:

"Augmented Analytics Is the Future of Data and Analytics"

"Wealth Management CIOs Deploy AI to Create Amazing Insights by Augmenting Human Intelligence"

"Digital Humanism Requires an Agile Culture"

"Shape the Future of Customer Experience With Customer Analytics"

"Information as a Second Language: Enabling Data Literacy for Digital Society"

Strategic Planning Assumption: By 2020, IoT technology will be in 95% of electronics for new product designs.

Analysis by: Al Velosa, Martin Reynolds

Key Findings:

IoT projects can deliver a return on investment in as little as four months. These savings come mostly from managing maintenance costs. IoT devices can indicate when they need service and even adjust their load to extend the useful life of a deteriorating component. IoT also offers revenue benefits by providing users with value-added features and services. For example, an IoT-enabled coffee maker could optimize temperature and timing for a particular blend of coffee, delivering the promise of superior flavor.

These features require a microprocessor and Wi-Fi interface, along with the necessary software to securely implement the IoT features. A strong candidate for IoT implementation comes from the Chinese semiconductor company Espressif Systems. Espressif makes a single-chip Wi-Fi interface that also has a small 80MHz microcontroller. This device runs the 802.11b wireless system, and has spare compute capacity to implement basic security and operational functions. This chip is available in a postage stamp-sized module that can easily be added to any electronic board design. The key here is that the entire subsystem costs less than $2, even in small volumes.

The device is so economical that it makes sense to implement it in any device that could possibly use IoT in such a fashion that it can be enabled by software, most likely via a smartphone app. For example, with a 10% take rate, the break-even price for IoT enablement is only $20. This price can easily be covered in the first year with a service fee of less than $2 per month. There may be significant associated revenue benefits, as well as improved customer satisfaction that drives future revenue streams and customer loyalty. Electronics that are being influenced by IoT right now include:

- **Coffee maker —** Once enabled with a smartphone app, the coffee maker can download ideal brewing temperature profiles based on uploading an image of the coffee package using a smartphone. The result is improved coffee flavor, which drives a preference for coffee optimized for use with the machine. This coffee can carry a small premium.

- **Washing machine —** By scanning the label on a garment, the washing machine can download a wash profile optimized for that garment. Delicate silk fabric can be cleaned at home rather than at a professional cleaner. This method represents a material savings for the owner.
- **Air conditioner —** The unit can monitor the health and efficiency of the air conditioning unit, reporting operational parameters to the building administrator or a third-party manager. Maintenance moves to a need rather than a schedule, efficiency can be closely monitored in conjunction with airflow, and cooling can be phased across units to level the load. Savings appear in operating efficiency, reduced maintenance and a better environment.

The key is that these devices are so inexpensive that they can be deployed without certain knowledge of their use. There is a software burden, and security must have an active approach that is designed to render obvious threats ineffective. The initial challenge is ensuring that the devices cannot be enabled without a secure key exchange protocol. Once initialized, the devices must be secure against attack, which implies simple software with a very limited attack surface. The corollary to this is that the product intelligence must remain in the cloud.

Near-Term Flag:

- IoT-enabled products with smartphone activation emerging in the beginning of 2019.

Market Implications:

The combination of smartphone management, cloud control and inexpensive (ubiquitous) enabling modules delivers sophisticated monitoring, management and control with minimal additional cost in the target device. Once this technology emerges, buyers will rapidly gravitate to IoT-capable products, even if they do not plan to use the features immediately. Security will need to be deterministic: the device itself must be impenetrable, achieved with simple code; active and passive security is within the software; and there are carefully designed protocols that are resistant to attack. This approach is made far easier by moving most functions to the cloud, which makes the device software very simple. Once IoT-enabled products (which, to the user, appear smartphone-enabled) emerge, the interest and demand for the feature will snowball. Every supplier must at least make plans to implement this technology into its products for both consumer and business buyers.

Recommendations:

- Design IoT enablement into every electronics-enabled product.
- Build pricing based on a 10% take rate.
- Design for implicit and explicit security in the device, minimalizing functions so that most work is done in the cloud.

Related Research:

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

Strategic Planning Assumption: Through 2022, half of all security budgets for IoT will go to fault remediation, recalls and safety failures rather than protection.

Analysis by: Earl Perkins

Key Findings:

- Security budgets for organizations are changing as a result of IoT, but not as a particular category of spend known as "IoT."
- Current IoT security spend is estimated to be minimal as IoT initiatives continue to be deployed due to a lack of methods that adequately determine the risk and exposure IoT introduces in projects and initiatives.
- IoT spend is expected to increase sharply after 2020 following better methods of applying security patterns cross-industry in IoT security architecture, growing at more than 50% compound annual growth rate (CAGR) over current rates.
- Improvements in calculating and managing risk will contribute to security spend increases and to increased attacks on IoT-infused infrastructure and systems.
- The vast expansion of IoT technology into consumer, commercial and industrial markets will outpace the abilities of support systems such as change and patch management.
- Embedded IoT devices will experience increased breaches, which will result in recalls of components that cannot be patched via networks.
- The expanded use of IoT in environments where physical safety is paramount (e.g., automotive systems, building automation, industrial processes) will result in significant spending increases.

Near-Term Flags:

- The total IoT security market for products will reach $840.5 million by 2020, and a 24% CAGR for IoT security from 2013 through 2020 is expected.
- With the inclusion of IoT security services, safety systems and physical security, coupled with attacks and failures, explosive growth is expected, exceeding more than $5 billion by year-end 2020.

Market Implications:

The definition of IoT security is evolving to become the products, technologies, services and practices used to ensure IoT-infused projects and initiatives are protected.

Risks directly and indirectly related to the introduction of IoT as part of projects or initiatives can be different from IT-only risks and must be accommodated — that problem is still unresolved and evolving. Those risks are substantially impacted by the unintended consequences introduced when the "pervasive digital presence" is introduced across all industries and market sectors as IoT growth expands. This is particularly true when examining the impacts of IoT in industrial use cases involving production, operations and safety, in commercial use cases involving integration between physical systems and cybersystems, and in consumer use cases when introducing large volumes that require large, diverse networks and software updates across millions of devices.

The example of low-cost consumer devices is particularly compelling. The rapid expansion of the use of IoT in consumer environments introduces vast wireless networks of nomadic and non-nomadic devices that can be used by threat actors as a fertile "farm" for denial-of-service attacks on other networks. The requirement to update devices periodically as is done with mobile phones and other remote systems is multiplied by multiple factors, and the inability to perform those updates can result in massive product recalls.

For industrial environments, scale and diversity may not be as significant, but the need to preserve safety for individuals and environment and the rich regulatory regime that controls safety systems ensure that the rapid expansion of use of IoT in those systems will result in regulatory impacts for securing those systems. All of these factors result in sharp increases in products and services necessary to secure these systems.

Recommendations:

Risk and security managers, leaders and decision makers should:

- Identify the security patterns most consistent in their IoT-infused projects and initiatives.
- Modify risk management practices to incorporate production and operational risk factors with information technology factors for a complete view of risks.
- Assume there will be IoT security vulnerabilities requiring recall or remediation by shielding IoT with intrusion prevention in the absence of patches and replacements.
- Consider high-availability architecture deployments, providing the ability to continue operations while components are being replaced.

Related Research:

"Forecast: IoT Security, Worldwide, 2016"

"IoT's Challenges and Opportunities in 2017: A Gartner Trend Insight Report"

"Digital Business Mandates IoT Security Strategies"

"Market Trends: Grow Your IoT Security Business by Investing in Real-Time Discovery, Visibility and Control"

Gartner Recommended Reading

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

"What Is Gartner's Pace-Layered Application Strategy and Why Should You Use It?"

"Digital Trust — Redefining Trust for the Digital Era: A Gartner Trend Insight Report"

"2016 Strategic Roadmap for Digital Business Transformation"

"Develop the Competencies Your Workforce Needs for the Digital Ecosystem"

"Digital Workplace Program Primer for 2017"

Evidence

[1] G. Sterling. "Google Says 20% of Mobile Queries Are Voice Searches." Search Engine Land. 18 May 2016.

[2] M. Southern. "Google Voice Search Now Available to One Billion People Worldwide." Search Engine Journal. 14 August 2017.

[3] J. Young. "For U.K.-Based Asos, Mobile Drives a Surge in U.S. Sales." Digital Commerce 360. 5 April 2017.

[4] BitLicense Regulatory Framework. New York State Department of Financial Services.

[5] J. Althauser. "State of Delaware Governor Signs Blockchain Legislation." Cointelegraph. 25 July 2017.

[6] BitLegal

[7] "List of Cryptocurrencies." Wikipedia.

[8] CoinMarketCap

[9] "Online Database of Complementary Currency Systems Worldwide." Complementary Currency Resource Center.

[10] J. Chapman, R. Garratt, S. Hendry, A. McCormack and W. McMahon. "Project Jasper: Are Distributed Wholesale Payment Systems Feasible Yet?" Bank of Canada. June 2017.

[11] E. Cheng. "Bitcoin Just Got a Vote of Confidence From Switzerland's Legendary Banking System." CNBC. 12 July 2017.

[12] S. Williams. "Five Big Companies That Currently Accept Bitcoin." Business Insider. 9 July 2017.

[13] M.S. Chan, C.R. Jones, K. H. Jamieson, D. Albarracín. "Debunking: A Meta-Analysis of the Psychological Efficacy of Messages Countering Misinformation."

[14] K. Hao. "Researchers Have Figured Out How to Fake News Video With AI." Quartz. 19 July 2017.

[15] M. Niessner. "Face2Face: Real-Time Face Capture and Reenactment of RGB Videos." Stanford University.

[16] F. Gatti. "Bots Shift Towards AI and Garner $24 Billion of Investment." VentureBeat. 27 March 2017.

[17] C. Morris. "Stitch Fix Could Be Wall Street's Next Big IPO." Fortune. 31 July 2017.

More on This Topic

This is part of an in-depth collection of research. See the collection:

- Research Roundup: How to Grow an IT Services Business

GARTNER HEADQUARTERS

Corporate Headquarters
56 Top Gallant Road
Stamford, CT 06902-7700
USA
+1 203 964 0096

Regional Headquarters
AUSTRALIA
BRAZIL
JAPAN
UNITED KINGDOM

For a complete list of worldwide locations,
visit http://www.gartner.com/technology/about.jsp