WINNING IN A BUSINESS 4.0 WORLD

A TCS STUDY TRACKS BUSINESS 4.0™ ADOPTION AND IMPACT
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Leaders in the digital era have taken the basic tenets of business and reimagined how they operate. Traditional customer segmentation has given way to personalization at scale, expanding addressable markets and unlocking exponential value. The power of the enterprise has been magnified to the power of the ecosystem. And the ability to rehearse the future, thanks to Agile, cloud and other technology pillars, has given organizations the leeway to embrace risk and explore new avenues for growth.

In 2017, TCS developed a thought leadership framework called Business 4.0™ to help companies harness the power of digital technologies to drive their growth and transformation agenda. Late last year, we commissioned Longitude, a thought leadership firm that is part of the Financial Times group, to survey 1,231 senior executives around the globe to understand the extent to which firms across industries and regions have adopted the behaviors of Business 4.0, the benefits they have seen so far and the challenges they are facing in their transformation journey. The results of this inquiry are encapsulated in this study.

We found several useful insights which I believe would be valuable for you. I hope some of the findings will resonate with what you are going through and others would inspire you to reimagine.

Happy reading and reimagining!

Rajesh Gopinathan
CEO and MD
Tata Consultancy Services
hen disruption knocks, opportunity is always close behind. The rise of digital technologies has completely upended industries, companies, and consumers, throwing open abundant possibilities to redefine every aspect of business. We call this transformation Business 4.0.

Business 4.0 is the next wave of change breaking over organizations across the world. Digital technologies such as the cloud, the internet of things (IoT), analytics, automation, robotics, and artificial intelligence (AI) are vital enablers of this transformation, but it is not enough to use these to simply mechanize existing functions.

Instead, firms are using technology as a foundation for four critical business behaviors that will help them move to the next level:

- **Driving mass personalization** – personalizing products and services to a market of one customer, often even of one transaction, and at scale
- **Creating exponential value** – adopting business models that leverage value from transactions at multiple levels and address new markets
- **Leveraging ecosystems** – collaborating with partners inside and outside the supply chain to create new products and services
- **Embracing risk** – moving beyond rigid planning and operational barriers with an agile strategic approach

TCS’ global research study – based on a survey of 1,231 senior executives across industries – shows the way forward by helping organizations benchmark their progress against peers.
We surveyed 1,231 respondents from firms across 11 industries and 18 countries, the latter including Australia, Brazil, Canada, France, Japan, Mexico, Singapore, the US, and the UK. The survey was conducted over November and December 2018.

All respondents were either directly involved in or were aware of their firm’s digital transformation plans. Almost half of the respondents (42%) were from the C-suite, while the rest were manager level and above. All firms included in the survey report had annual revenues of at least $500 million.

In addition, we conducted in-depth interviews with 30 experts and business leaders from across industries worldwide to get their perspective on Business 4.0 and how it is driving performance within their organizations.

Please see the 'Demographics at a glance' charts at the end of this report for more details.
any organizations have embarked on a digital transformation journey, but most are yet to realize its full potential. Some understand that adopting digital technologies is not enough to reap rewards, that it requires a rethink at the strategic level. The most successful have been quick to adapt their business strategies to take advantage of the limitless possibilities that digital offers.

To understand how the dramatic impact of digital technologies is playing out in the fast-changing business landscape, we surveyed 1,231 senior executives worldwide and conducted detailed interviews with 30 senior executives from across industries. Analysis of the findings has helped us identify a select group of Business 4.0 leaders, the benefits they are realizing, and the barriers they are encountering in the pursuit of their aims.

The study found that the 9% of organizations that have adopted all of the Business 4.0 behaviors (the ‘leaders’) report and anticipate stronger financial performance than those that have yet to adopt any of the behaviors (the ‘followers’).

We have identified three distinct groups in the survey, based on their adoption of Business 4.0 behaviors:

- **Leaders**: 9% of respondent organizations that have adopted all four behaviors
- **Early adopters**: 82% of organizations that have adopted one, two, or three behaviors
- **Followers**: 9% of organizations that have adopted none of the behaviors
Progress is most evident in personalization. Offering more personalized services to customers, our study finds, is the most prominent business benefit derived from digital. In contrast, most struggle to drive exponential value and embrace risk.

Benefits are building, but not for all. Organizations report a wide range of business benefits from adopting Business 4.0 behaviors. Chief among these are increased revenue, higher profitability, access to new markets, and stronger customer relationships. More leaders are generating gains in these areas than the rest of the survey group, and many more than followers.

Business 4.0 leaders are also technology leaders. The results reveal a strong link between Business 4.0 maturity and technology adoption. The leader group is far more likely to have developed capabilities in automation, AI, IoT, and blockchain, for example.

Size matters. The larger firms in the survey are considerably more likely than smaller ones to have adopted the four behaviors. Their greater resources to support technology adoption matter, of course, but more important may be their ability and need to scale new capabilities across multiple business units and geographies.

Some sectors and regions are edging ahead. Banking and telecom firms perform strongly, while manufacturing and retail and CPG firms are catching up. North American firms are the regional leaders in mass personalization, while Latin American (LATAM) firms are slightly further ahead in driving exponential value and embracing risk.

Other key findings of the study:
Behaviors of Transformation
Business 4.0 leaders boast four unique attributes. Using digital technologies, they personalize transactions at the individual level, even for single transactions, and they do so at scale. This enables them to improve customer experience and earn higher revenues. They have developed business models that allow them to create multiple levels of value – for example, by offering services or data in addition to products – and to expand their addressable market.

The leaders in our research also collaborate actively with multiple players in ecosystems to share data and ideate in the process, develop new products and services, and improve their innovation capabilities. Last but not least, they are agile and ready to take risks, including fundamentally changing their business model. As we show below, they are realizing clearer gains from such behaviors than early adopters and followers.

**Leader Distribution by Industry, Geography, and Size**

The leader group is fairly evenly distributed across most of the industries covered in the survey, with banking and financial services and telecom accounting for the largest shares. European respondents comprise the largest proportion of leaders, followers, as well as early adopters.

The larger firms in the survey (those earning annual revenue of $1 billion or more) feature prominently among the leaders. Although larger in scale and therefore less flexible than smaller firms (most of the larger firms, for example, work to long-term business plans with fixed resources), they have greater resources to support technology adoption and change programs. More importantly, they have the ability and organizational experience to scale to new capabilities and technologies across what are often global businesses with multiple divisions and units.

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Please note that the composition of the leader group is influenced by variations in sample size for different demographics, particularly on a regional level.
Groups by industry

- Travel and hospitality
- Life sciences and healthcare (including pharmaceuticals)
- Telecom
- Retail and CPG
- Manufacturing
- Insurance
- Banking and financial services

Groups by region

- Asia-Pacific
- LATAM
- Europe
- North America
Figure 1: Business 4.0 leaders by revenue, industry, and region

Groups by revenue

- **Leaders**
  - More than $5 billion: 30%
  - $1.1 billion to $5 billion: 29%
  - $500 million to $1 billion: 41%

- **Early adopters**
  - More than $5 billion: 18%
  - $1.1 billion to $5 billion: 55%
  - $500 million to $1 billion: 27%

- **Followers**
  - More than $5 billion: 21%
  - $1.1 billion to $5 billion: 54%
  - $500 million to $1 billion: 25%
Driving the returns

A compelling finding from our survey is that our leaders’ efforts are clearly paying dividends for them. The responses indicate that leaders have been able to crack the code when it comes to mass personalization, creating new value, leveraging ecosystems, or even embracing risk. This suggests that they know precisely how and where to deploy digital technologies and which processes to change to capitalize on them.

As a result, the leaders are able to maximize their returns. For example, a remarkable 60% of leaders – substantially more than early adopters or followers – expect greater than 10% revenue growth over the next three years (see Figure 2).

Leaders are more likely than early adopters or followers to boost customer profitability from their personalization efforts (78% of leaders versus 60% of early adopters and 35% of followers), and to boost their revenue through participation in collaborative ecosystems (57%, 43%, and 27%, respectively). Leaders are also more agile, and more likely to launch new products or update existing ones quickly. Adopting the full combination of Business 4.0 behaviors, then, appears to boost the likelihood of achieving superior financial and operational results.
Figure 2: Revenue growth over the past three years and expectation over the next three years – leaders, early adopters, and followers
It is encouraging that the majority of firms in our survey have adopted at least one of the Business 4.0 behaviors (see Figure 3). Many, however, will be operating at the beginning of the maturity curve for each behavior. For example, 68% of organizations are yet to introduce agile practices – integral to embracing risk as well as other behaviors, and key to establishing a culture that is conducive to transformation – beyond the limited spheres of their operations. Seventy percent of leaders, in contrast, say agile underpins ‘every process in their organization’ today. A little over half (55%) of the overall survey group are currently utilizing the cloud extensively, and a whopping 90% expect to do so by 2021.

**Figure 3: Percentage adoption of Business 4.0 behaviors**

- **We can customize products and services to every transaction (mass personalization)**: 78%
- **We collaborate with multiple partners in our network to create new products and services (leveraging ecosystems)**: 54%
- **We operate a business model that drives exponential value**: 36%
- **We plan to transform our business model within one year (embracing risk)**: 33%
Businesses are gearing up to meet the rising demands of the digital customer. This has required a strategic shift in business strategy. No longer is it enough to cater to different market segments; firms instead need to focus on the segment of one customer and often a single transaction. Market segmentation is giving way to personalization.

Furthermore, as K. Ananth Krishnan, CTO at TCS, clarifies, mass personalization should not be restricted to a one-time experience, product, or service. A business should be able to do this all the time, on a per transaction basis.

“Mass personalization is probably the next evolution of real customer service,” says Adam Warne, CIO of UK retailer N Brown. “It is the thing that makes customers feel loved by a brand.”

A majority of businesses have realized the need to pursue mass personalization, with over three-quarters saying they are able to customize to individual transactions. For most of those firms, personalization is having a positive impact on their bottom line, and for some it is helping to reduce customer churn (Figure 4).

**Benefits achieved through mass personalization**

- Higher customer profitability: 60%
- Increased value of customer transactions: 59%
- Increased volume of customer transactions: 58%
- Reduced customer churn: 32%

*Figure 4: Percentage of respondents securing benefits of mass personalization*
lightly more manufacturers and insurance providers (83% in both cases) than organizations in other industries are pursuing mass personalization. Many types of manufacturers (such as automotive producers) have a lot of experience in customizing products to individuals’ preferences, and are now using digital to fine-tune that capability. Personalization is also more widespread among North American firms (84%) than those in other regions.

It is clear, however, that even these firms can do much more to sharpen the focus of personalization. For example, they are more likely to design personalized offers based on analysis of past purchases than on pre-browsing activities or data sourced from third parties (see Figure 5), which suggests they are primarily reacting to past preferences rather than anticipating what the customer might want in the future. This is more confirmation that most firms are in early stages of Business 4.0 maturity.

**How businesses gauge customer preferences**

<table>
<thead>
<tr>
<th>Method</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analysis of purchases made from us in the past</td>
<td>63%</td>
</tr>
<tr>
<td>Research with customers (such as surveys or focus groups)</td>
<td>60%</td>
</tr>
<tr>
<td>Data on customer behavior from third parties</td>
<td>49%</td>
</tr>
<tr>
<td>Pre-purchase browsing behaviors</td>
<td>41%</td>
</tr>
</tbody>
</table>

*Figure 5: Methods used by organizations to personalize offers*
Automotive manufacturers have not been slow to understand the value that digitally-enabled personalization can create for their businesses. Several original equipment manufacturers (OEMs) offer customers the ability to tailor the cars they are purchasing to a high degree.

Many, for example, have harnessed technologies such as cloud and mobile applications to enable consumers to browse vehicle configurations online and build their ideal car – from the engine specifications right up to upholstery and accessories.

“Our products are highly complex and highly configurable, so our customers can play with vehicle configurations and pick whatever they want,” says a senior executive of one automotive OEM who was interviewed as part of this research. “They can choose from many different options for interiors, colors, engines, transmissions, and multi-media systems. We have grown the value of our global brands by extensively improving the level of personalization for each customer.”
Creating exponential value
Companies create exponential value by using digital technologies to develop new revenue streams and expand their addressable markets. As a result, they create multi-layered benefits that delight their customers and differentiate them from the competition.

Consider, for example, a brick-and-mortar retailer partnering with e-tailers to offer its stores as pick-up points for online shopping, thereby increasing footfall at its physical locations. A search engine can monetize a free service by leveraging the data it gathers. Tapping the power of the cloud, data analytics, and IoT, among other technologies, can help companies unlock value at multiple levels.

Meanwhile, servitization – augmenting or replacing the sale of goods with the provision of services – is an important means of creating new value for manufacturers. An example is provided by Bridgestone Corporation, the world’s largest tire and rubber company.

“We are moving from a company that provides tires as spare parts to helping customers improve productivity and reduce downtime by offering tires as a service, driven by insights from data analytics, which will, undoubtedly, extend our reach beyond our legacy business to emerging and service-oriented domains,” says Yukio Saegusa, Vice-president and Chief Digital Officer of the firm. “We create value for our customers, but it also means we are operating at the front of the value chain, rather than competing downstream.”

The leaders in our survey have been quick to spot this opportunity, but others are also internalizing this Business 4.0 behavior, albeit at a slower pace. More than one in three organizations surveyed said they are already reaping the exponential value from their initiatives and transactions. Moreover, half of them expect to be doing so within the next three years.
Overall, the adoption of this behavior has progressed furthest among the insurance providers and telecom firms in our survey. Insurers, for example, have augmented their core revenue streams from premiums with revenue generated from car maintenance, health monitoring, and other complementary services.

Our survey found that companies are finding exponential value at a more granular level than just the bottom line (see Figure 6). Some are using digital technologies to target a wider range of customers or — in other words — find new markets. Others are creating value through collaboration with partners in ecosystems — by sharing customer data, for example.

It is worth noting that reducing costs is well down the list of sought-after benefits from this behavior, supporting a view that creating new value is top-of-mind for businesses that are shifting to Business 4.0.

Benefits gained from operating an exponential value model

- Ability to target a wider range of potential customers: 64%
- An expanded geographical marketplace: 62%
- Higher profitability: 54%
- Higher revenues: 50%
- New business models through collaborative ventures: 50%
- Competitive advantage with better differentiation: 31%
- Reduced central costs: 29%

Figure 6: Percentage of respondents gaining range of benefits from an exponential value approach
PostNord, a state-owned communications service provider in Sweden, has expanded its portfolio to offer logistics solutions to, from, and within the Nordic region. It is developing a new warehouse service concept called ecNOW, aimed at smaller e-commerce operators who may be in their early phase but have become too big to store goods on their premises. They need a logistics setup, including a warehouse, a distribution network, and everything that surrounds them (including a customer support system), which can be expensive.

PostNord’s idea is to set up a standardized approach where companies can buy warehouse space along with supplementary services. It can provide a standard service for many small e-commerce companies, creating huge economies of scale while leveraging existing space and infrastructure.

Björn Ekstedt, Group CIO, explains: “At the end of the day, we would like this to be something that you can order via the customer portal. An e-commerce company just goes in, orders the warehouse solution they want and off they go. Very uncomplicated.”

This additional service will have exponential benefits: better customer value, advantages of scale, better utilization of existing infrastructure, and increased demand for core services.
Leveraging Ecosystems

4.0 MULATE
A COLLABORATION PLAN
Businesses increasingly collaborate with multiple partners – within and beyond their supply chain networks – to bolster their innovation capabilities and create new products and services, in the process providing greater customer value. Among the surveyed industries, the largest numbers of firms adopting this behavior are found in the health and life sciences, telecom, and manufacturing industries, although the practice is widespread in all seven.

Auto manufacturers, for example, partner on digital platforms with consumer electronics producers, entertainment firms, telecom companies, and other service providers to support connected car offerings. Banks and insurers use application programming interfaces (APIs) to share data that can be used to create new financial services.

Japan Airlines is a good example of a transportation business that is taking part in wide-ranging ecosystems. “To cover all stages of the customer journey, we have to create ecosystems with other industries and organizations,” says Tomohiro Nishihata, the airline’s Executive Officer for Innovation. “On our website, we partner with up to 70 different companies to provide services such as accommodation and shopping.”

— Tomohiro Nishihata, Japan Airlines’ Executive Officer of Innovation
he ability to leverage ecosystems is the second most likely behavior to be adopted after mass personalization. And yet, there is some distance to go before firms derive maximum value from it. As K. Ananth Krishnan from TCS says, most companies – even those that can create small ecosystems – “struggle to dynamically configure ecosystems for the customer’s needs. Building a large ecosystem is also a challenge, as most companies usually have no more than a few dozen partners in their ecosystem.”

Those in the survey are, for example, notably less likely to collaborate with competitors or acquire start-ups to boost innovation than they are to work with existing supply chain partners – despite the benefits that can be derived from these strategies (see Figure 7). For many, risk-aversion and fear of the unknown may be holding them back from such bold initiatives.

**Figure 7: Methods used by organizations to leverage ecosystems**

- We collaborate with multiple partners in our network to create new products and services: 54%
- We access a dispersed workforce or the gig economy when we need to boost our skills base: 46%
- We harness networks of assets (that we do not own) to create new services: 43%
- We acquire start-ups to improve our innovation capability: 37%
- We collaborate with competitors to create new products and services: 30%
- We do not currently leverage our organization's wider ecosystem but we plan to in future: 5%
- We have no plans to leverage our organization's wider ecosystem: 2%
onetheless, there are powerful reasons for businesses to take a bolder approach to their ecosystems. Firms that have leveraged them to develop new products and services report that it has helped them increase revenues and access new markets (Figure 8). Other benefits include the ability to trial and develop new products and services, perhaps reflecting the challenge of adopting a disruptive mindset from within the confines of an organization that also needs to maintain the status quo, along with reduced risk during the innovation process.

Leveraging ecosystems also helps address the skills shortage that many businesses are currently struggling with, as it can provide access to different types of skillsets that the core organization lacks. As the demand for digital-related skills grows across sectors, creating structural unemployment in economies worldwide, we can expect more and more organizations to tap into ecosystems to augment their talent base.

<table>
<thead>
<tr>
<th>Benefits of leveraging wider ecosystems</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Higher revenues</td>
<td>44%</td>
</tr>
<tr>
<td>Access to new markets</td>
<td>43%</td>
</tr>
<tr>
<td>Ability to develop more innovative products and services</td>
<td>41%</td>
</tr>
<tr>
<td>Ability to act faster to satisfy customer demand or perceived</td>
<td>39%</td>
</tr>
<tr>
<td>appetite for new products or services</td>
<td></td>
</tr>
<tr>
<td>Access to different skillsets</td>
<td>35%</td>
</tr>
<tr>
<td>Reduced risk when developing new products and services</td>
<td>33%</td>
</tr>
<tr>
<td>Trialling new products and services in partnership with a</td>
<td>31%</td>
</tr>
<tr>
<td>third party</td>
<td></td>
</tr>
<tr>
<td>Bundle offerings with third-party providers</td>
<td>30%</td>
</tr>
<tr>
<td>Tap external resources to scale our business</td>
<td>30%</td>
</tr>
</tbody>
</table>

Figure 8: Percentage of respondents who are securing a range of benefits by leveraging ecosystems
Embracing Risk

4.0 TUNE
FAVORS THE BRAVE
The ability to fail fast reduces the magnitude of risk and contains its impact.

Noting that playing it safe has its limitations in business, Girish Nayak, Chief of Customer Service, Operations, and Technology at ICICI Lombard General Insurance, says, "If you want to be ahead of the rest, you need to try something new."

Developing an entirely new product, making an acquisition, changing the business model, or any other major initiative all involve risk to some degree. Failure to do so can damage the business, opening it up to disruption by firms that are willing to experiment with new business models or implement unconventional approaches.

After all, digital technologies have made it easier than ever for organizations to embrace risk. Agile methodologies, cloud, automation, and AI are all examples of tools and approaches that help businesses to reduce the time – and often resources – needed to test new products or ideas. In the words of K. Ananth Krishnan:

"If there are shorter cycles from idea to execution, organizations can change course and adapt to shifting circumstances much better than somebody with a very inflexible timeline that runs into months or years."

Despite this, embracing risk is the Business 4.0 behavior that is least likely to have been adopted by surveyed organizations. The reason for this is straightforward. Embracing risk across planning, product marketing, and research and development (R&D) – especially while fulfilling existing commitments to customers, employees, and other stakeholders – requires a fundamental change in strategic thinking that is easier to talk about than achieve in practice.

"Embracing risk is the most difficult behavior for organizations to understand and implement," explains K. Ananth Krishnan. "How they need to change their operations, their culture, or their business model to truly embrace risk is a major challenge to most businesses."
Nothing less than a change in mindset is required, notes a senior R&D executive from a global pharmaceutical company. "Many pharmaceutical companies have established a dedicated innovation group tasked with pushing the envelope on how to collect clinical trial data more quickly and more cost-effectively," he explains. "The challenge lies not just in creating new processes, but in gathering support within the company to scale these new processes on a broad basis."

“For us as a pharma company,” the executive adds, “learning to embrace risk that comes with novel approaches and technologies, in addition to the large risk inherent in the overall drug development process, will be a behavior I can see translating into a competitive advantage.”

One form of risk-openness that the most successful brands demonstrate is the flexibility in business planning, which means they can constantly adapt to changing customer demands and market conditions when planning ahead. Adopting agile methodologies across the enterprise – not just in IT, where the approach was pioneered as a way to develop software through incremental, iterative sprints – is one way to create this flexibility. Firms must be able to shift course quickly when circumstances change, be they initiatives at risk of failure or market opportunities that arise, and agile gives them the means to do so.

As Krishnan Ramanujam, President, Business and Technology Services, TCS, notes, “Agile is not just a way of implementing technology. It is a new operating model; a way of running your business by adopting agile ways of working, a fail-fast, minimum viable product approach to engineering and a product-centric approach to business.”

Relatively few of the surveyed firms can currently point to high levels of planning flexibility within their businesses. Most still operate within multi-year planning cycles (see Figure 9), which is far from ideal considering the speed at which entire industries can be transformed. The positive news, however, is that there are indications that this is set to change: a third of surveyed firms, for example, plan to change their business models to meet changing customer requirements within the next year; half plan to do so within three years (see Figure 10).

"The world is so fast now that opportunities just come at you. We need to create a business agile enough to respond to those opportunities as and when they arrive."

- Adam Warne, Chief Information Officer, N Brown
**Figure 9:** Percentage of respondents who are moving toward more agile planning

- **We work to three-year planning cycles with finite resources and budgets allocated**: 38%
- **We work to five-year planning cycles with finite resources and budgets allocated**: 22%
- **We plan for the year ahead with finite resources and budgets allocated**: 18%
- **We plan for the year ahead but are flexible on resources and budgets depending on market conditions**: 13%
- **We adapt and transform continuously to market conditions, making resources and budgets available as needed**: 9%

**Figure 10:** Organizations’ willingness to adapt business models

- **Yes, within three years**: 47%
- **Yes, within one year**: 33%
- **We have no plans to change our existing business model**: 10%
- **Yes, within five years**: 10%

**Organizations’ appetite for risk when planning ahead**

- **We work to three-year planning cycles with finite resources and budgets allocated**: 38%
- **We work to five-year planning cycles with finite resources and budgets allocated**: 22%
- **We plan for the year ahead with finite resources and budgets allocated**: 18%
- **We plan for the year ahead but are flexible on resources and budgets depending on market conditions**: 13%
- **We adapt and transform continuously to market conditions, making resources and budgets available as needed**: 9%
As they consider whether to reset their approach to risk, firms should remember that embracing risk in business planning brings a wide range of commercial benefits to organizations, including higher productivity, stronger business sustainability, faster time-to-market, and lower commercial costs. Openness to risk also enables organizations to operate more dynamically: almost half of those who have adopted flexible planning say they have improved their ability to innovate and translate ideas into new products, while four in 10 can give product teams more autonomy (see Figure 11).

Figure 11: The benefits achieved by embracing risk
In a fast-changing environment, with disruptive technologies offering new opportunities for efficiency measures and improvements in citizen engagement, public sector institutions are struggling to adapt. Budgets are tight, while the lack of talent with specialized skills further complicates matters.

The Mississippi Department of Employment Security has discovered a way to overcome these challenges and turn them to its advantage by adopting one of the key change behaviors – embracing risk. Taking a leap, it was the first among US state government agencies to migrate its unemployment insurance system to the cloud.¹

Mohammed Jalaluddin, Director of the department’s Office of Technology Support and Innovation, relates that the initiative required dealing with large amounts of data transmitted between the Federal agencies. Both follow stringent rules on security and data protection, and neither had previously managed such data in the cloud. Two years of working with the agencies, he says, helped the department learn about how cloud services could be used in the public sector.

“As a result,” says Jalaluddin, “we eased a lot of apprehension around data security and set the precedent for other states to follow. We blazed a trail of our own.”

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Technologies to Support Change
The adoption of Business 4.0 behaviors is enabled by the development of strong digital capabilities, as we have emphasized throughout this report. Managing IT applications and infrastructure on the cloud, automating business processes, generating unique customer and market insights from data, and using sensors and AI to anticipate events and respond in real time, all provide the foundations for businesses to transform their operations and seize new opportunities.

The cloud priority

Cloud is becoming the building block for all advanced digital capabilities. For example, an IoT ecosystem that generates burgeoning volumes of data is sustainable only when backed by the limitless storage capacity of cloud. Similarly, many AI-based applications require the cloud’s vast number-crunching power to generate and act on insights. “Cloud is definitely helping us scale and grow our business,” confirms one of the senior executives we spoke with as part of the research.

Companies understand what cloud means to their ability to compete in the digital era, and most are in the process of migrating their IT operations to that environment. The Business 4.0 leaders, however, have been much more determined than the rest of the survey group in their development of IoT, AI, and other digital capabilities.
It is also worth noting that leaders appear to accord broadly equal priority to the use of cloud and development of IoT, AI, automation, and blockchain capabilities (see Figure 12). This suggests a conviction that the use of all these capabilities will drive better outcomes for their business than using one or two.

**Figure 12: Adoption of digital technologies and capabilities by leaders, early adopters, and followers**
Organizations that utilize a cloud environment have seen significant benefits from its use, including an improved ability to analyze data, better data security, and lower operational and capital costs. Other positive outcomes include the ability to update or launch new products more quickly, as well as flexible access to processing power.

**Newer, more disruptive tools**

Every organization in the survey will manage IT on the cloud by 2021, but there will also be a significant push to develop greater capabilities in emerging and disruptive technologies such as AI, IoT, and blockchain.

According to Pratik Pal, Global Head of Retail, Consumer Goods, Travel, Transportation, and Hospitality at TCS, the ability to leverage data, in particular, will set successful companies apart from not-so-successful ones. “Technologies such as artificial intelligence and machine learning have the potential to create significant impact on businesses that understand that data is the competitive advantage,” he says.

We can also expect to see organizations pushing automation technologies further out into the enterprise to encompass more front- and back-office processes in customer service, finance, human resources, and other functions. According to Adam Warne of N Brown, automation technologies – a current investment priority for the retailer – will remove friction from processes and enable new business models to operate seamlessly. “More importantly, we’ll be able to take manual tasks away from people and let them use their minds more.”

As illustrated by Figure 13, we also see variations in response by region and industry segment. For the geographic variations, we would note that there was a higher preponderance of telecom respondents in our LATAM sample, which may have impacted the results as telecom respondents are also more likely to appear in the leader group.

“The ability to leverage data, in particular, will set successful companies apart from not-so-successful ones.”

— Pratik Pal, Global Head – Retail, Consumer Goods, Travel, Transportation, and Hospitality, TCS
Figure 13: Adoption of digital technologies and capabilities by region and industry
Inculcating agile practices widely throughout the organization complements the implementation of the aforementioned technologies and gives businesses the best chance of translating their new capabilities into Business 4.0 attributes.

It is no coincidence that 70% of the leader group claim that agile underpins every process in their organization, compared with only a third of the overall survey sample and 14% of followers.

By adopting agile as an operating model, companies can improve speed-to-market and allow themselves to fail fast if needed, making it easier for them to embrace risk. Agile practices are particularly powerful when combined with automation. This embodies the Machine First™ approach: designing any new processes – or redesigning and simplifying existing ones – with digital technologies as the default vehicles for process execution. “Agile and Machine First are the yin and yang of Business 4.0,” Krishnan Ramanujam of TCS points out.

### Figure 14: Adoption of agile practices by company size

<table>
<thead>
<tr>
<th>Category</th>
<th>$500 million to $1 billion</th>
<th>$1.1 billion to $5 billion</th>
<th>More than $5 billion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agile underpins every process in our organization</td>
<td>24%</td>
<td>36%</td>
<td>51%</td>
</tr>
<tr>
<td>We have adopted agile in small pockets of our organization</td>
<td>47%</td>
<td>47%</td>
<td>35%</td>
</tr>
</tbody>
</table>
The idea of the steady state in business is a thing of the past, believes Brad Clay, Chief Information and Compliance Officer at Lexmark International. “There is a period of intense change followed by a phase of stability, followed by another period of intense change,” he explains. “The most difficult thing is helping people think differently about change when they are used to business-as-usual lasting for 10 years.”

People — their reluctance to change and, in the case of senior management, their failure to lead and provide the right level of support — are among the biggest challenges organizations face in making a success of major business initiatives.

It is no different, we find, when organizations seek to develop Business 4.0 behaviors (see Figure 15).

When it comes to embracing risk, for example — the toughest of the four behaviors to embed — traditional corporate culture is seen as the principal impediment for organizations. As company cultures are inevitably personified to some degree by the actions and attitudes of the organization’s top team, when senior leaders are personally reluctant to live an open-to-risk mindset, it has a bearing on how the rest of the workforce behave.

Correspondingly, our research also finds that a lack of senior leadership looms large as an additional barrier to adoption of all the behaviors.

<table>
<thead>
<tr>
<th>Behavior</th>
<th>Biggest barrier to adoption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Driving mass personalization</td>
<td>35% Inflexible or outdated technology</td>
</tr>
<tr>
<td>Creating exponential value</td>
<td>38% Risks to data security</td>
</tr>
<tr>
<td>Leveraging ecosystems</td>
<td>36% Risks to data security</td>
</tr>
<tr>
<td>Embracing risk</td>
<td>36% Traditional corporate culture</td>
</tr>
</tbody>
</table>

Figure 15: Percentage of respondents who identified specific barriers for each behavior.
Working in a cloud environment can give organizations access to a wide variety of affordable solutions that may previously have been beyond their reach. Cloud also need not pose insurmountable security issues. Over half of survey respondents (and more than half of leaders) maintain that migrating operations to the cloud has served to improve their security.

The same time, technology-related factors hinder organizations in more specific areas (see Figure 16). Data security concerns, for instance, appear to hold many firms (38%) back in seeking to develop new revenue streams (including from the sale of data) that create exponential value. The same concerns give organizations pause when sharing data and ideas with partners in collaborative ecosystems. When developing mass personalization capabilities, inflexible or outdated technology is the main culprit when progress stalls.

Ultimately, only new investments can resolve the challenge of obsolete technology, but the cost of doing so is falling in some areas.

Figure 16: Percentage of respondents citing lack of leadership as the biggest barrier to adopting Business 4.0 behaviors
arneSing abundance

“All along, businesses have been run under the paradigm of scarce resources allocated optimally to solve a business problem and deliver value,” explains Krishnan Ramanujam from TCS. “Thanks to digital technology, we have a great opportunity to move to a paradigm that turns the optimizing for scarcity idea on its head and shifts to a harnessing abundance paradigm. In this approach, we think, ‘What is in abundance that I can use to solve this business problem?’ That abundance could be in the form of talent, capital, or most often in our context, data.”

Executives often state that talent shortages thwart their best-laid plans to bring about technology-enabled change. Our survey group is no exception, with many stating that a dearth of in-house analytics skills hampers their efforts to drive personalization.

A skills gap is seen as a tougher obstacle to digitalization itself than limited budgets and siloed technology.

The leadership of Business 4.0 organizations should be able to use a flexible mindset to surmount such difficulties. Accessing needed skills, funding, and other resources within their ecosystems is one such approach. “You’re never going to have enough resources to do everything you need to,” notes one senior executive. “Organizations must work with the ecosystem and think differently about how to get these things done.”
To access resources such as talent and capital, the Business 4.0 world requires a shift in mindset – from focusing on scarcity to harnessing the abundance of talent and other resources that ecosystems can provide. “Competition to access the best talent, whether in product development, manufacturing, or ICT, is becoming a major strategic challenge,” says a senior executive we interviewed at a global auto-maker. “In that context, a Business 4.0 approach is likely to be effective in enabling greater speed and scalability.”

**Figure 17:** Resources accessed today by leaders, early adopters, and followers
Key Takeaways
Our research paints a positive picture for businesses and their digital ambitions. Specifically, our research indicates that Business 4.0 behaviors will be taken up more widely by organizations in the coming months and years. Half of the survey respondents expect to change their business model within the next three years (joining the third that have already done so) with the intention of expanding their addressable markets.

After all, becoming a Business 4.0 organization takes time. Many of the businesses this study covered took their first steps toward digital transformation several years ago – or are in the process of implementing new business models.

The more decisively they move toward Business 4.0, however, the surer they can be of earning returns.

Our research brings attention to the correlation we see between taking action on Business 4.0 and the ability to deliver business success.

It is telling that our leader group – the firms that have made the most progress in adopting the four behaviors – has realized the greatest business benefits, including better financial performance, thereby demonstrating cumulative and ongoing improvements.
The organizational barriers to embracing Business 4.0 transformation are linked to mindsets, cultures, and technologies from the past. Recasting each of these can be a massive change management exercise, but critical nevertheless, to success. Old-style command and control structures cannot support the responsiveness or the speed-to-market demanded by today’s consumers.

The change has to begin at the top. A different style of management is needed to pull off a successful Business 4.0 transformation – one that empowers individuals, enables collaboration and harnesses their initiative and creativity to consistently innovate, deliver superior customer experiences and create value at scale. In such organizations, large, complex problems are broken down into smaller bits that multiple small, self-organizing teams address in a collaborative, iterative way on an ongoing basis. We call this Enterprise Agile.

When confronted with legacy technology, forward-thinking organizations are embarking on holistic, multi-year core transformation initiatives encompassing operations, systems and underlying infrastructure, to create lighter, smarter and more responsive operational stacks. They are leveraging ecosystems by embracing the cloud, open architectures and exposing application programming interfaces (APIs) to partners, while putting in place, robust cybersecurity safeguards.
Five lessons gleaned from the research can guide executives as they steer their organizations toward the Business 4.0 world:

**Ecosystems will not deliver without genuine collaboration.**
In the digital era, fewer businesses – even the world’s largest – can succeed by relying entirely on their own resources. Tapping into what ecosystems have to offer requires modifying or even discarding proprietary approaches toward sharing data and ideas. Working together, organizations can effect industry change that removes regulatory barriers and increases trust in new processes that use technologies such as robotics.

“In today’s world, a company does not exist as a standalone,” explains Girish Nayak, Chief of Customer Service, Operations, and Technology at ICICI Lombard General Insurance. “You need to integrate with the larger ecosystem that you are a part of. And you need to do this seamlessly in a digital manner.”
Agile is not just for IT.

Although agile practices were initially applied in software development, business leaders now see its advantages across the enterprise. The merits of fail-fast approaches to risk and cross-team working are difficult to dispute in virtually any sphere of operation. Many of the organizations that are already on the road to Business 4.0 have found that adopting agile methodologies gives them quick wins that prove the case for further transformation.

“Agile sets us up in a way that we’re in a cycle of continual improvement,” says Tobi Cates, Administrator at the Office of Workforce Programs for the Wyoming Department of Workforce Services. “For us, as a government organization, agile is truly key to how we begin to reform. I think it can start in small pockets, because then it will have exponential growth. Agile can overlay everything: it doesn’t just apply to the technology world.”
leadership from the top is non-negotiable. Business 4.0 behaviors will not take root if practiced in one or two functions of the organization. Strong senior leadership is required to cultivate them widely, otherwise the endeavor will fizzle out.

“Innovation and transformation have to be driven from the top down, as they require dedicated teams and budgets,” says the senior R&D executive for a major pharmaceutical company. “It’s not something that you can do in parallel to your day job, because when the going gets tough, innovation will fall victim to the business priority of developing new medicines.”
industry-focused blinders must come off.
The blurring of boundaries separating industries means that competition today can come from anywhere. But so can useful lessons and best practices: your next business model may have been pioneered in a completely different industry. There is much to learn, for instance, from companies such as Uber and Airbnb, which understand how to harness abundance in resources rather than planning with finite resources in mind.

“We look at what other airlines are doing, but ideas and solutions can come from anywhere,” says Abdul Rahman Mohamed, former Chief Information Officer of Malaysia Airlines. “To retain customers and create new ones, you have to focus primarily on their experience with you. An open architecture helps to collaborate with ancillary businesses.”
The Machine First philosophy should guide Business 4.0 delivery. As organizations rethink and design new processes, analytics, AI, IoT, or automation technologies must be the default vehicle for process execution. How can you use technology to free people from mechanical tasks and allow them to focus on high-value ones? Design any new processes, or redesign and simplify existing ones, with technology as a priority – a Machine First approach.

“In 10-15 years’ time, a pharmaceutical business might look not unlike an IT company,” says the senior R&D executive for a major pharmaceutical company. “Already now one of our main activities is collecting data and making it accessible to a diverse group of experts, employing smart technology to make the best drug development decision at the earliest point in time. And while pharma is often seen as laggard when compared with other industries, we need to adopt existing technologies and ecosystems much quicker if we want to stay competitive and deliver value to our customers.”
### Demographics at a glance

1,231 respondents surveyed in total

**Region**

- Europe: 40%
- Asia-Pacific: 26%
- North America: 25%
- LATAM: 9%

**Countries:** Australia, Belgium, Brazil, Canada, China, Denmark, Finland, France, Germany, India, Japan, Luxembourg, Mexico, Singapore, Sweden, the Netherlands, the UK, the USA

**Global annual revenue**

- More than $5 billion: $53%
- $1 billion to $5 billion: 28%
- $500 million to $1 billion: 19%

**Sector**

- Travel and hospitality: 11%
- Life sciences and healthcare (including pharmaceuticals): 16%
- Telecom: 11%
- Retail and CPG: 16%
- Manufacturing: 15%
- Insurance: 15%
- Banking and financial services: 15%
Role and function

Job function

Business: Sales/marketing, Operations, HR, Finance

Involvement in digital transformation

I am directly involved in delivering one or more aspects of our digital transformation strategy/plans

I am aware of what our digital transformation strategy/plans involves but I am not directly involved in delivering it
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Tata Consultancy Services is an IT services, consulting and business solutions organization that has been partnering with many of the world’s largest businesses in their transformation journeys for the past 50 years. TCS offers a consulting-led, cognitive-powered, integrated portfolio of IT, business and technology services, and engineering. This is delivered through its unique Location Independent Agile delivery model, recognized as a benchmark of excellence in software development.

A part of the Tata group, India’s largest multinational business group, TCS has over 417,000 of the world’s best-trained consultants in 46 countries. The company generated consolidated revenues of US $19.09 billion for year ended March 31, 2018 and is listed on the BSE (formerly Bombay Stock Exchange) and the NSE (National Stock Exchange) in India. TCS’ proactive stance on climate change and award winning work with communities across the world have earned it a place on leading sustainability indices such as the Dow Jones Sustainability Index (DJSI), MSCI Global Sustainability Index and the FTSE4Good Emerging Index.

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