IBM Institute for Business Value

The power of cloud

Driving business model innovation

IBM Institute for Business Value

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Although cloud is widely recognised as a technology game changer, its potential for driving business innovation remains virtually untapped. Indeed, cloud has the power to fundamentally shift competitive landscapes by providing a new platform for creating and delivering business value. To take advantage of cloud's potential to transform internal operations, customer relationships and industry value chains, organisations need to determine how best to employ cloud-enabled business models that promote sustainable competitive advantage.

Cloud has already changed both business and everyday life, from consumers who perhaps unknowingly use it to access their favourite music to companies that purposely harness its powerful resources. While much activity and buzz relating to cloud involves its technological capabilities, the benefits of cloud adoption actually extend into the business realm.

When utilised effectively, cloud capabilities offer numerous opportunities to drive business innovation. Recent technology and social connectivity trends have created a perfect storm of opportunity for companies to embrace the power of cloud to optimise, innovate and disrupt business models.

To more clearly determine how organisations use cloud today and how they plan to employ its power in the future, we surveyed, in conjunction with the Economist Intelligence Unit, 572 business and technology executives across the globe. Our research suggests that while cloud is widely recognised as an important technology, relatively few organisations today actively embrace it to drive business model innovation. However, our survey also indicates this will change dramatically in the next few years, with more and more organisations looking to cloud to drive new business and transform industries.

Through our research, we also identified some game changing business enablers powered by cloud. Organisations are exploiting these business enablers to drive innovation that extends well beyond IT and into the boardroom. Our analysis reveals that some organisations are harnessing cloud to transform both product and service development and recast customer relationships.

We observed three business archetypes, representing the extent to which organisations use cloud to impact company and industry value chains and customer value propositions:

- **Optimisers** use cloud to incrementally enhance their customer value propositions while improving their organisation's efficiency
- **Innovators** significantly improve customer value through cloud adoption, resulting in new revenue streams or even changing their role within an existing industry ecosystem
- **Disruptors** rely on cloud to create radically different value propositions, as well as generate new customer needs and segments – and even new industry value chains.

Whether companies choose to become optimisers, innovators or disruptors depends on a variety of factors, including how much risk they are willing to assume and their current competitive landscape. We suggest business leaders carefully assess their organisations to determine which archetype they most closely match – as well as which one they aspire to in the future and how they can leverage cloud to create new business models that promote long-term growth and profit.

What is cloud?

Cloud computing is a pay-per-use consumption and delivery model that enables real-time delivery of configurable computing resources (for example, networks, servers, storage, applications, services). Typically, these are highly scalable resources delivered over the Internet to multiple companies, which pay only for what they use.

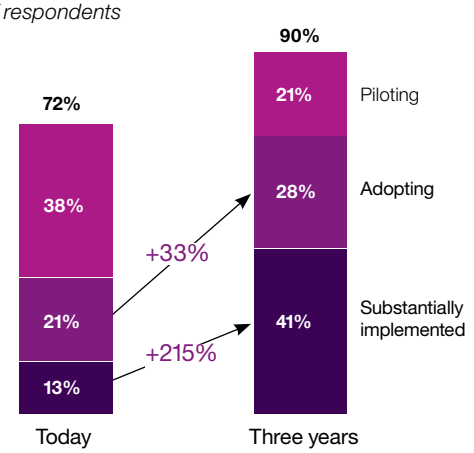
Cloud delivery models can help organisations scale their investments as they grow their business. They can also open the door to new business approaches through standardised applications, infrastructure, testing environments and business processes that help improve service delivery and efficiency.

For additional details about both business and technical aspects of cloud computing, please see ibm.com/cloud.

Cloud's bright future

Through our survey of business and technology leaders, we discovered that organisations – both big and small, across geographies and in virtually every industry are embracing cloud as a way to reduce the complexity and costs associated with traditional IT approaches. Almost three-fourths of the leaders in our survey indicated their companies had piloted, adopted or substantially implemented cloud in their organisations – and 90 percent expect to have done so in three years (see Figure 1). The number of respondents whose companies have substantially implemented cloud is expected to grow from 13 percent today to 41 percent in three years.

What is your organisation's level of cloud adoption?
Percent of respondents



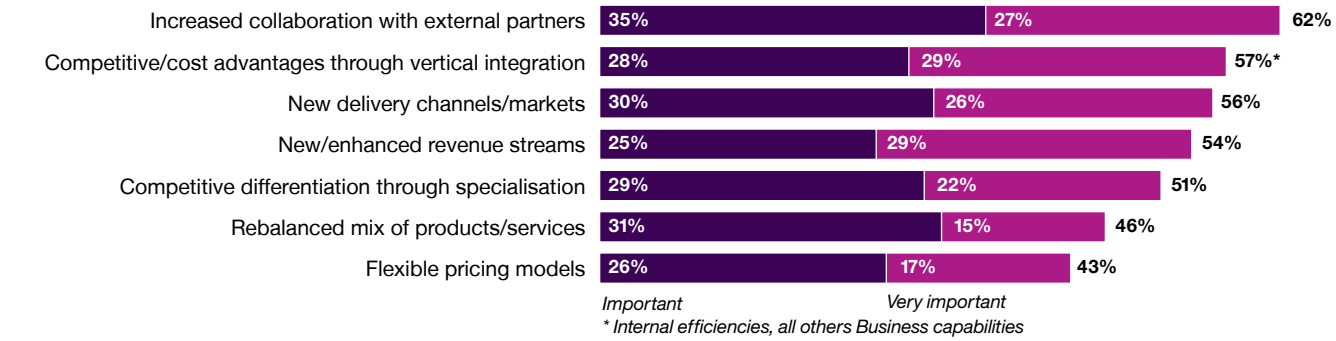
Source: 2011 IBM Institute for Business Value/Economist Intelligence Unit Cloud-Enabled Business Model Survey.

Figure 1: **A large majority of survey participants have implemented cloud at some level – and adoption is expected to accelerate in coming years.**

In IT circles, it appears cloud has almost become mainstream. Nearly half of the respondents in a recent chief information officer (CIO) Economic Impact survey indicated they evaluate cloud options first – over traditional IT approaches, before making any new IT investments.[1] This cloud adoption phenomenon is not limited to large companies. Our survey revealed that while a higher percentage of large organisations (those with revenues more than US$20 billion) are experimenting with cloud, small organisations are by no means left out of the game. In fact, 67 percent of companies with revenues less than US$1 billion and 76 percent of those with revenues between US$1 and 20 billion have adopted cloud at some level. It's not surprising then that the global cloud computing market is forecast to grow 22 percent annually to US$241 billion by 2020.[2]

Organisations are not only relying on cloud to enhance internal efficiencies, but also to target more strategic business capabilities. In fact, our respondents' number one objective for adopting cloud is an external capability that of increased collaboration with external partners (see Figure 2). Only one of the top seven objectives cited focused on internal efficiencies, with 57 percent looking to cloud to drive competitive and cost advantages through vertical integration. The rest, such as new channels, delivery markets and revenue streams, all relate to improved business capabilities.

How important are the following objectives for adopting cloud?
Percent of respondents



Source: 2011 IBM Institute for Business Value/Economist Intelligence Unit Cloud-Enabled Business Model Survey.

Figure 2: **Organisations clearly intend for cloud to improve their business capabilities, in addition to enhancing internal efficiencies.**

Interestingly, while our research clearly reveals organisations intend to rely on cloud to enhance their business capabilities, only 38 percent cite cloud as a leading priority for the entire company. Rather, cloud is still viewed by many as an IT solution, with 62 percent citing cloud as a leading priority for their IT organisations.

Our survey results suggest that organisations are just beginning to understand the power of cloud to help drive business innovation. Only 16 percent of survey respondents currently utilise cloud for sweeping innovation, such as entering new lines of business (LoB) or industries, reshaping an existing industry or transitioning into a new role in their industry value chain. However, 35 percent plan to rely on cloud for business model innovation within the next three years.

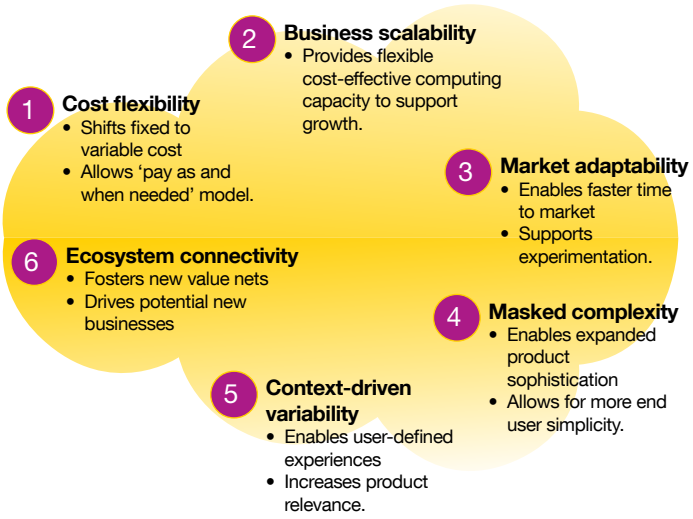
Clearly, cloud is widely recognised as an important technology, offering capabilities that positively affect IT. However, its full business potential has yet to be realised or even understood by most organisations.

Tapping the power of cloud

The world is experiencing a digital and mobile transformation, with more information available more quickly in more mediums than ever before. As part of this, consumers have jumped on the social media bandwagon, with many relying on it as their primary collaboration format. Add to this the advent of new analytics capabilities and the results are sweeping changes in almost every aspect of daily business and consumer life.

But how does cloud play into all of this? Cloud provides a way for businesses to exploit the capabilities borne of these digital trends to better meet customers' needs and drive future growth. In fact, our research illuminates six key cloud attributes being used to power business model innovation, which we've dubbed business enablers: Cost flexibility, business scalability, market adaptability, masked complexity, context-driven variability and ecosystem connectivity (see Figure 3).

Cloud's business enablers



Source: IBM Institute for Business Value analysis, 2012.

Figure 3: **Cloud empowers six potentially 'game-changing' business enablers.**

1. Cost flexibility

Cost flexibility is a key reason many companies consider cloud adoption in the first place. More than 31 percent of executives surveyed cited cloud's ability to reduce fixed IT costs and shift to a more variable 'pay as you go' cost structure as a top benefit.

Cloud can help an organisation reduce fixed IT costs by enabling a shift from capital expenses to operational expenses. IT capital expenses – which typically include enterprise software licences, servers and networking equipment – tend to be less fluid, more expensive and harder to forecast than routine IT operating expenses. With cloud applications, there is no longer a need to build hardware, install software or pay dedicated software licence fees. By adopting cloud services, an organisation can shift costs from capital to operational – or from fixed to variable. The organisation pays for what it needs when it needs it. This pay-per-use model provides greater flexibility and eliminates the need for significant capital expenditures.

Cost flexibility is certainly an appealing cloud attribute for Etsy, an online marketplace for handmade goods. In addition to bringing buyers and sellers together, Etsy also provides recommendations for buyers. Using cloud-based capabilities, the company is able to cost-effectively analyse data from the approximately one billion monthly views of its website and use the information to create product recommendations. The cost flexibility afforded through cloud provides Etsy access to tools and computing power that might typically only be affordable for larger retailers.[3]

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2. Business scalability

IT scalability is recognised by many as a major benefit of cloud adoption. However, cloud offers more than just IT scalability – it allows an organisation to easily scale its business operations as well.

By allowing for rapid provisioning of resources without scale limitations, cloud enables a company to benefit from economies of scale without achieving large volumes on its own. Recognising cloud's ability to facilitate efficient growth and expanded options, approximately a third in our survey view business scalability as a top cloud benefit.

For this concept in action, consider Netflix, an Internet subscription service for movies and TV shows. Because it streams many movies and shows on demand, the company faces large surges of capacity at peak times. As Netflix began to outgrow its data centre capabilities, the company made a decision to migrate its website and streaming service from a traditional data centre implementation to a cloud environment. This move allowed the company to grow and expand its customer base without having to build and support a data centre footprint to meet its growth requirements.[4]

3. Market adaptability

In today's economic environment, the ability to respond to rapidly changing customer needs is a key competitive differentiator. As such, companies continuously seek ways to improve their agility to adjust to market demands. A third of the executives we surveyed believe cloud can assist in this respect, citing market adaptability among cloud's top benefits. By enabling businesses to rapidly adjust processes, products and services to meet the changing needs of the market, cloud in turn facilitates rapid prototyping and innovation and helps speed time to market.

ActiveVideo certainly recognised cloud's power to enhance market adaptability when it created CloudTV, a cloud-based platform that unifies all forms of content – web, television, mobile, social, video-on-demand, etc. – onto any video screen. Content and applications from web content creators, television networks, advertisers and other media entities can be developed quickly for CloudTV using standard web tools. CloudTV leverages content stored and processed in the network cloud to significantly expand the reach and availability of web-based user experiences, as well as to allow operators to quickly deploy a consistent user interface across diverse set top boxes and connected devices. The CloudTV approach of placing the intelligence in the network, rather than the device, enables content creators, service providers and consumer electronics manufacturers to create new television experiences for their viewers.[5]

4. Masked complexity

In addition to business scalability and market adaptability, cloud also offers the advantage of masking complexity. Cloud provides a way for organisations to 'hide' some of the intricacies of their operations from end users, which can help attract a broader range of consumers. Because complexity is veiled from the end user, a company can expand its product and service sophistication without also increasing the level of user knowledge necessary to utilise or maintain the product or service. For example, upgrades and maintenance can be done in the 'background' without the end user having to participate.

20 percent of the business leaders in our survey cited 'masked complexity' as a top benefit of cloud.

Masked complexity is perhaps less recognised than some of the other enablers, as 20 percent of the business leaders in our survey cited it as a top benefit. Xerox definitely recognises this cloud attribute, however, as evidenced by its Xerox Cloud Print solution. With Xerox Cloud Print, workers can get their desired content in printed form wherever they might be by using Xerox's cloud to access printers outside their own organisation.[6] While printing from the cloud requires quite a bit of data management – with numerous files to be stored, converted to print-ready format and distributed to printers, the complexity is hidden from users.

5. Context-driven variability

Because of its expanded computing power and capacity, cloud can store information about user preferences, which can enable product or service customisation. The context-driven variability provided via cloud allows businesses to offer users personal experiences that adapt to subtle changes in user-defined context, allowing for a more user-centric experience. This is a significant cloud attribute, as evidenced by the more than 50 percent of respondents who cited 'addressing fragmented user preferences' as important for their organisations.

Siri, the Apple iPhone 4S cloud-based natural language 'intelligent assistant,' is all about context-driven variability. It allows users to send messages, schedule meetings, place phone calls, find restaurants and more.[7] While other phones have some voice recognition features, Siri 'learns your voice' as Wall Street Journal columnist Walt Mossberg put it.[8] Siri uses artificial intelligence and a growing base of knowledge about the user, including his or her location and frequent contacts, to understand not only what is said but what is meant. In a nutshell, it leverages the computing capabilities and capacity of cloud to enable individualised, context-relevant customer experiences.[9]

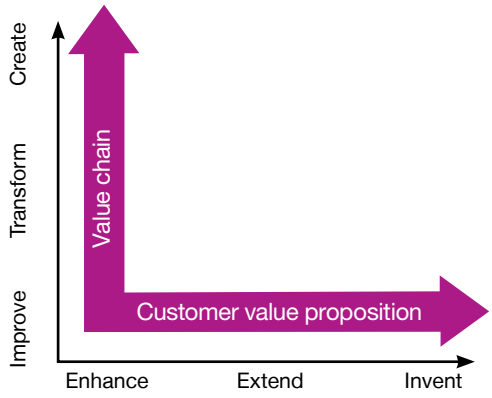
6. Ecosystem connectivity

Another business enabler powered by cloud is ecosystem connectivity, which is recognised by a third of our respondents as a major benefit. Cloud facilitates external collaboration with partners and customers, which can lead to improvements in productivity and increased innovation. Cloud-based platforms can bring together disparate groups of people who can collaborate and share resources, information and processes.

HealthHiway is a great example of how cloud can enable ecosystem connectivity. A cloud-based health information network, HealthHiway enables the exchange of information and transactions among healthcare providers, employers, payers, practitioners, third-party administrators and patients in India. By connecting more than 1,100 hospitals and 10,000 doctors, the company's software-as-a-service (SaaS) solution facilitates better collaboration and information sharing, helping deliver improved care at a low cost, particularly important in growing markets, such as India.[10]

Cloud-enabled business innovation

Cloud business enablers are already driving innovation across customer value propositions and company and industry value chains. Enterprises are applying cloud to generate additional revenue streams by enhancing, extending and inventing new customer value propositions. Cloud is being used to improve, transform and create new organisation and industry value chains (see Figure 4). This has resulted in shifts in who creates value, as well as how it is created, delivered and captured.



Source: IBM Institute for Business Value analysis. 2012.

Figure 4: **Cloud business enablers help spur innovation across customer value propositions and across company and industry value chains.**

Customer value propositions

- **Enhance:** Organisations can use cloud to improve current products and services and enhance customers' experiences to retain current and attract new customers, garnering incremental revenue
- **Extend:** Cloud can help a company create new products and services or utilise new channels or payment methods to attract existing or adjacent customer segments in an attempt to generate significant new revenues
- **Invent:** Companies can use cloud to create a new 'need' and own a new market, attracting new customer segments and generating entirely new revenue streams.

Value chains

- ***Improve:*** Cloud adoption can help an organisation maintain its place in an existing value chain through increased efficiency and an improved ability to partner, source and collaborate
- ***Transform:*** By assisting in developing new operating capabilities, cloud can help a company change its role within its industry or enter a different industry
- ***Create:*** Organisations can use cloud to build a new industry value chain or disintermediate an existing one, radically changing industry economics.

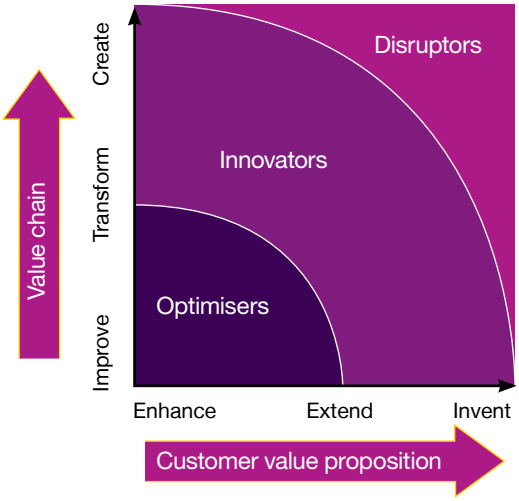
Cloud Enablement Framework

Using the extent to which an organisation's use of cloud can affect value propositions and value chains as dimensions, we created a 'Cloud Enablement Framework,' which identifies three organisational archetypes: Optimisers, innovators and disruptors (see Figure 5). These archetypes characterise the impact of an organisation's cloud-enabled business strategy. They are based on the extent to which an organisation enhances, extends or invents customer value propositions and improves, transforms or creates new value chains.

The framework is not a maturity model. We don't expect or recommend that organisations first start as optimisers and then become innovators and disruptors. Instead, an organisation should determine its place in the Cloud Enablement Framework based on the company's strategy, risk profile, competitive landscape, etc.

The 'Cloud Enablement Framework' identifies three organisational archetypes – otimisers, innovators and disruptors that characterise the impact of an organisation's cloud-enabled business strategy.

Cloud Enablement Framework



Source: IBM Institute for Business Value analysis, 2012.

Figure 5: **The Cloud Enablement Framework helps organisations classify the extent to which their use of cloud impacts value propositions and value chains.**

Optimisers

Optimisers use cloud to incrementally enhance their customer value propositions while improving organisational efficiency (see sidebar, Optimiser case study: North Carolina State University). Optimisers stand to deepen their customer relationships without risking the potential failure inherent in radical new business models. While optimisers can expand the value they offer through improved products and services, enhanced customer experiences and broader channel delivery options, they tend to realise lower revenue and market share gains than innovators and disruptors.

Optimiser case study: North Carolina State University[11]

Based in Raleigh, North Carolina State University is a comprehensive university known for its leadership in education and research and globally recognised for its science, technology, engineering and mathematics leadership.

Challenge

With more than 31,000 students and nearly 8,000 faculty and staff, North Carolina State University faced growing demand for academic computing resources, making it challenging to deliver the service level that its key user populations – students, instructors, researchers and administrators – require. The university not only wanted to fundamentally change the way it managed computing resources, it also wanted to enhance the user experience, position itself for continued growth and effectively control costs.

Cloud-enabled business model

In collaboration with IBM, North Carolina State University created its Virtual Computing Lab (VCL), a cloud-based technology that provides students, faculty and researchers access to the most advanced educational materials, select software applications and computing and storage resources. The VCL solution allows users to remotely access a desired set of applications and environments over the Internet – using a personal computer, laptop or mobile device – from anywhere at any time. The solution's flexible and intelligent resource provisioning offers significant improvements in access, efficiency and convenience over the previous approach, allowing North Carolina State University to optimise operational efficiencies and enhance the user experience. In fact, the university has now provided access to the VCL to students throughout North Carolina, including those in elementary, high school and other colleges and universities.

Business results

Moving to a cloud-based infrastructure provided North Carolina State University with:

- Increased flexibility to shift computing capacity between instructional, research and administrative needs
- The ability to scale up to match significant growth in university enrollment
- A chance to share its resources with students throughout the state, improving the education opportunities and lives of many.

Innovators

Innovators utilise cloud to significantly extend customer value propositions, resulting in new revenue streams. In doing so, they transform their role within their industry or enter an adjacent market or industry space (see sidebar, Innovator case study: 3M Visual Attention Service (VAS)).

By extending and transforming, innovators have the opportunity to combine previously unrelated elements of the value chain and value proposition to gain competitive advantage.

Innovator case study: 3M VAS[12]

The 3M VAS is an online scanning tool that scientifically analyses design effectiveness based on how the average human eye responds. VAS marries vision science with technology to help designers, marketers and other communicators test the visual impact of their content and increase the probability that viewers will notice the most important elements of a design.

Challenge

Since the global design community is made up of copious small design organisations, 3M needed to make the new capability accessible from anywhere, affordable to many and available as needed during a design project. By delivering VAS using cloud technology, 3M is able to offer the service on a continuous basis without requiring customers to install special software to use it. Hosting the solution via cloud also helps the company ensure the latest version is always available for customers.

Cloud-enabled business model

3M's cloud-enabled business model allows it to offer a new solution, known as VAS, to a new audience – the creative design community. The cloud-based offering allows 3M to transform its role in the product development value chain by closely integrating with a global network of designers. The affordable, flexible, cloud-based, pay-as-you-go model allows the company to deliver VAS in a fast, user-friendly manner that fits into a designer's existing design process.

Business results

By hosting VAS via cloud, 3M achieved:

- **A highly scalable environment – important during peak design times**
- **A low up-front investment and a flexible pay-as-you-go pricing model to help significantly reduce hosting costs and optimise profits**
- **The ability to attract new customers with an innovative solution while facilitating tighter integration within the product design ecosystem.**

Disruptors

Disruptors invent radically different value propositions, generating new customer needs. They capture unique competitive advantage by creating a new or disrupting an existing industry or market (see sidebar, Disruptor case study: Comcast Xcalibur). Disruptors often provide customers what they weren't even aware they wanted or needed! By taking a risk, disruptors can gain 'first-mover' advantage. Our survey indicates a larger percentage of disruptors expect to outperform their peers in the next three years than do innovators or optimisers. While they face greater risks, disruptors tend to anticipate higher rewards.

Disruptor case study: Comcast Xcalibur[13]

Comcast Corporation is a leading media, entertainment and communications company. It operates cable systems and develops, produces and distributes entertainment, news, sports and other content for global audiences. It is also one of the nation's largest video, high-speed Internet and phone providers to residential and business customers.

Challenge

In 2011, Comcast piloted Xcalibur, its next generation cloud-based TV platform that aims to revolutionise the way people watch TV. Xcalibur moves the company beyond the delivery of channels and video via set top boxes that use digital television technology to leveraging cloud architecture that delivers live TV service to any Internet-connected device. Leveraging Internet Protocol (IP) technology, the company can update its guide and add features more easily and cheaply. It also helps Comcast meet the demands of 'connected customers' to watch TV wherever they want and access content sources more seamlessly.

Cloud-enabled business model

The cloud-based platform shifts the ability to control content into the cloud. It enables live video feeds that serve the ever growing numbers and types of mobile and connected devices. Customers can find content tailored to their needs in new ways, for example, by using an iPad app to choose channels, on demand videos and Xfinity online streaming videos. They can then watch their selected content when and where they want, whether on TV, tablet or other device. This personalised TV experience, combined with a powerful search engine and Internet apps to access non-TV content, as well as the ability to share via social media channels, allows Xcalibur to create a radically different customer value proposition, with the potential of attracting entirely new customer segments in the future.

Business results

The *Wall Street Journal* cited this move to the cloud as evidence of 'a new phase in how Internet technologies are transforming television.' Benefits thus far to Comcast include:

- Meeting customer demands for easier access to TV and other Internet-enabled content
- Delivering content to more devices than before
- Creating new apps faster and more cheaply
- Making UI changes more quickly and easily.

To optimise, innovate or disrupt?

We recommend organisations carefully evaluate the various opportunities available to harness the power of cloud as an optimiser, innovator or disruptor and find the right opportunity for their particular circumstances or product/service line. To assist them in this regard, we recommend three key actions to help reap the potential rewards associated with cloud-enabled business models:

1. Establish shared responsibility for cloud strategy and governance across the business and IT to help ensure cloud remains a top business priority.
   - Place a senior executive business leader, in partnership with the CIO, in charge of your firm's cloud business strategy development. This collaboration should help clearly formulate an optimal cloud strategy and link it with your business and marketing strategies. In the adoption phase, these leaders will communicate and drive cloud as a top business priority, as well as ensure that infrastructure and operational efficiencies are optimised and business objectives are met
   - Establish a governing committee of business and IT leaders to oversee cloud adoption and implementation. Determine which cloud business enablers should be leveraged and how they will be used. Develop and oversee the implementation of business changes (e.g., processes, outcomes) that cloud will enable within your organisation and throughout your industry ecosystem.

Organisations can pursue the business benefits of cloud by: establishing shared responsibility for cloud strategy and governance; looking internally and externally for ways to maximise the value of cloud adoption; and determining whether to be an optimiser, innovator or disruptor.

2. Look within and beyond your organisation's borders to maximise the value derived from cloud adoption.
   - Determine how your cloud strategy can impact your industry ecosystem and identify new partners that cloud can help draw into your ecosystem. In addition, evaluate whether cloud can or should change your role in the ecosystem
   - Use cloud to respond to your industry's end customers more effectively. Explore whether cloud can help enhance your value proposition with your current customers and examine whether you can reach other customer segments by leveraging cloud.

3. Identify whether your organisation seeks to be an optimiser, innovator or disruptor and use cloud to innovate your business model to realise that potential.
   - Consider organisational and market factors – corporate strategy, competitive dynamics, customer strategy, your firm's risk profile, how empowered your customers are, etc. – that impact your cloud strategy
   - Determine where, if at all, your organisation is positioned in the Cloud Enablement Framework today
   - Determine where your organisation should be in the next three to five years – should it be an optimiser, innovator or disruptor? In considering this, remember that the framework is not a maturity model – a company does not have to first become an optimiser before becoming an innovator or disruptor. Rather, each company has to evaluate the opportunities and risks inherent within each archetype and determine 'who' they want to be and what works best for the company, industry and customer set
   - Build business and technology skills and capabilities to close the gap between your current and future cloud position or to maintain your current position if that is the goal

- Determine whether your cloud strategy should involve becoming a cloud service consumer or a provider of cloud-based offerings – or include elements of both. Typically, cloud service consumers use cloud to enhance their business models and drive increased value for their customers or business. Cloud service providers, on the other hand, offer services via the cloud to enhance the business model of other organisations or their own. Cloud service providers might use cloud to engage in innovation within their own value chain or facilitate innovation within other value chains.

Navigating your course in the cloud

As business leaders reflect on how their organisations can best realise the full potential of cloud to optimise, innovate or disrupt business models, they need to challenge existing approaches and realities. We suggest they imagine the possibilities associated with cloud-enabled business models by considering some questions:

- What if your organisation had access to unlimited computing resources to scale your business?
- What if you had access to previously unaddressed customers or markets and could target them based on their individualised preferences through analytical insights?
- What if you could give customers access to your products and services anytime, anywhere and on any device?
- What if you could inexpensively and rapidly develop and launch new product and service offerings?
- What if you could easily and seamlessly connect and collaborate with business partners and customers?
- What if you could redefine your role in your industry and change your competitive positioning?

Conclusion

Although cloud has practically become mainstream in the IT world, its promise extends well beyond technological innovation. In fact, cloud has the power to open doors to more efficient, responsive and innovative ways of doing business.

Companies worldwide are beginning to recognise cloud's capabilities to generate new business models and promote sustainable competitive advantage. As more and more companies join the bandwagon, we believe those that come out on top will be the same ones that carefully harness the power of cloud for their organisation. Whether they choose to become optimisers, innovators or disruptors, successful organisations will leverage cloud as a key point of differentiation in driving business value and success.

To learn more about this IBM Institute for Business Value study, please contact us at iibv@us.ibm.com. For a full catalogue of our research, visit:

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