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Technology in the mid-market
Closing the gap

A Deloitte Growth Enterprise Services report
November 2017

About the survey

From July 14 to July 24, 2017, a Deloitte survey of mid-market companies was conducted by OnResearch, a market research firm. The survey examined technology trends taking place in this market segment to determine the role that technology plays and how it influences business decisions.

The 500 survey respondents represented mid-market companies with annual revenues ranging from $100 million to a little over $1 billion. Half of the respondents were C-suite executives, while the remaining executives held other management roles. Seventy-nine percent of the respondents represented companies that are privately held, while the remainder were publicly-traded firms. Thirty-four percent of the respondents were from consumer and industrial products companies; 25 percent represented technology, media and telecommunications companies; the remainder were divided among energy and resources, financial services, life sciences and health care, and other industries.

The full survey results are included in a separate appendix; some percentages in the charts throughout this report may not add up to 100 percent due to rounding, or for questions where survey participants had the option to choose multiple responses.

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Executive summary

There's no sense waiting in line if you can start a new one.

Roger Nanney

Anthony Stephan

For decades, emerging challengers to leading businesses have tried to find ways to change the basis of competition rather than compete on the well-worn playing field. And, more often than not, the ones who have found success have turned to one common tool to chart their own course and redefine the game: technology.

For five years, this report has explored technology trends among mid-sized and private companies. We've explained why these companies often have lagged months or even years behind larger competitors in digitization efforts. In this year's survey, we see notable progress in the adoption of emerging technologies by mid-sized and private firms. There is compelling evidence that these companies are taking dramatic steps to not only deploy emerging technologies but also to eradicate the organizational barriers that once slowed their adoption.

Specifically, the survey results show:

- The respondents recognize that a wide spectrum of technology-related trends are producing productivity gains, and they are upping their IT budgets to capture them.

- A growing number of organizations see value in aligning business and technology requirements, and are accomplishing this by exploring governance practices.

- Companies cite stronger collaboration between IT and business leaders when it comes to managing the IT agenda, a nod to shifting dynamics in the C-suite.

- Analytics and cloud solutions remain at the top of the list, but a vast majority of companies surveyed have plans to tap breakthrough technologies such as blockchain, machine intelligence, and mixed reality.

- The companies are more comfortable maintaining security around cloud integration and mobility, removing a key obstacle to their deployment.

- These companies are increasingly focused on using breakthrough technologies to attract customers and understand their behavior.

The middle market's growing sophistication with digital technologies is not confined to any particular sector. In the pages that follow, you'll read about upstart media companies that are big players in the film and TV business thanks to the digital transformation of the entertainment industry; engineering firms using geospatial technology and satellite data to map water pipelines and make better decisions about construction projects; and drug companies turning to the cloud to expand their presence outside the domestic market in a short matter of months.

These encouraging stories are just a few of those being written—and rewritten— by technological advances. We've grown accustomed to the speed and agility at which mid-market technology leaders are moving these days, but we believe it's worth drawing attention to the movers and shakers that are creating a template for other companies to follow. And we look forward to watching the middle market's maturation continue as the next generation of game-changing technologies finds its way into our homes and businesses.

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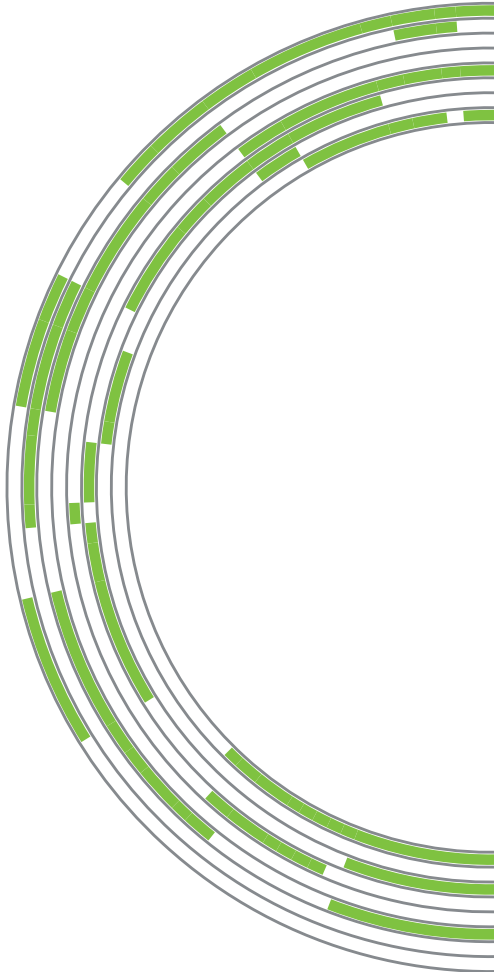
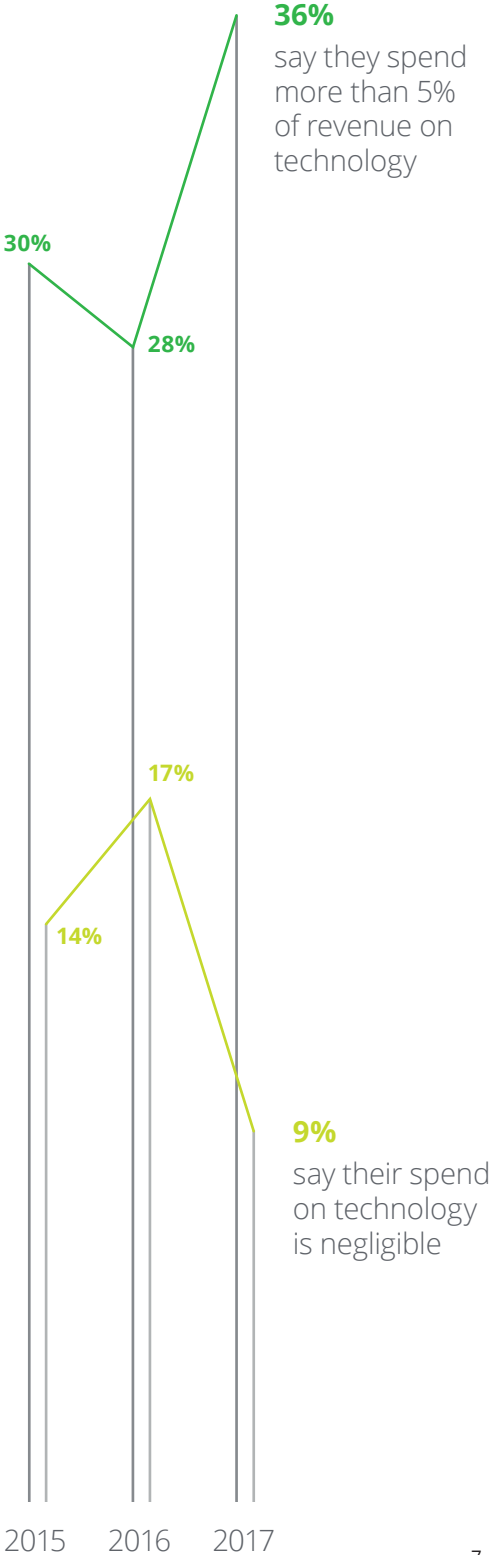# Transforming behind the scenes

The nation's private and mid-sized firms are sporting an upgrade

The nation's private and mid-sized firms are sporting an upgrade. If digital operations are the businesses' showrooms, these companies are boasting brand new models that are better handling, superior in performance, and adaptable enough to keep up with the twists of emerging technology.

This year's survey reveals that private firms are demonstrating more convincingly than ever that they can compete with larger peers. The story comes alive across diverse industries and the types of technology investments companies are making and setting in place. Private firms are taking on the $1 trillion construction industry, using automation and robotics to build modular towers that challenge convention, complexity and cost.[1] Media upstarts are using digital technologies to forgo building production facilities, granting them immediate heft to take on the big studios. Biopharmaceutical companies are leveraging the cloud to expand their reach to overseas markets.
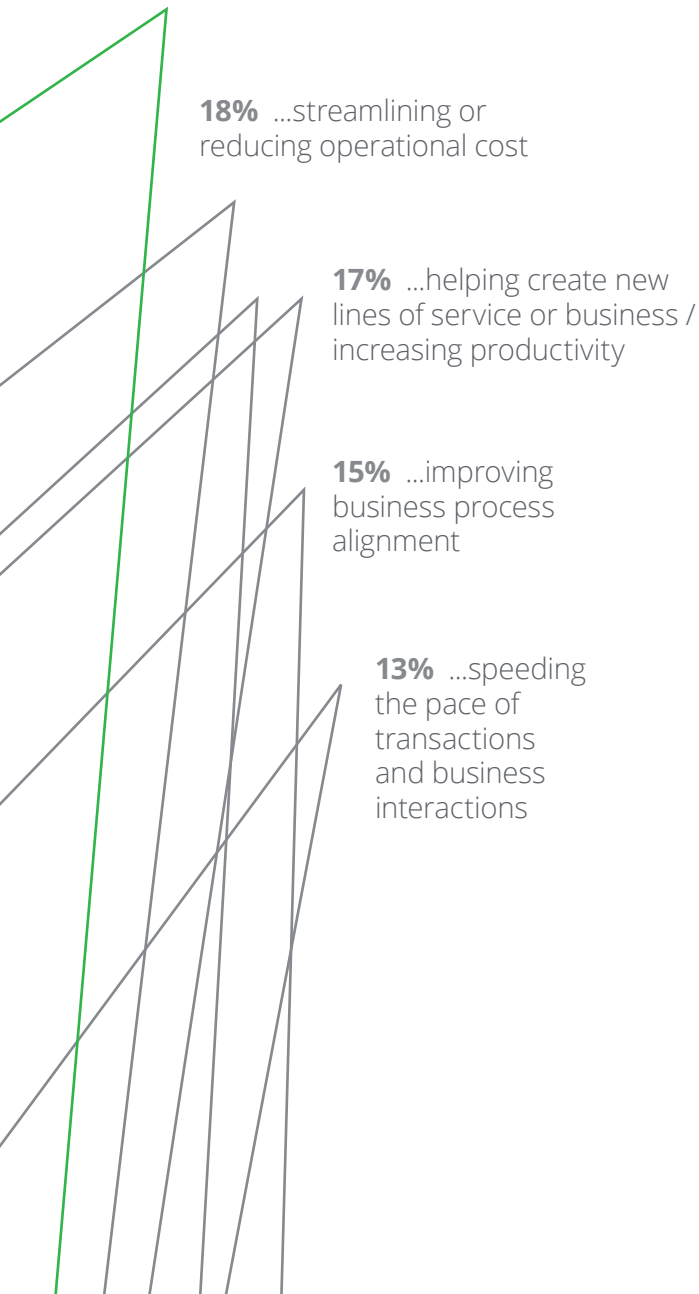
Technology budgets are growing to fuel these efforts. In the five years we have been conducting this survey, we have seen a marked and steady increase in the budget and resources that respondent companies are allocating to technology investments. This year that level reached a new high water mark, with more than a third now spending more than 5 percent of their revenue on technology and half spending between 1 percent and 5 percent. Furthermore, less than one out of every 10 companies considers their spending on technology to be "negligible."

Overall, 69 percent of respondents say their companies' IT spend is "higher" or "significantly higher" than last year.

36%
say they spend more than 5% of revenue on technology

30%

28%

17%

14%

9%
say their spend on technology is negligible

2015   2016   2017

20%
report that the most significant impact of digital disruption over the next 12 months will be its enabling of new ways to interact with customers

18% ...streamlining or reducing operational cost

17% ...helping create new lines of service or business / increasing productivity

15% ...improving business process alignment

13% ...speeding the pace of transactions and business interactions

The additional funds are being earmarked for a wide array of purposes. Enabling new ways to interact with customers tops the respondents' list when asked how digital technologies are most likely to disrupt their organization over the coming 12 months. But other impacts aren't far behind. The respondents believe these innovations will be nearly as significant for streamlining or reducing operational costs, helping to create new lines of services or businesses, increasing the productivity of their workers, improving the alignment of business processes, and speeding the pace of transactions and business interactions.

One common thread running through these projected impacts is technology as a productivity kick-starter. Total US economic output per worker has essentially been flat for the past four decades, and private and mid-sized companies are turning to technology to beat this trend. Specifically, respondents point to big data, cloud integration, and information security as technology trends with the highest probability for boosting productivity.

"It's arguable that digital technologies are helping small companies even more than big companies," says Gerald Cohen, president and chief executive officer of Information Builders, a New York-based provider of business intelligence solutions. "I see all kinds of great smaller businesses out there using business intelligence to increase their business value or do new things and they are often more agile than the big companies in putting these solutions to work. There are lots of smaller companies doing really nifty things and forming new kinds of businesses."

It's arguable that digital technologies are helping small companies even more than big companies.

Gerald Cohen
President and CEO, Information Builders

15%

say that machine intelligence will have a significant impact on their business in the coming year

62%

of firms actively using machine intelligence say it's helping teams analyze business outcomes

54%

are using cognitive interpretation to turn images and text into data they can use

43%

predict that cognitive insights will be the most beneficial application of machine intelligence

Machine intelligence

Would you like to know when a piece of equipment is going to break down, before it actually does? Today, predictive maintenance analytical models and algorithms that are connected to equipment instrument panels can spot problem areas before the asset fails, allowing companies to intervene quickly.

This is but one example of how machine intelligence is giving companies across the spectrum greater insights into their operations and identifying ways to be more productive. Today, more and more companies are turning to tools that mimic and augment human judgment by combining software learning with machines to concurrently predict behaviors. Where foundational analytics was about helping companies sift through stores of existing data, machine intelligence is interpreting information in real time and automating the process to eliminate human limitations.

While this kind of capability was once discussed in the future tense, it's clear from our survey that machine intelligence is very much part of the here and now for mid-market and private companies. In response to a new survey question this year, 15 percent of respondents believe that machine intelligence will have a significant impact on their business in the coming year. Among firms that are actively using machine intelligence, 62 percent say it's helping their teams analyze business outcomes. Meanwhile, more than half (54 percent) are using cognitive interpretation to turn images and text into data they can use.

In addition, many of the respondents—43 percent to be exact— predict that cognitive insights will be the most beneficial application of machine intelligence. Human resources is one ripe area for such insights. For instance, companies are using machine platforms such as chatbots to guide prospective candidates through the application process. They are also taking advantage of machine learning tools that can rank the priority of vacancies across an organization. The solutions seek to interpret behavior, predict future patterns, and ultimately help workers optimize tasks.[2]
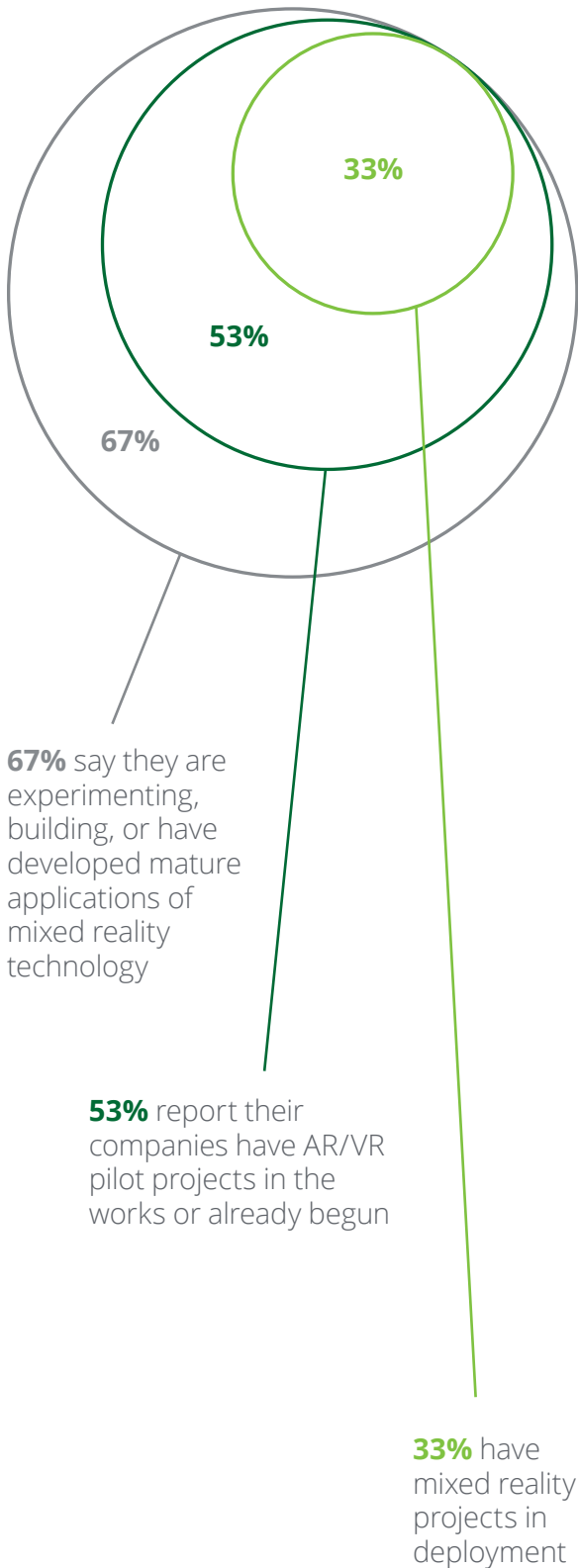
33%

53%

67%

67% say they are experimenting, building, or have developed mature applications of mixed reality technology

53% report their companies have AR/VR pilot projects in the works or already begun

33% have mixed reality projects in deployment

Mixed reality

Mixed reality, once confined to works of science fiction, is another innovation that has moved beyond the concept stage—and mid-sized and private companies have taken notice. The mixed reality world blends augmented reality (AR), virtual reality (VR), and Internet of Things (IoT) technologies to enhance engagement and add a more natural dimension to interactions with machines.

More than half of the respondents report their companies have AR/VR pilot projects in the works or already begun, while a third say they have already graduated to deployment stage. Two-thirds of respondents said their companies were experimenting, building, or had developed mature applications of mixed reality technology. Among specific sectors, energy firms are placing the most fuel behind such projects—with some finding that employees work faster when using smart glasses.[3]

Respondents say mixed-reality technologies are proving particularly useful in employee learning and operations-related tasks. Consumer products and financial services firms were most likely to use virtual and augmented reality for training programs. Technology and consumer products firms, meanwhile, were most likely to apply virtual and augmented reality to tasks involving technicians, warehouse workers, or advanced machinery.

Firms that are using these technologies say growing numbers of customers see the value in such investments. David Anderson, SVP and CIO at the global engineering firm CH2M, says clients who are developing "smart cities" recognize how machine intelligence can revolutionize traffic and transportation management. "The P3 (private, public partnership) environment understands it," Anderson says. "Economic development officials are envisioning the art of the possible during the project definition phase and understand the potential use of sensor technologies to forecast traffic patterns, gauge business activity, and plan for consumer flows. It's a matter of recognizing what technology is available today and embracing that for the future."

Companies are reimagining their role in the cloud, handing over greater control to suppliers.

Matt Law
Cloud Market Offering leader, Deloitte Consulting LLP

Cloud

Few of our daily activities are more restorative than sleep. When it gets interrupted on a regular basis, it can not only make us irritable but also put public health at risk.[4] Sleep deprivation is just one of the major societal issues that cloud computing has the potential to address. Today, cloud-based software is creating the ability for clinicians to monitor patients once they leave sleep clinics.[5] It's the digital equivalent of making sure patients take their medicine; increasing compliance with sleep therapy programs can help patients rest easier and improve their overall health.

It's no secret that private and mid-sized companies are tapping the cloud like never before. Since 2014, we have been asking the respondents to identify their business' most preferred technology model. One of the most consistent trends we have witnessed over this time is the increasing reliance on externally-hosted technology solutions. At the same time, the usage of on-premises systems, hardware, and support staff has generally been trending in the opposite direction. There's increasing evidence that private and mid-sized firms are also addressing their security fears by handing over control to third parties. Concerns over migration to the cloud and integration with external vendors are down for the third consecutive year.

"Companies are reimagining their role in the cloud, handing over greater control to suppliers," says Matt Law, Cloud Market Offering leader, Deloitte Consulting LLP. "The key is setting high expectations for business outcomes. With the right conditions in place, external partners can handle strategic functions while helping companies minimize risk."

More than any other reason, respondents in our survey say they lean on hybrid solutions because they give their businesses the ability to quickly adjust to business needs or changes. It's another indication of the accelerating nature of decision-making among private and mid-sized companies. Those findings tie into value. For the second consecutive year, respondents said the top reason they chose cloud-based solutions was to improve the speed of implementation of technology solutions. One of the biggest jumps in this year's survey versus a year ago was the percentage of companies selecting cloud-based applications as a means to enable their global expansion.

Incyte is one of those companies. Amidst its global expansion, the Wilmington, Delaware-based global biopharmaceutical company looks to introduce software applications in each new market through a software-as-a-service (SaaS) option, and increasingly employs cloud-based managed solutions that allow Incyte to maintain control of the application. When those options don't exist, Incyte relies on its own private cloud developed through co-located facilities and integrates with the big cloud providers as needed. That model has accelerated the company's global expansion efforts, says CIO Steve Lerner.

"Everybody has the same technology choices available to them, so you can make a lot happen," Lerner says. "Having the funding available and being able to bring new IT solutions in without having as much legacy infrastructure to work with certainly puts us at an advantage."

Blockchain

The shared-ledger technology known as blockchain is making business more efficient and transparent for companies of all sizes. If credit scores have long determined the terms of certain financial transactions, blockchain-based solutions will raise the stakes even more for reputation and digital identities by adding a higher level of trustworthiness to digital interactions.[6] For private and mid-sized companies, the possibilities range from the ability to verify property records for real estate deals to reducing investment transaction errors to preventing fraud in supply chain operations.
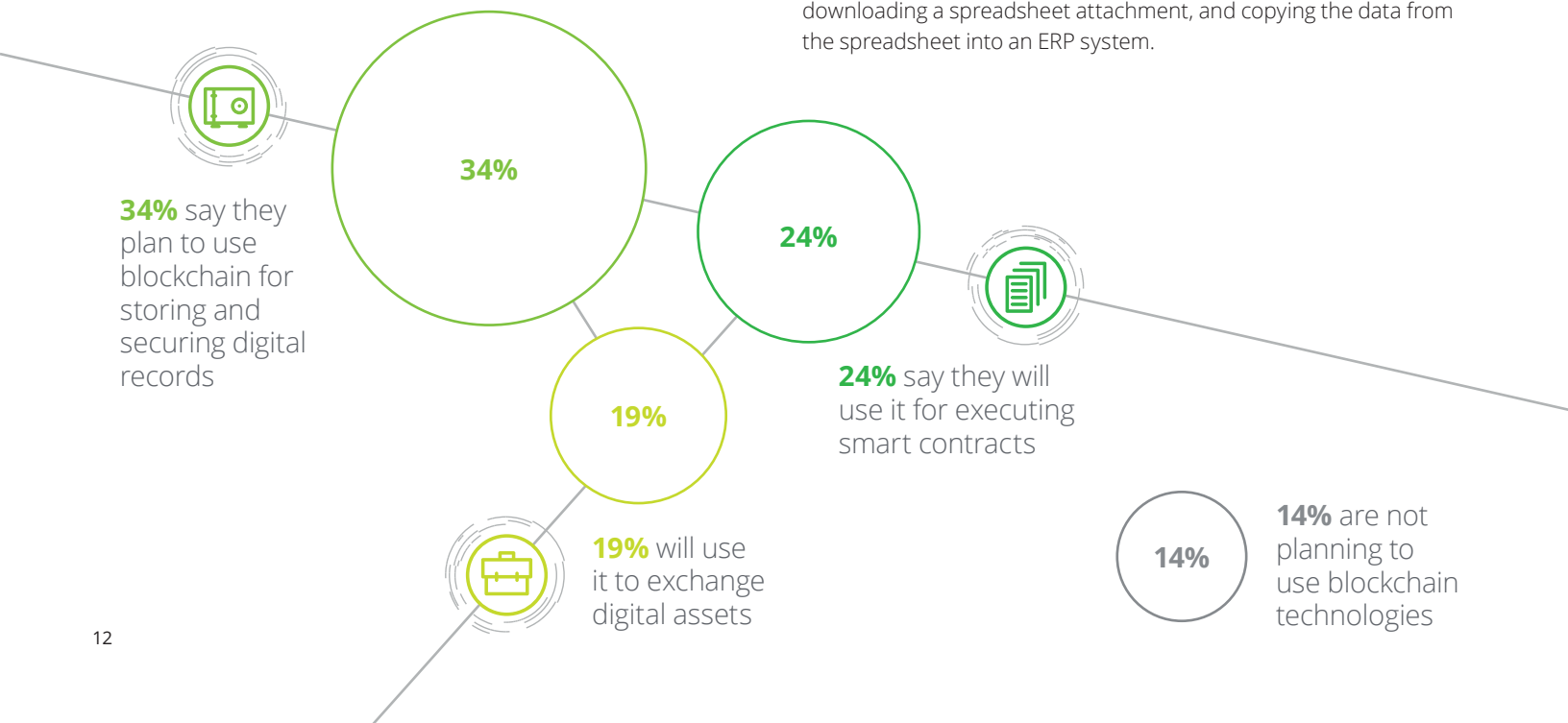
In a new question this year, we asked respondents to identify how their companies are incorporating blockchain in their plans. The executives are most bullish on storing and securing digital records as the most likely future use of blockchain technology. About a quarter of respondents anticipated taking advantage of the technology's ability to execute smart contracts. Meanwhile, one-fifth of respondents cited the importance of exchanging digital assets, allowing assets to be transferred without banks or payment processors acting as intermediaries.

"Blockchain has the potential to transform every transaction platform and fabric we use daily," says Eric Piscini, principal and Global FSI Digital Transformation and Blockchain Leader, Deloitte Consulting LLP. "While initially focused on the financial services industry, blockchain is now embraced by other industries, given its potential for disruption and the many opportunities it creates to increase trust and replace middle men with cryptography."

"With blockchain, we are talking about a technology that has huge potential in the trust space," adds Chris Jackson, chief of staff for Deloitte Growth Enterprise Services, Deloitte Consulting LLP. "It can provide a secure method to speed payments, and can help existing businesses create and identify new business models and revenue streams."

And when combined with something like Robotic Process Automation (RPA), it can change the dynamics in claims or mortgage processing and payments.

"RPA can automate repetitive, rules-driven processes to provide more efficiency and accuracy," says John Little, National Risk and Financial Advisory leader for Deloitte Growth Enterprise Services and principal, Deloitte Transactions & Business Analytics LLP. RPA uses computer software or "bots" to perform repetitive rules-based tasks to boost capabilities and save time. Examples of RPA include opening an email, downloading a spreadsheet attachment, and copying the data from the spreadsheet into an ERP system.

34%

34% say they plan to use blockchain for storing and securing digital records

24%

24% say they will use it for executing smart contracts

19%

19% will use it to exchange digital assets

14%

14% are not planning to use blockchain technologies

FilmRise helps to define the "new world" of media distribution

Ever wonder how all of that digital content makes it to streaming platforms like Amazon and Hulu? The answer is through companies like FilmRise. The New York-based distribution company licenses film and TV titles and makes them available on digital platforms. At a time when legacy media companies are struggling to manage the transition from DVDs to digital media, distributors are part of a new breed of companies that are not tethered to the past, and therefore can be a lot more nimble in taking advantage of the rapid change in consumer viewing behavior driven by technological disruption.

"We're part of a new world," says FilmRise Chief Executive Officer Danny Fisher. "We have digital distribution in our DNA. We are not burdened by any legacy structures. On the spectrum between buggy whips and cars, we're a Formula 1 car."

FilmRise serves as a full-spectrum distribution company across all distribution channels, including theatrical releases. FilmRise also licenses its titles to traditional TV networks and is working closely with traditional cable providers by supplying them with commercially viable fare. The company also successfully releases its titles on DVD and BluRay under an On-Demand model that it has worked on closely with Amazon and that is upending the traditional DVD business.

But FilmRise's core business, the one that accounts for the vast majority of its revenue, is delivering programming to digital platforms. Success in that arena depends on staying on top of the ever-changing objectives of the major digital platforms and the interplay between traditional and new-media companies, both in the domestic and international markets.

Navigating what is coming next is critically important to us. That's the issue we spend the most time talking about.

Danny Fisher
CEO, FilmRise

As the number of players entering the space is growing, each with their own identity and demands, FilmRise strives to stay on top of the competitive landscape. "Navigating what is coming next is critically important to us," Fisher says. "That's the issue we spend the most time talking about." Questions the FilmRise team systematically considers include: How is the industry evolving? What's the technology risk? How should we position ourselves? What is the latest development and how can we get ahead of it?

"There's just a tremendous amount of change going on in this industry and we are successful as a company because we have been on the right side of that transition," Fisher says. "We are giving it our all for it to stay that way."

Getting closer to the customer

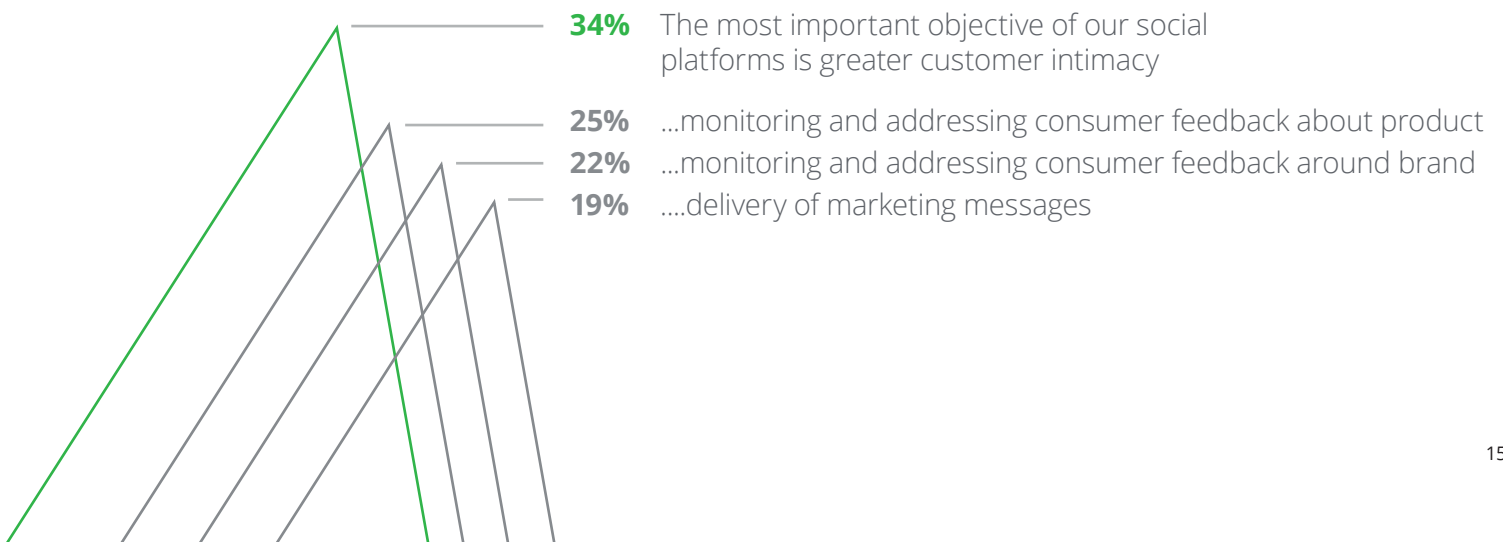**Digital disruption will alter customer interaction far more than any other dimension of business**

Technology departments aren't necessarily viewed as public-facing roles within many companies. But for the private and mid-sized firms in our survey, customers increasingly appear to be on the minds of technology leaders. Firms are making specific investments to ensure IT departments are directly involved with end users. More than half of the companies surveyed say their technology staff is focused on delivering a seamless and integrated customer experience. Nearly as many say they are actively building technology platforms to better engage with customers.
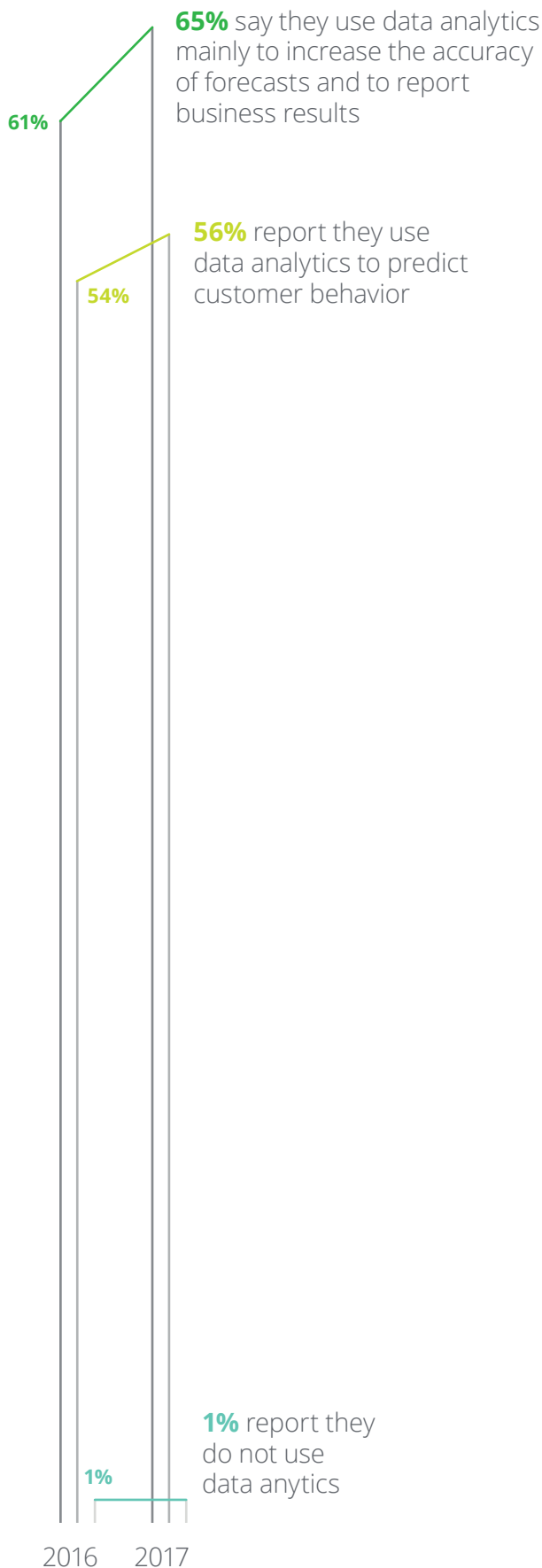
Respondents in our survey anticipate that digital disruption in the coming year will alter their interactions with customers far more than any other dimension of their business—more than streamlining of operational costs or worker productivity. Digging deeper, the respondent companies believe social business/social media and analytics will be among the digital technologies that have the most significant impact on their interactions with customers.

Social business/social media

Private and mid-market firms also want first-name-basis access to their customers; one-third of respondents said customer intimacy was the most important objective of their social platforms. The web can turn anyone into a critic with instant, global reach. Online reputation platforms give web users the ability to praise or disapprove of virtually any product or service by simply tapping their phones. What's more, a particularly unfavorable experience can quickly turn the Internet against an individual—and eventually could impact their company.

Private and mid-sized firms are responding to these new realities by becoming better listeners. Social listening is a capability many mid-market and private companies know they need to develop to help manage their reputation, and some are putting more resources behind it than their larger, public competitors. Forty-eight percent of those in our survey indicate their companies have teams that track online mentions and activity on their brands. Separately, one-third of companies use automation to monitor those messages. For comparison's sake, a University of Massachusetts-Dartmouth study found that Fortune 500 companies have consistently maintained a lesser blog presence than lower-revenue Inc. 500 firms.[7]

34% The most important objective of our social platforms is greater customer intimacy

25% ...monitoring and addressing consumer feedback about product

22% ...monitoring and addressing consumer feedback around brand

19% ....delivery of marketing messages

65% say they use data analytics mainly to increase the accuracy of forecasts and to report business results

61%

56% report they use data analytics to predict customer behavior

54%

Machine intelligence/mixed reality

Today, anyone can have a "conversation" with a smartphone or an intelligent assistant. The exchange might start off like this: What's the weather like? Make a grocery list. Check my bank balance.[8] Digital data is expanding by leaps and bounds—roughly doubling in size every 12 months—as machine intelligence answers the call for cognitive computing power. Applications can make plans and inferences, identify speech as someone would recognize our voice on the other end of a phone call, or mimic human tasks through robotic process automation.[9]

While the survey respondents continue to use data analytics mainly for increasing the accuracy of their forecasts and reporting of their business results, they also see a prominent role for the technology in predicting the behavior of their customers. That helps explain why sales and customer management, along with marketing efforts, remain the top two areas where the companies are putting analytics to use.

"Private companies are using technology to become more directly intimate with customers through machine learning and predictive analytics, and it's helping them get much better at matching products and services to their needs," says Anthony Stephan, Technology Strategy and Transformation leader, Deloitte Consulting LLP.

Companies also recognize that mixed reality technologies have the potential to fundamentally change the way consumers interact with their products. Take wearables, which are emerging as a go-to application for mixed reality technologies. Already, companies are placing video equipment on athletes' uniforms to allow virtual reality viewers watch a game from a specific vantage point, and augmenting shoppers' retail experiences by allowing them to virtually "try on" clothing and accessories.

1% report they do not use data anytics

1%

2016   2017

Information Builders:
Business intelligence for the masses

President and CEO Gerald Cohen started his business intelligence company before printers were invented. When he founded Information Builders back in 1975, the only way business clients could access data remotely was by calling into an IBM mainframe using a phone that sat in a cup and was attached to a terminal. You would type in a request using the company's proprietary computer language, and the information would show up on your screen. "There were no dashboards, no graphs," Cohen says. "You were lucky to get a report at all, right there on your screen. Printers came later."

That printers have come and largely gone in the 42 years Cohen's company has been in business is a testament to the massive technological change the world has witnessed. Today, Information Builders has 7,000 customers around the world, many of which are looking for new ways to monetize the data they're collecting from Internet-enabled devices and other equipment. One example is an automobile manufacturer that uses an Information Builders' system that compares repair costs across its network of dealers to ensure they aren't overcharging for items under warranty. "They saved $60 million the first year the system was put in—that's how much the repair costs went down," Cohen says. "Now it's up to $90 million a year."

As substantial as those cost savings are, Cohen believe smaller businesses have the most to gain from targeted business intelligence. "In some sense, the smaller companies have more to gain because they can grab more sales, reduce their costs, and be more efficient than their competitors without building in massive amounts of overhead," he says.

Go to the extreme end of the commercial spectrum. Thanks to Information Builders, a local florist can go to their credit card servicing company and see how their Mother's Day sales stacked up against competitors in their immediate area. "He sees a lot of roses were sold but he didn't sell as many," Cohen says. "He might use that information to make different inventory decisions the following year."

In some sense, the smaller companies have more to gain.

Gerald Cohen
President and CEO, Information Builders

Credit card companies are getting lots of information in real time around the clock. They purchase Information Builders' data dashboard to help build loyalty with their own customers, many of which are businesses looking to gain insights and ready to jump to the next credit card company if they're not getting them.

It's one example of how business insights are constantly trickling downstream in the global economy. Cohen says one dimension of the explosion of data is that competitors have emerged to tackle specific segments, like Twitter and other social media sites. "Today, there must be 50 companies that specialize in social media analysis," he says. "We offer that service as well but we're more interested in building custom solutions for our customers, like we've always been."

One of the company's latest innovations put the power of business insights in their customers' hands – literally. Information Builders now offers a range of business intelligence apps that empower customers to conduct "data discovery" on their own. "The business used to be, 'I know what I'm looking for and I need you tell me where to find it,'" Cohen says. "In today's world, you may not know what you're looking for, and once you find something you need help making sense of it. That's where we come in. We give them the tools to not only discover what they already have in their possession but also to commercialize it. It doesn't mean anything if you can't make money off of it."

Cybersecurity: All hands on deck

Data security is a problem that companies appear to be meeting with increasing sophistication

Our top technology investment priority for the coming year is cybersecurity and information security risk

48%

36%

35%

...business innovation

...reducing IT costs

The encryption world was shaken up recently when the man who wrote the 2003 guidelines recommending numbers and alphanumeric characters be used in all passwords expressed his regret in recognizing that the advice was too complicated for many to follow and discouraged their actual use. New guidelines released this year drop the requirement for special characters, along with the guidance to change passwords every few months.[10]

As password policies have evolved, so have many of the other cybersecurity measures mid-sized and private companies are putting into action. Though a persistent cause of distress, data security is a problem that companies appear to be meeting with increasing sophistication. In response to a new question in this year's survey, nearly half—48 percent—identified cybersecurity and information security risk as the top technology investment priority for the coming 12 months, ahead of such important objectives such as business innovation for developing new products and services.

This laser focus is creating some sense of relief. Respondents in our survey say they've made consistent progress in the integration of data security protocols with business partners and customers. Evidence of this lies in the fact that the last two years has seen a significant drop in the number of survey respondents worried about migration to the cloud, cloud integration, internal access controls, and mobility as areas of concern for data privacy and security. The only areas where the level of concern is rising among respondents are targeted attacks and employee-introduced risk compromising data or infrastructure.
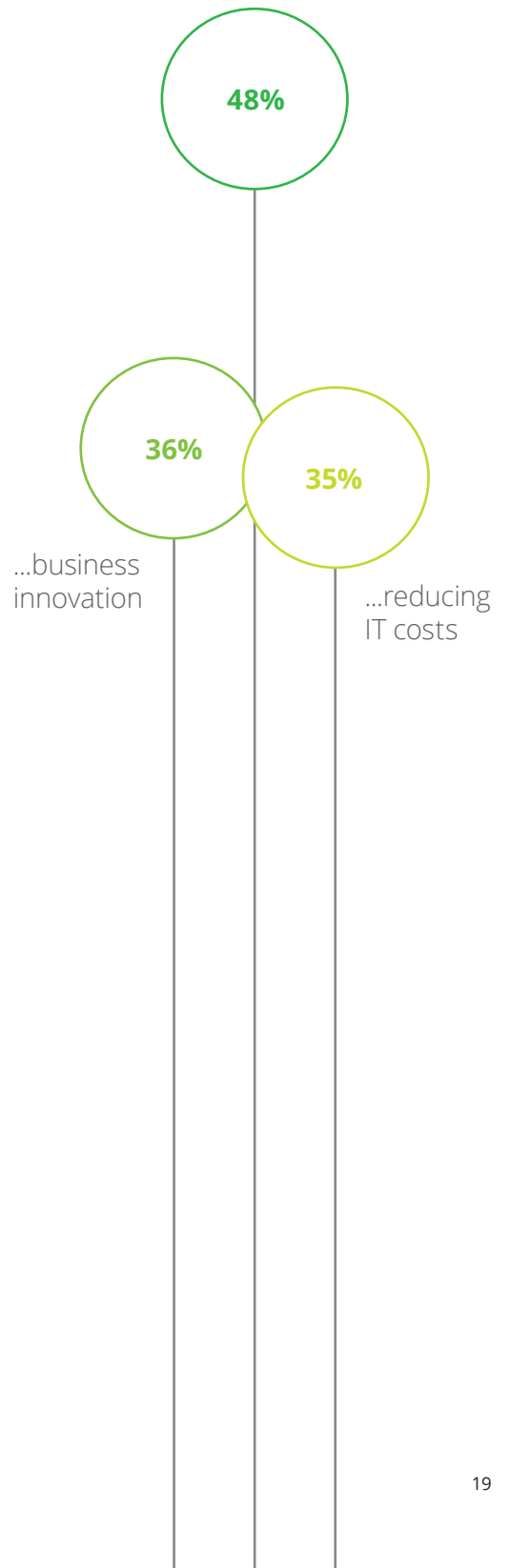
What areas were the focus of your company's information technology budget spend in the past 12 months?

60%
Implementation of new information security processes

55%
Investing in advanced hardware to mitigate security risks

54%
Threat prevention (monitoring/detection)

52%
Investing in software to mitigate security risks

51%
Educating employees about risks and security

20%
Hiring or contracting with cybersecurity specialists to address security risk

FilmRise, the film and TV distribution company profiled on page 13, operates in an industry that is increasingly in the sights of cyber thieves. However, the company faces a different kind of technological threat: websites that allow users to share copies of shows that Film Rise has paid to acquire. "We don't like it, but we're not overly concerned. Our perspective is it's really a bad user experience and viewers who use those sites ultimately get tired of it and migrate to legitimate, paid platforms," says CEO Danny Fisher.
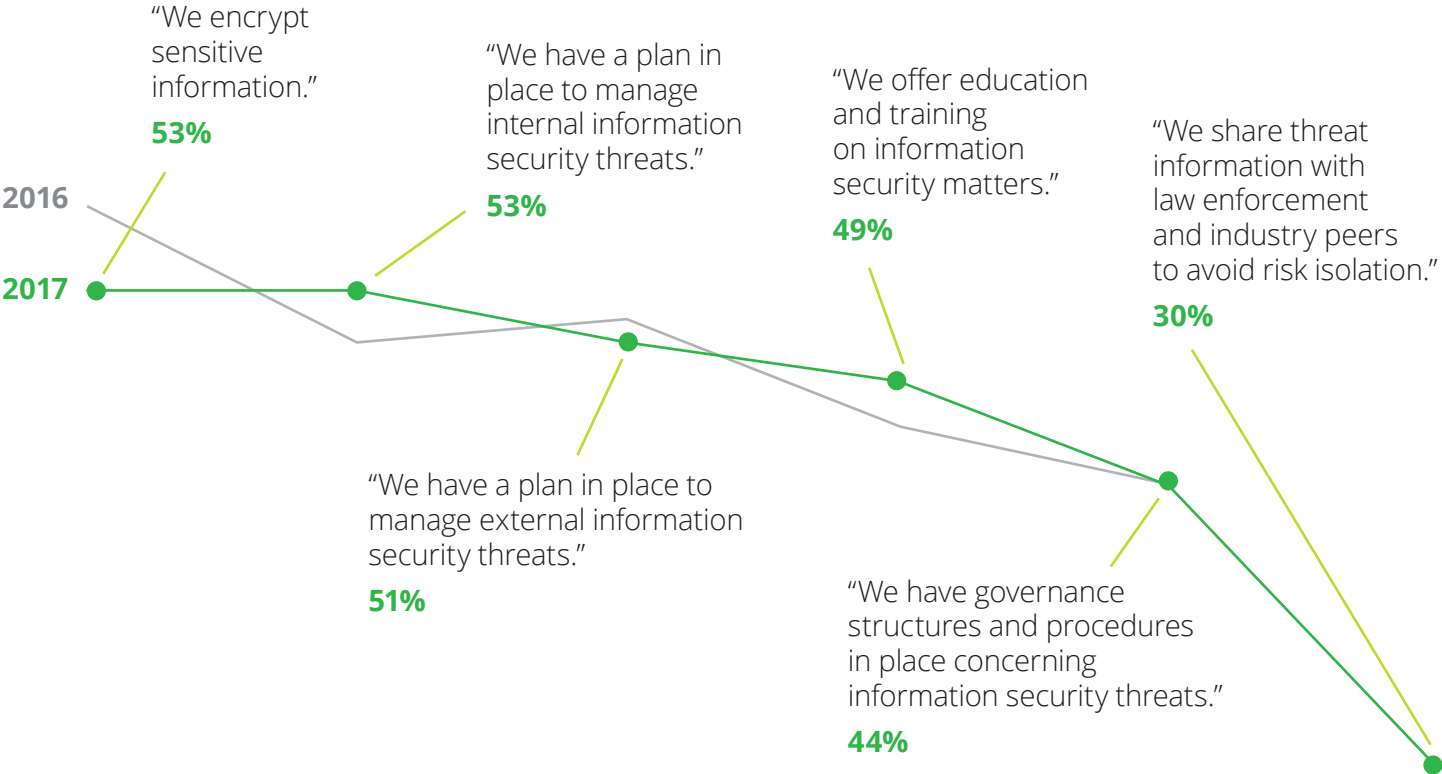
External allies
Where company leaders were once confident that their basic cyber defenses would do the job, they now understand that the task requires a comprehensive strategy that makes assets out of external providers and employees alike. While company leaders may have been reluctant to divulge details on breaches or other threats in the past, they now see information sharing as a way to better understand the security environment.

Similar to their tactics in cloud computing, respondents in our survey appear to be bolstering cyber protocols and increasingly looking outside their walls for data security guidance. More than half of company leaders report investments in advanced hardware to mitigate security risks, while 20 percent of respondents say they have hired outside specialists to work on plans of attack for data breaches. Both areas trended upward compared to 2016.
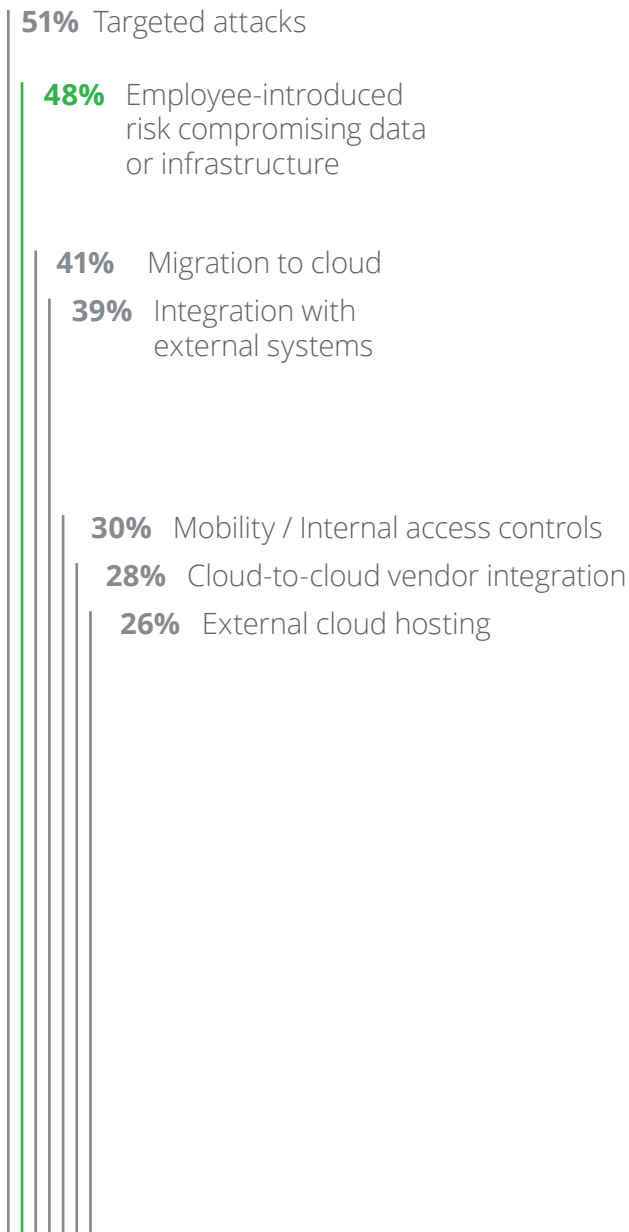
Executives now see information sharing as a way to better understand the security environment.

This year's survey explored a new dimension of data security mitigation that demonstrates how companies are getting tougher in their tactics. Thirty percent of respondents say they share information with law enforcement and industry peers in the hopes of getting ahead of threats. That information sharing is most prominent among energy firms. The results come as the US Department of Homeland Security and Federal Bureau of Investigation warn utilities and nuclear firms about hacking activities that could interrupt their networks.[11]

"We encrypt sensitive information."
53%

"We have a plan in place to manage internal information security threats."
53%

"We offer education and training on information security matters."
49%

"We share threat information with law enforcement and industry peers to avoid risk isolation."
30%

2016

2017

"We have a plan in place to manage external information security threats."
51%

"We have governance structures and procedures in place concerning information security threats."
44%

What are the data privacy
and security risk issues of
concern to your company?

51% Targeted attacks

48% Employee-introduced
risk compromising data
or infrastructure

41% Migration to cloud

39% Integration with
external systems

30% Mobility / Internal access controls

28% Cloud-to-cloud vendor integration

26% External cloud hosting

Educating employees
Meantime, companies are also continuing to confront breaches
borne out of workers' actions. Employee-introduced cyber risk
ranked almost as high as targeted attacks—such as phishing
campaigns—as respondents' top data privacy and security
risks. Almost half (49 percent) of the executives surveyed say
their company provides education and training to employees on
information security matters, up from just 30 percent two years ago.

Science reveals just how difficult it can be to change people's
behavior, however. Research shows that in addition to educating
employees on the signs of cyber threats, companies can have more
consistent success if they look at people's "behaviors, motivations,
and habits."[12]

"As we've learned from behavioral economics, humans are prone to
making mistakes, and the price of those mistakes on businesses is
rising," says Doug Beaudoin, National Consulting leader of Deloitte
Growth Enterprise Services and principal, Deloitte Consulting LLP.
"Employee-introduced risk doesn't appear in a vacuum. It's up to
leaders to get ahead of the problem by redesigning how we attract
and engage with our human resources. An organization's human
capital, data assets, and security posture all need to be managed
together."

Humans are prone to making mistakes,
and the price of those mistakes on
businesses is rising.

Doug Beaudoin
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Cybersecurity: Design a secure culture

The following is an excerpt from a Deloitte University Press article, "Exercising judgment: How behavioral economics can help midsize companies become more agile," co-authored by Robert Rosone and Tim Murphy[13]

As midsize companies are integrating more technology into their organizations, change management is likely not the only operational focus that can benefit from implementing behavioral economics strategies and tools. The No. 1 IT challenge cited by mid-market businesses is managing information security.

One might assume that better cyber threat technology holds the key to prevention, but the data suggest it really starts with the people. A recent Deloitte report, *Private company issues and opportunities: What to consider in 2017*, stresses the importance of educating employees on how to cut through everyday distractions and remain vigilant to cyber threats.[14]

But education may only be the beginning. We live in a fast-paced world, filled with distractions. Instead, behavioral science tells us that a more consistent way to protect information security is to consider people's "behaviors, motivations, and habits." By doing so, we can link employee culture to strategies and actions that can better protect company information.

Design a secure culture through choice architecture and social cues
Modifying culture in general and specifically to be more cyber-vigilant is no easy feat. As the Deloitte University Press article, *Toeing the line,* explains, in order to change culture, businesses often need to align policies, individual and group learnings, and the tools employees are expected to interact with.[15]

One might assume that better cyber threat technology holds the key to prevention, but the data suggest it really starts with the people.

Policies alone typically do not engender compliance. Like the change management case, however, peer interaction can be a powerful way to build a secure culture. Consider these tactics:

- **Leverage peer mentors.** Carefully assigned onboarding coaches can help new employees understand and embrace the values of an organization. Coaching has a long history of influencing behavior: Research has shown that strong coaching environments are tied to strong business performance and engagement.

- **Make the group image the self-image.** A West Point Army study shows the power of group belonging. From the first day of training, cadets receive the same uniforms, haircuts, and routine—all in the spirit of espousing the same values across the group. With repetition, cadets internalize these values and they become integral to their own self-image. This can be akin to corporate environments that provide new employees with laptop locks and employee badge lanyards that prominently display the company logo.

At the individual and group levels, security-minded behaviors also can be reinforced simply through example. From simple activities like locking up an unattended laptop to always wearing an employee badge in a highly visible location, how our peers behave signals how we should behave, and over time, what our peers believe can become what we believe.
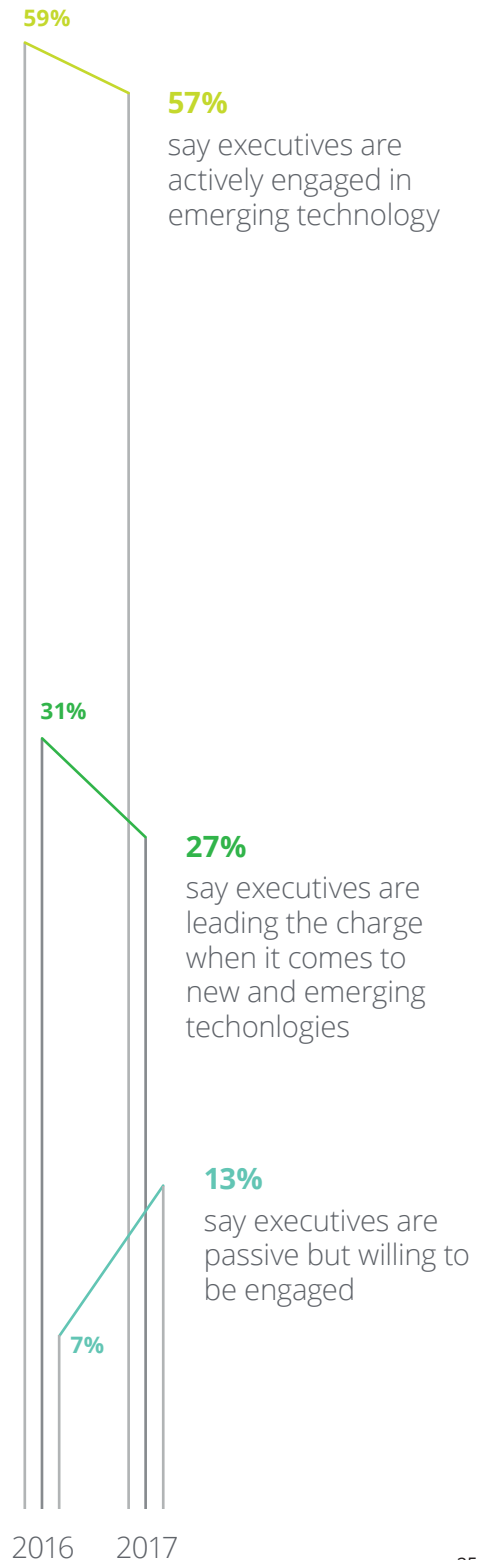
Collaborative leadership adjusts to the times

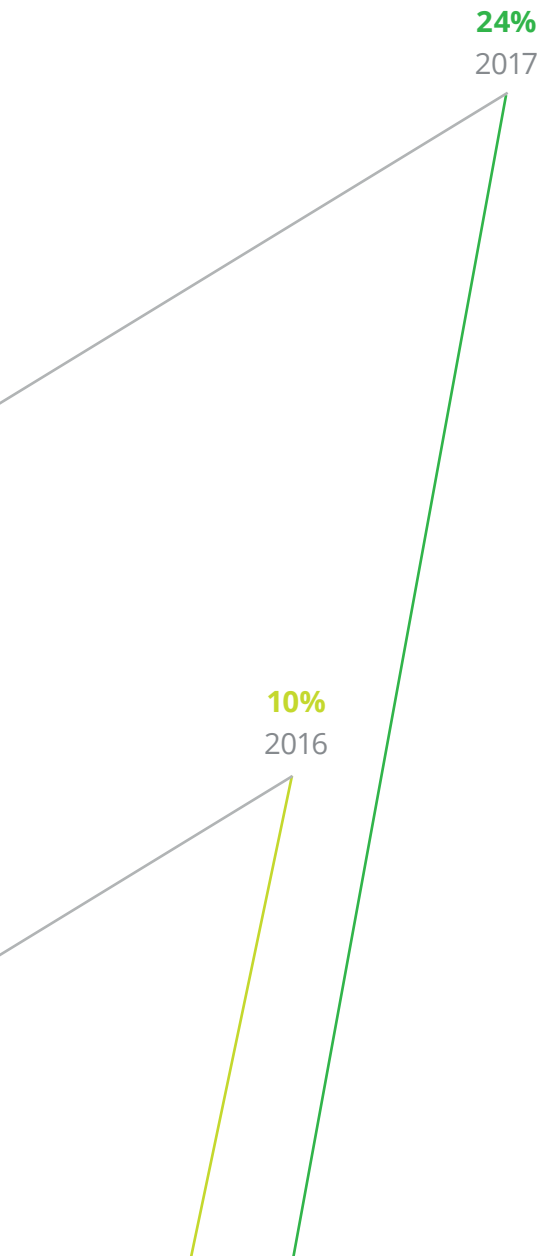**Roles are changing; companies are redrawing the organizational map**

For years, open-plan offices were all the rage. The thinking was that wide-open spaces would cook up big gains in productivity and collaboration across teams. When companies found out that wasn't necessarily true, bosses reset the floor plan.[16] Now, many employers are opting for hybrid setups that mix open space with private areas. Well-governed companies are constantly working to identify these kinds of issues before they become intractable. The stakes are much higher with technology investments, where lack of coordination can expose businesses to higher cost, lost revenue, and the wrong kinds of exposure.

Our technology surveys of private and mid-sized firms over the past five years have consistently shown that such firms are indeed adjusting to the times, and at the very top levels of corporate leadership. The results indicate that as companies have closed the knowledge gap with bigger firms and adjusted to next-generation technologies, the CEO isn't necessarily leading the charge. Roles are changing. Companies are redrawing the organizational map, with chief executives sharing responsibility with IT leaders so that technology managers can become more in tune with the business.

For a growing share of firms this year, both business leaders and IT staff have their hands on the controls when it comes to new and emerging technologies. The proportion of executive leaders who are driving adoption of emerging technology has declined steadily over the past two years, though they remain actively engaged at a majority of the respondent firms.

59%

57%
say executives are actively engaged in emerging technology

31%

27%
say executives are leading the charge when it comes to new and emerging techonlogies

13%
say executives are passive but willing to be engaged

7%

2016   2017

24% say their companies intend to investigate IT governance (up from 10% last year)

24%
2017

10%
2016

Mid-sized and private companies also appear to be making a big push into strengthening IT governance. This year's survey captures a big leap among firms—from 10 percent in 2016 to 24 percent this year—that intend to investigate governance, even if they don't currently have solid processes in place.

For fast-growing Incyte, the company's IT governance processes are evolving as quickly as the business. "The governance is being built as we grow," says CIO Steve Lerner. "It's all happening at the same time." Lerner says he and his staff catch problems mainly through the procurement process. Any new IT solution the company wants to add is run through a change advisory board and a security review. Any staffer who uses a credit card to pay for a subscription service, for example, triggers a number of questions. Off-boarding employees or external partners jumpstarts another process, with the number of checks dependent on how sensitive the data are they touched.

"The world is a lot more decentralized these days," Lerner says. "The technology enables organizations to be decentralized. If you let the business areas do what they need to get their work done, it's really about showing the value of what we bring in terms of making them safer."

The governance is being built as we grow. It's all happening at the same time.

Steve Lerner
CIO, Incyte

CH2M: Emerging technology and governance for global infrastructure

Engineers at CH2M treat the water and wastewater pipelines below us as much more than plumbing. Throughout the lifecycle of a project (design, build, operate, maintain), managing the pipeline infrastructure is crucial to local, state, and federal entities. With mobile and geospatial analytics software, workers can quickly capture and geolocate thousands of manhole covers and create visual images to facilitate enhancements, repairs, and ultimately allow utilities to make smarter decisions.

Innovation in water management is just one way CH2M is using emerging technologies to enhance work with essential infrastructure, says David Anderson, the firm's CIO since 2011. In proportion to the company's global footprint, incubating and applying next-generation technologies across a global network is no small feat. The company is engaged in 10,000+ projects a year, Anderson says, and each project creates a vast amount of data that must be stored, processed, secured, and made ready for clients to use.

"The focus is on taking command of the data which is available from multiple sources and making it available to end users in a truly meaningful, visible, and secure information portfolio," Anderson says.

The company utilizes a number of tools to fulfill those objectives. For water management projects, mobile, geospatial, and telemetry data is used to generate topographical maps more effectively than surveying the landscape by hand.

We try something, and if it works, great, and take it to the next step. If it fails fast, we get out and move onto something else.

David Anderson
CIO, CH2M

The firm's projects are underway in diverse settings. Work includes development of a natural gas field in Abu Dhabi, United Arab Emirates. There's a waterfront revitalization project along the Anacostia waterfront in Washington, DC. A smart city project in India – the biggest infrastructure investment in the country's history – is bringing a transit-oriented, walkable township in an area along the historic Silk Road.

Being involved in such an array of projects requires a well-governed IT operation with a sense of entrepreneurship, Anderson says. The company has established incubation teams operating under a "fail-fast mentality." Like technology incubators that put teams through condensed product development cycles, CH2M brings its business operations and technology teams together in these units. It's a competitive imperative in a fast-moving technology environment. "We try something, and if it works, great, and take it to the next step," Anderson says. "If it fails fast, we get out and move onto something else."

Note: Shortly after this interview was conducted, Jacobs Engineering Group announced its plans to acquire CH2M in a deal expected to close in December 2017.

Conclusion

Technology has come into its own as a shape-shifting force within US mid-sized and private companies. The digitization of commerce and everyday interactions is fundamentally changing the nature of competition. Increasingly, technology's influence isn't just leveling the playing field but tilting it, as new business models bring another dimension to existing markets in every sector of the economy.

Faced with this upheaval, mid-sized and private companies need to bring the same level of forethought and discipline to their technology decisions as they do in their corporate combinations, sales and marketing functions, talent pursuits, and capital investments. The past few decades have seen no shortage of failed technology initiatives, as well as the sunk costs and inefficiencies they leave in their wake. Today's stakes are even higher—missed opportunities to tap new digital technologies could spell the difference between meteoric growth and painful attrition.

Fortunately, the maturation of the middle market that we have tracked in annual technology surveys over the past five years points to a profitable future. Mid-sized and private company leaders are growing more sophisticated about apportioning responsibility for the IT agenda. Past impediments to investment, such as cyber threats, are becoming growth enablers with the help of outside networks. And the nimbleness that has always defined mid-sized and private organizations is emerging as a game-changing advantage for turning technology solutions into strategic success. Companies that delay action on technology can miss business opportunities and surrender their place in the digital economy.

As always, we hope you are able to use this report to identify areas of new opportunity and take action in those areas within your organizations. For all of the transformative stories captured in these pages, we know there are countless others taking shape in boardrooms, factories, supply chains, and offices across the middle market. If there's one question that defines the thinking of mid-sized and private company leaders, it's "what if?" And now, thanks to this remarkable digital evolution, we're finding out the answers.

Technology's influence isn't just leveling the playing field but tilting it, as new business models bring another dimension to existing markets in every sector of the economy.

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Perspectives

This report is just one example of Deloitte research on topics of interest to mid-market companies, including private enterprises. Presented by Deloitte Growth Enterprise Services, Perspectives is a multifaceted program that utilizes live events, signature reports, research publications, webcasts, newsletters, and other vehicles to deliver tailored and relevant insights in an integrated fashion.

Please visit our Perspectives library on the Deloitte Growth Enterprise Services website (http://www.deloitte.com/us/perspectives/dges) to view additional material on issues facing mid-market companies, including private enterprises.

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