Winning cloud strategies

How leading companies score

Executive Report

Cloud

How IBM can help

IBM Cloud enables seamless integration into public and private cloud environments. The infrastructure is secure, scalable and flexible, providing tailored enterprise solutions that have made IBM Cloud the hybrid cloud market leader. For more information, please visit **ibm.com**/cloud-computing.

Embracing a technology convergence platform

Deploying cloud technology to drive business innovation is already a mainstream tactic. To stay ahead of the competition, visionary organizations recognize that they can exploit cloud as a technology convergence platform for more advanced strategic reinvention. Cloud solutions melded with disruptive and emerging technologies – like blockchain, artificial intelligence (AI), the Internet of Things (IoT), big data and predictive analytics – can revolutionize businesses and industries. Visionary cloud leaders are already employing "cloud crucibles" to forge winning cloud strategies that create competitive advantage and boost financial success.

Clouds on the horizon

Picture this. You are the CEO of Executive Recruiting, Inc. You founded your business on the bedrock belief that one-on-one interaction is essential to determining the best candidate for a career opportunity. These days, you are feeling particularly bullish about your company's prospects. Your main competitor, Headhunter LLC, has a new CEO. But, her background isn't in recruiting – it's in technology. What were they thinking? It looks like nothing but blue skies ahead for Executive Recruiting, Inc.

Meanwhile, over at Headhunter, there is a cloud in that blue sky. The new CEO has a vision to radically transform not only her company but the entire recruiting industry. She's adding cloud-enabled cognitive employment experts to work alongside Headhunter's human recruiters. Like their living "colleagues," these artificially intelligent recruiters read introduction letters and resumes. They interview candidates "face to face," interpreting body language and inferring personality traits – often better than their biased human counterparts. In addition, they scour the internet and build a 360-degree profile of each applicant, almost in the blink of an eye.

The results? The cognitive agents identify and vet job applicants significantly faster than human recruiters. More importantly, the cognitive recruiters generate an unbiased view of which candidates are most likely to be the best fit for each job opening. Client companies working with cognitive recruiters report a higher success rate with their new hires. Not only are the cognitive agents faster and more effective, they are cheaper. This allows Headhunter to undercut the competition's fees. Finally, client companies not only benefit by acquiring employees who hit the ground running, but they retain those employees longer.

As the CEO of Executive Recruiting, Inc. – Headhunter's chief rival – your blue sky is clouding over.

65%
of surveyed cloud leaders expect
to be running IoT apps in the cloud
within the next three years

67%
of surveyed cloud visionaries
say they will invent first-of-a-kind
customer experiences with the help
of cloud

98%
of surveyed cloud outperformers
report that more than a quarter of
their customer service processes
are already in the cloud

Cloud is propelling innovation

In our last report, "Beyond agility: How cloud is driving enterprise innovation," we revealed that an unprecedented number of companies are using cloud to drive business transformation.[1] Our analysis found that more than 70 percent of companies are already leveraging cloud to generate new revenue streams by redefining customer relationships, developing cloud-enabled products and services and expanding into new industries and geographies (see Figure 1).

Today, leading companies are commanding cloud to new heights. As in our example of Headhunter LLC, leaders are employing cloud to merge new and emerging technologies into state-of-the-art offerings that transform their businesses and their industries. This paper explores how cloud leaders are deploying cloud as a technology convergence platform to create winning cloud strategies that garner competitive advantage and amplify business success.

Figure 1
Most successful cloud adoption outcomes

Expanded into new industries

| 9% | 15% | 76% |

Improved customer experience

| 7% | 19% | 74% |

Expanded product/service portfolio

| 9% | 20% | 71% |

Created new revenue streams

| 10% | 19% | 71% |

■ *Did not achieve* ■ *Moderately achieved* ■ *Significantly achieved*

Source: IBM Institute for Business Value analysis.

"One ring to rule them all"

Emerging and disruptive technologies are changing the world. Technologies like blockchain, artificial intelligence (AI), the Internet of Things (IoT), big data and predictive analytics are causing massive industry dislocation. Cloud technology offers a way to take advantage of them all.

Visionary cloud leaders understand cloud's power to reinvent business. They conceptualize cloud as a crucible – an environment where technologies can coalesce to formulate winning strategies that change everything. These cloud winners no longer regard cloud simply as a place to collect and manipulate data. They comprehend cloud as a technology convergence platform that their companies employ to fuse new technologies with strategic transformation.

Understanding "cloud as crucible" is crucial to every company's future. Soon, practically everything will connect to the cloud. By 2020, consumers will have 7 billion personal gadgets, 1.3 billion wearables and 5.7 billion additional touchpoints to the IoT.[2] By 2025, the IoT could encompass 75 billion devices.[3] In addition to networking "things," the cloud will empower AI to become embedded everywhere. Forty-six percent of high-performing organizations are already piloting, implementing and operating cognitive solutions today.[4]

The result? Cloud integrated with new and emerging technologies will rule the world. By 2020, 90 percent of business models may be driven by cloud, expanding the global cloud market to an impressive USD 250 billion.[5] To stay in the game, every organization needs to learn how to exploit cloud crucibles that deliver competitive advantage.

Leaders are using cloud as a crucible to forge business transformation[6]

AI
Big data
Predictive analytics
IoT
Blockchain
Cloud
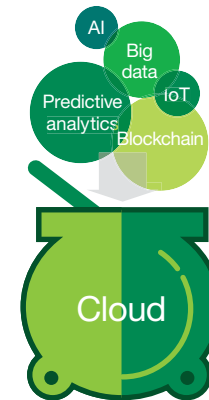
Crucible /ˈkruːsɪb(ə)l/
"a situation in which different elements interact, leading to the creation of something new"

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Defining "high-performing" cloud organizations

To analyze differences among the study's participants, we asked each respondent to self-assess based on organizational performance. A "high-performing cloud organization" is one that rates itself as a four or a five on a scale of one (low) to five (high) in both revenue/effectiveness and profit/efficiency and uses an ecosystem cloud to collaborate with business partners. Within this report, high-performing cloud organizations are also described as "cloud outperformers," "cloud leaders," "cloud visionaries" and "cloud winners." A "sidelined organization" rates itself as one, two or three on that same scale but has not adopted an ecosystem cloud or an industry-focused cloud.

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Cloud-enabled emerging technologies are instigating industry dislocation

Visionary business leaders are wielding cloud's capabilities beyond company borders. Their investments in cloud-enabled emerging and disruptive technologies are inciting industry dislocation via value chain disruption, industry convergence, new competitors and the emergence of new ecosystems.

Value chain disruption

Cloud-enabled emerging technologies are disconnecting traditional value chains with surgical precision. For example, advances in cognitive customer service agent technologies are resulting in the outsourcing of customer service functions to vendors with a command of AI. In this way, cloud-enabled technologies are exposing the transparency of value chains and are decomposing them functionally. High-performing companies are wise to this opportunity. Sixty-nine percent of outperformers are already actively encouraging new types of partnering arrangements.[7]

Industry convergence

Disruptive technologies, aided by cloud, are blurring industry lines. For example, the ubiquity of internet-connected mobile devices is dismantling the borders between the telecommunications and entertainment industries. As illustrated by the proposed merger of AT&T and Time Warner, consumer IoT-enabled viewing behaviors have driven telecom companies to scramble for content and media firms to seek wireless distribution. Boundaries are becoming hazier in other industries, as well. In fact, 51 percent of executives worldwide believe boundaries are blurring between industries.[8]

New competitors

Armed with game-changing technology, born-on-the-cloud challengers are disrupting the status quo by shifting industry economics in their favor. For example, taking advantage of consumer preferences for cloud-facilitated digital banking, branch-less financial technology (fintech) companies have already amassed at least as many customers as traditional brick-and-mortar banks in China.[9] Banking isn't the only industry undergoing a threatening economic upheaval. Globally, 55 percent of cross-industry executives say competition is coming from new and unexpected sources.[10]

The emergence of new ecosystems

Cloud-converged technologies are displacing traditional business partner relationships with new ecosystems. Take the auto industry, for example. Traditionally, the ecosystem of an auto manufacturer was focused on hardware vendors, such as parts suppliers. However, as cars connect to the internet, consumers are increasingly looking for mobility solutions instead of personal ownership of a physical asset. Consequently, new automotive ecosystems have emerged that include ride-sharing programs, autonomous driving software developers, trip-based insurance suppliers and cloud-based entertainment providers. Across all industries, 55 percent of executives feel that their traditional value chains are being replaced.[11]

"In the midst of chaos, there is also opportunity."

Sun Tzu

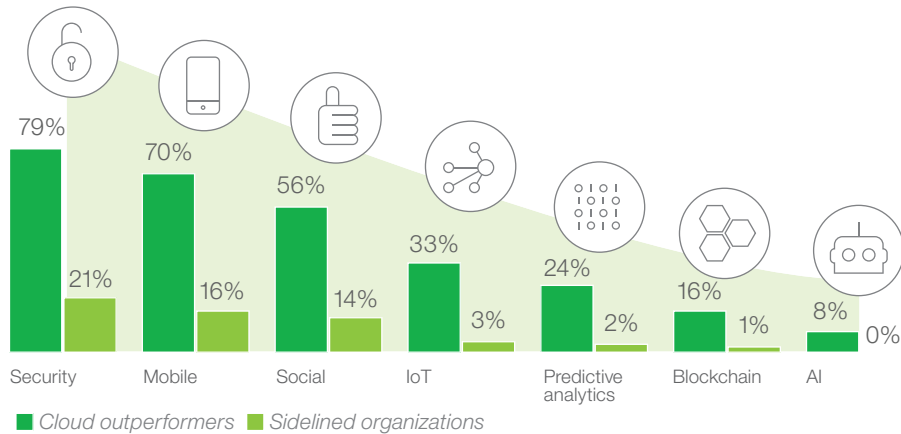## Outperformers are ahead of the game

In the midst of cloud-engineered industry dislocation, high-performing enterprises are already responding. Visionary outperformers are farther down the cloud adoption curve, exhibiting significantly more cloud utilization across all key functional areas than organizations that are stuck on the sidelines.[12] Even more tellingly, these cloud winners are a giant step ahead in the game. Stacking the deck in their competitive favor, outperforming enterprises are already exploiting cloud crucibles that fuse cloud with disruptive and emerging technologies (see Figure 2).

Why are cloud winners calling these plays? They are focused on changing the future. They do not limit themselves to merely improving the present. Whether it's developing new products and services or expanding into new geographies, outperformers have more forward-looking organizational goals.[13]

Thinking ahead, high performers realize that cloud's technology convergence power will spur innovation within their organizations and throughout their value chains. Harnessing cloud's transformative capabilities, executives in these high-performing enterprises predict that their organizations will wield cloud to invent first-of-a-kind customer experiences, attract new customers, create a new ecosystem and develop new business models within the next three years.[14]

Figure 2

Cloud outperformers are running potentially disruptive technologies more often in the cloud today

Technology	Cloud outperformers	Sidelined organizations
Security	79%	21%
Mobile	70%	16%
Social	56%	14%
IoT	33%	3%
Predictive analytics	24%	2%
Blockchain	16%	1%
AI	8%	0%

■ *Cloud outperformers* ■ *Sidelined organizations*

Source: IBM Institute for Business Value analysis.

What do winners look like?

To stay ahead of the competition, cloud leaders are already deploying cloud as a crucible for more advanced strategic transformation. Leaders understand how cloud can act as a technology convergence platform that revolutionizes their own business and industry. These winners are already melding cloud with disruptive and emerging technologies to gain competitive advantage and drive business success.

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SilverHook Powerboats creates a racing app using IoT in the cloud[15]

During a speedboat race, drivers are overwhelmed with the vast amounts of data they must assimilate in real-time to make competitive, yet safe, driving decisions. At the same time, powerboat racing fans have a hard time seeing the action happening on the open ocean, undermining their race experience. SilverHook Powerboats set out to solve both problems using cloud, predictive analytics and IoT.

To boost a speedboat driver's abilities to make strategic decisions during a race, SilverHook uploads data from a myriad of boat and GPS sensors into the cloud, where predictive analytics quickly focuses on the most important information to bring to the driver's attention. Now, a driver spends less time looking at gauges and more time safely outrunning his competitors. Intensifying fan engagement, SilverHook uses the same data to display the race in 3D, along with critical stats including boat location, speed, and leaderboards.

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Let's take a look at some of the cloud crucibles that leaders are already using to score against their competitors.

The IoT cloud crucible

Perhaps the most obvious of the cloud technology convergence platforms is the IoT cloud crucible. We live in a thoroughly connected world. Linked via cloud servers, our phones, cars, home thermostats and appliances are all humming to the tune of the internet. This connectivity benefits consumers and product and service providers alike.

IoT-connected devices are advantageous for manufacturers, who can upgrade software from afar to extend the useful life of their products while enhancing brand image and customer satisfaction. Leaders use IoT cloud crucibles to go to the next level, enhancing their physical products with valuable services. For example, some cars can already detect a destructive hailstorm on your route and advise you of an alternative course. Cloud winners don't stop with one product or service innovation. They use their IoT cloud crucibles to foster continuous innovation. These cloud winners will work with autonomous vehicle manufacturers to automatically steer around any obstacles.

Fifty-seven percent of cloud visionaries say it is important that their organizations capitalize today on the myriad devices and sensors connected to the internet.[16] Thirty-three percent of high performers are already running IoT applications in the cloud today, and this number is set to double. Almost two thirds (65 percent) of outperformers are planning to run the IoT in the cloud within the next three years. These cloud leaders are adopting IoT crucibles at eleven times the rate of cloud underperformers.[17]

The cognitive cloud crucible

With the rising flood of data flowing onto cloud platforms, organizations are struggling to grasp and assimilate valuable insights ahead of their competitors. To stay ahead of the game, cloud winners are employing cognitive solutions that turn immense amounts of data into clever insights and dexterous actions that outflank rivals.

There is no doubt that cognitive cloud convergence platforms are already transforming industries. As we've seen, cognitive cloud crucibles have the power to disrupt the recruiting industry by providing a more thorough and unbiased candidate evaluation process. In insurance, cognitive computing is already helping underwriters better assess risk, leading to more individualized insurance policies and premiums. In many industries, from retail to wealth management, cognitive cloud crucibles are already being used to enhance customer experience, facilitating entry into new markets and the generation of new revenue streams through the monetization of data.

The power of cognitive crucibles is not lost on cloud winners. Today, 25 percent of cloud leaders say their organizations need to exploit the capabilities inherent in AI, machine learning and cognitive computing.[18] Eight percent are already running AI applications in the cloud. This number is expected to quadruple, with thirty-three percent of outperformers expecting to be operating cognitive cloud crucibles within three years.[19] Now is the time to get in the game.

KIT launches a cloud-hosted cognitive computing service that optimizes course selection and career search[20]

Confronted with intensifying competition for a diminishing supply of student applicants, Kanazawa Institute of Technology (KIT), a technical university in Japan, decided to differentiate itself with superior career placement services. The service's cloud-hosted cognitive algorithms offer current students advice on the educational choices more likely to achieve their desired career outcomes. The service can also analyze a student's existing academic record to recommend career options they may have overlooked. KIT expects to enjoy a competitive advantage attracting student candidates interested in its unmatched career placement capabilities. Over time, the university's curriculum is expected to evolve to more closely align with industry needs, in turn strengthening the university's partnership with the business community.

Fresh Turf transforms logistics with blockchain on the cloud[21]

Fresh Turf set out to give online shoppers in Singapore more delivery choices by creating a solution that allows merchants, delivery companies and consumers secure access to a nationwide system of delivery lockers installed in apartment houses and residential neighborhoods. Applying blockchain technology on the cloud, Fresh Turf created a solution that provides competitor merchants and delivery companies with shared access to the lockers. Using a private and permissioned shared ledger on a single blockchain, Fresh Turf verifies identity while maintaining the privacy of transactions between specific parties. The results? Singapore residents have an additional convenient and secure delivery option for their ecommerce activities. Delivery companies conveniently place packages in lockers on their first run, cutting costs by reducing repeated delivery attempts.

The blockchain cloud crucible

Imagine that the data for a critical business process in your value chain enters a cloud. Once in the cloud, every operation on every piece of data for that business process – in other words, every single transaction – is entered into a permanent public record that all parties to that transaction can access. In this world, everyone involved in a transaction can see the transaction: when it occurred, who was party to it, and who accessed the data and when. But, no one can modify the public ledger once a data operation has occurred. As a result, the cloud tracks everything that has happened for this business process, and only a truthful account of events can prevail. Any auditor can go to the cloud to easily verify what has occurred. This is the world of the blockchain cloud crucible.

Blockchain cloud crucibles are already popping up for a variety of business and government processes, including securing the supply chain, safeguarding financial transactions, verifying digital identities, transmitting health data and digital voting. Many more blockchain cloud crucible applications are in development, including distributed blockchain cloud data storage, decentralized notary services and binding contracts that execute automatically.

Already 16 percent of outperformers are running blockchain in the cloud today – sixteen times the rate of cloud underperformers. Within the next three years, 23 percent of high-performing enterprises expect to be operating blockchain cloud crucibles.[22]

The "combo" cloud crucible

The game-changing power of cloud as crucible is magnified when it melds multiple emerging and disruptive technologies – such as IoT, mobile, cognitive and predictive analytics– simultaneously. This fusion can accelerate business and industry transformation by revolutionizing internal processes, creating new business models, innovating industry value chains or radically reshaping customer engagement.

Keeping score? A cloud crucible will turbocharge ROI

Cloud, acting as crucible, fuses disruptive and emerging technologies to transform businesses, ecosystems and industries. Visionary organizations implementing a cloud crucible can impel a virtuous cycle of competitive benefits and financial rewards.

Adopted individually, new technologies can generate impressive ROIs. But, their true potential emerges when they are fused together in the cloud. Integrating IoT, blockchain, cognitive, mobile and social technologies with cloud can spur perpetual innovation that creates and captures new markets, generates new revenue streams and turbocharges ROI. The difference in financial and competitive benefits between an enterprise that adopts cloud merely as a cost efficiency play and one that wields cloud as a crucible for massive dislocation can be tremendous. An enterprise that uses a cloud crucible to drive ongoing innovation efforts can also achieve an advantageous gain in ROI (see Figure 3).

Figure 3

Using cloud as a crucible turbocharges ROI[23]
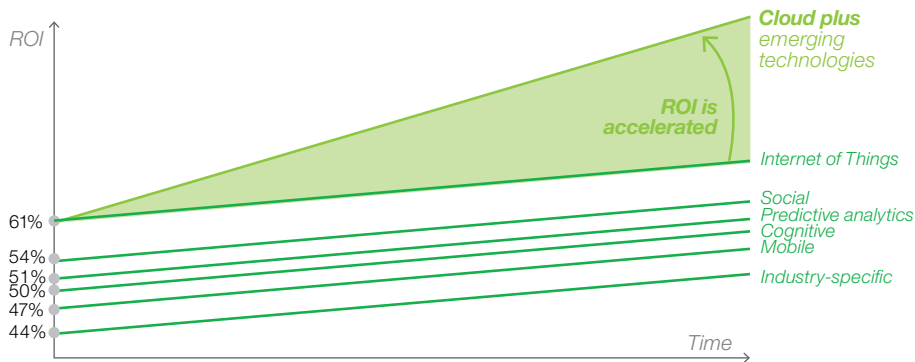
Source: IBM Institute for Business Value analysis.

Medtronic creates a cloud-based cognitive mobile app that helps manage diabetes[24]

Many diabetics struggle with the day-to-day management of their conditions, trying to avoid dangerous and expensive health complications. To help diabetics control their disease, Medtronic is developing "Sugar.IQ With Watson," a cloud-based cognitive mobile app. Using predictive analytics and cognitive computing, Sugar.IQ will correlate physiological, lifestyle, and glucose data to advise diabetics on smart lifestyle choices in real-time, such as whether a patient can have pasta for lunch or when swimming is a good idea. Currently in development, Medtronic's goal for the app is improved insulin management and glucose control through timely, healthier patient choices.

To the victor goes the spoils

Whether you are a consumer electronics company protecting a home against damage from leaking pipes, a bank authenticating a customer's identity, or a telemedicine provider, a cloud technology convergence platform confers competitive advantage. To keep score like a winner, track these cloud crucible benefits.

Financial benefits

Not only will a cloud crucible turbocharge ROI, it confers additional financial rewards. The top three financial benefits that cloud outperformers emphasize are improved ROI (59 percent), cost reduction (57 percent) and enhanced market valuation (46 percent).[25]

Product/service benefits

Cloud visionaries meld emerging and disruptive technologies in their cloud crucibles to achieve the following top three product/service benefits: improved functionality (62 percent), enhanced features (59 percent) and faster time to market (58 percent).[26]

Customer benefits

High performing companies adopt cloud technology convergence platforms to gain competitive advantage through increased customer loyalty. As a result, they expect cloud crucibles to drive customer benefits by enhancing product/service experience during use (57 percent), augmenting customer retention (46 percent), enhancing customer service capabilities (44 percent), lowering the cost of customer acquisition (44 percent) and enhancing customer interaction during the marketing/sales process (44 percent).[27]

Operational benefits

Cloud outperformers count on deriving operating advantages from their implementation of cloud crucibles. But the top three operational benefits that cloud outperformers expect may come as a surprise. Cloud winners require their crucibles to enhance technology agility (63 percent), boost employee satisfaction (57 percent) and improve business scalability (57 percent).[28]

Getting ahead of the game – the path to a winning cloud strategy

How can your organization pursue a winning cloud strategy? We recommend four steps (see Figure 4).

1. Prioritize disruptive and emerging technologies

Given your organization's competitive context and strategy, identify and develop use cases where disruptive and emerging technologies can transform your business and your industry. For each use case, define business outcomes, including customer experience consequences, as well as expected value. Given constraints such as your enterprise's risk profile and finances, prioritize and identify which use cases – and which disruptive and emerging technologies – will move forward.

2. Build your cloud crucible

Construct your cloud environment to perform as a crucible, fusing emerging and disruptive technologies that transform your organization, your ecosystem and your customer relationships. To maximize impact, make your cloud crucible available enterprise-wide and encourage co-creation efforts across disparate parts of your company and value chain.
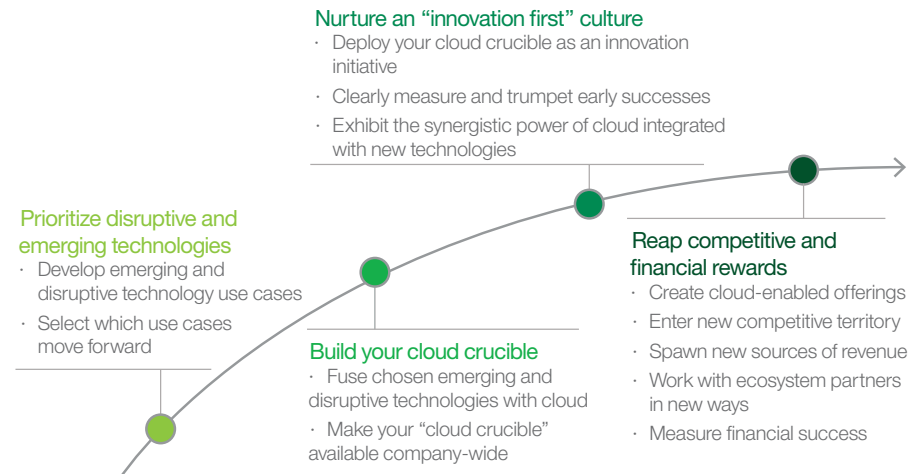
3. Nurture an "innovation first" culture

To strengthen your organization's innovation culture, reward in-house innovators by clearly trumpeting their successes. Demonstrate and exhibit how cloud integrated with new and emerging technologies creates solutions more powerful than could have been achieved otherwise. But don't stop there. Draw customers and business partners into innovating solutions that leverage your cloud crucible as well.

4. Reap competitive and financial rewards

Exploit your cloud crucible to invent first-of-a-kind cloud-enabled offerings, enter uncharted competitive territory, spawn ingenious sources of revenue and create original business models. Organize ecosystem partners in creative ways that prioritize efficiency and customer-centricity. Apply ROI to measure financial success.

Figure 4
The path to a winning cloud strategy

Nurture an "innovation first" culture
· Deploy your cloud crucible as an innovation initiative
· Clearly measure and trumpet early successes
· Exhibit the synergistic power of cloud integrated with new technologies

Prioritize disruptive and emerging technologies
· Develop emerging and disruptive technology use cases
· Select which use cases move forward

Build your cloud crucible
· Fuse chosen emerging and disruptive technologies with cloud
· Make your "cloud crucible" available company-wide

Reap competitive and financial rewards
· Create cloud-enabled offerings
· Enter new competitive territory
· Spawn new sources of revenue
· Work with ecosystem partners in new ways
· Measure financial success

Source: IBM Institute for Business Value analysis.

How will you build your winning cloud strategy?

- What benefits could your organization gain by leveraging the power of cloud with emerging and disruptive technologies?
- What is the opportunity cost to your enterprise's competitive position if you don't combine cloud with new technologies?
- What criteria are most important to prioritizing which disruptive and emerging technologies you need to place in your cloud crucible?
- What is your action plan for developing a "cloud as crucible" environment?
- What steps will your organization initiate today to accelerate fusing cloud with new technologies?

"Every silver lining has a cloud.'"

Mary Kay Ash

For more information

To learn more about this IBM Institute for Business Value study, please contact us at iibv@us.ibm.com. Follow @IBMIBV on Twitter, and for a full catalog of our research or to subscribe to our monthly newsletter, visit: **ibm.com**/iibv.

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IBM Institute for Business Value

The IBM Institute for Business Value (IBV), part of IBM Global Business Services, develops fact-based, strategic insights for senior business executives on critical public and private sector issues.

How we conducted our research

To learn how winning organizations differentiate themselves using cloud, in 2017, we surveyed 2,000 global respondents from 19 industries headquartered in 16 countries. Twenty-five percent of respondents held the title of CEO or Head of Strategy and 30 percent held the title of CIO, CTO, Head of IT or Head of Technology.

Role chart: 2,000 respondents — 30%, 25%, 15%, 15%, 15%

Role
- CIO/CTO or head of IT
- CEO or head of strategy
- CFO or head of finance
- COO or head of operations
- CMO or head of marketing

Industry chart: 19 industries — all segments 5%

Industry
- Automotive
- Banking
- Chemicals
- Consumer products
- Education
- Electronics
- Energy and Utilities
- Financial markets
- Government/Public sector
- Healthcare
- Industrial Products
- Insurance
- Life Sciences/Pharma
- Media and Entertainment
- Petroleum
- Retail
- Telecommunications
- Travel
- Transportation

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