Driving Business Value with AI in the Data Cloud

How 100 Data and Analytics Leaders are Driving Business Results with Data Migration and AI Applications in the Cloud

Deloitte.

Corinium
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Executive Summary

This research highlights the strong links between cloud migration, AI maturity and business success in today’s disrupted global marketplace.

It reveals how the right cloud implementation roadmaps, data architectures, governance processes and cloud-native capabilities can set enterprises up for success in the post-COVID-19 world.

Then, it highlights what it takes to successfully execute an enterprise data and AI strategy in the cloud, which business units stand to benefit most from cloud-and AI-enabled capabilities and how embracing these technologies can lead to greater business returns.

What’s more, it explores how cutting-edge technologies including reinforcement learning, edge computing and natural language processing will shape the AI-driven enterprise of tomorrow.

Key Findings

98% of enterprises have accelerated their cloud migrations in response to COVID-19

41% of AI leaders expect their enterprises to be using edge computing technology by 2023

47% have adopted a multi-cloud strategy for data storage and management

71% are using AI to generate new revenue streams for their organizations

69% have deployed predictive or prescriptive analytics or AI models

82% say identifying the right problems to tackle with AI is at least ‘quite challenging’

Source: Corinium Intelligence, 2021
Methodology

This representative survey of 100 US-based data and analytics leaders was conducted in November 2020. All respondents are from enterprises with at least $500 million USD annual revenue and have job titles ranging from C-level to Director, VP or Head of Department. They were asked 14 questions about their organizations’ adoption of cloud technologies, AI maturity and future data and analytics investment plans.

We then combined our findings with commentary from five industry experts to put these unique insights into the cloud-enabled tools helping to create the AI-driven enterprise of tomorrow into context.

Contributors

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Managing Director and Data Modernization and Analytics Leader, Deloitte Consulting LLP
Many Enterprises Fast-Track Their Cloud Migrations in 2020

**KEY FINDING**

Cloud data migration surged in 2020. Almost 90% of enterprises now store at least some of their data in the cloud and 98% have accelerated their plans to unlock the business benefits cloud migration can yield.

Even before the events of 2020, enterprise cloud technology adoption was forecast to rise this year. But new research we have conducted shows that many organizations fast-tracked their cloud migration plans in response to COVID-19.

Of the 100 US-based data and analytics leaders we surveyed, 98% say the pandemic has accelerated their move to the cloud. In fact, 64% say they’re at least two years ahead of where they would otherwise be and 26% say they are now at least four years ahead of schedule.

A full 99% of our survey respondents say their enterprises now plan to move data into the cloud, and 88% of them have already done so.

“The pandemic has significantly accelerated the need for cloud-enabled business models,” says Ashish Verma, Managing Director and Data Modernization and Analytics Leader at Deloitte. “The cloud services market is now forecast to be worth $1 trillion USD by 2024, and it’s easy to see why.”

“The cloud has proved essential for enabling remote working and helping enterprises whose finances have been stretched this year to generate cost savings,” he continues. “It’s also the foundation on which businesses are building data-driven capabilities to meet evolving customer expectations.”

Dr Vlad Bacvanski, Principal Architect, Strategic Architecture at PayPal, agrees: “Companies realize that the offerings of cloud providers are getting not only on par but, in many ways, they are getting ahead of what they have or could deploy on-premise in their own data centers.”

“When an organization runs its own data center, it has to optimize for the maximum amount of traffic it will be handling. That requires it to over provision the resources”

Dr Vladimir Bacvanski
Principal Architect, Strategic Architecture, PayPal
Six Ways Enterprises Benefit from Cloud Migration

The perceived benefits of cloud data migration can vary depending on an organization’s size and the resources it has historically allocated to maintaining on-premises infrastructure. However, our research highlights six benefits that are widely acknowledged in the data and analytics community.

The ability to upgrade data or IT infrastructure more easily is the most frequently cited advantage of cloud data migration. Almost half of our survey respondents say this is a factor in their decision-making.

Cloud computing’s potential to yield cost saving and facilitate remote working tied as the second most frequently cited benefits, receiving 46% of the vote each. Meanwhile, 41% of respondents see the cloud’s ability to facilitate analytics and AI innovation as one of its key benefits.

“One of the promises of the cloud is elasticity,” says Dr Bacvanski. “You can ramp up your infrastructure to handle the additional workloads that the organization may have. Then, after the time of a heavy traffic is over, you can scale down and significantly reduce your operational costs.”

“The organization benefits from consolidating things into one place and not having staff allocated to do just management of infrastructure”

Dr Besa Bauta
CDO, MercyFirst
“Cost was the primary driver for moving our Electronic Health Records to the cloud,” adds Dr Besa Bauta, CDO at human services agency MercyFirst. “We don’t have the capacity or individuals to maintain on-premise infrastructure.”

The ability to easily scale infrastructure and the security improvements some enterprises can realize by moving to the cloud are the fifth and sixth most commonly cited benefits of the technology. Respectively, 31% and 21% of respondents cite these as key benefits of cloud migration.

While larger enterprises may typically trust their in-house cybersecurity teams over a third-party to keep their data safe, smaller enterprises may lack the resources to build robust security teams in-house. For these organizations, outsourcing this work to a cloud provider can be a natural choice.

**Using Cloud Migration for Data Modernization**

A key challenge for many cloud transformation leaders is how to deal with the patchwork of legacy applications they often inherit.

So, when an organization decides to move data to the cloud, they have a choice. They can either attempt to ‘lift and shift’ their on-premises data architecture and replicate it in the cloud. Or, they can use the migration as an opportunity to transition to a more modernized data architecture.

“I imagine most people usually do a ‘lift and shift’, as opposed to trying to re-engineer or rearchitect the system,” says Cetin Karakus, Global Head of Quantitative and Analytical Solutions at BP. “If you do the second one, it will become an engineering effort.”

Smaller organizations or business units may find they can replicate their on-premises architectures in the cloud. However, enterprises used to storing data in large, on-premises relational databases might find it hard to replicate their existing data infrastructure in the cloud.

Dr Bacvanski explains: “You need to look for a more clustered solution. But the consequence of that is, the architecture of your data layer needs to change. This is a common pain point that organizations face, also when they’re moving from their large monolithic applications to microservices.”

This reengineering challenge is one factor that may act as a drag on the trend of migrating data, apps and systems to the cloud. Despite the progress enterprises have made in recent months, just 37% of enterprises have more than half of their data in the cloud.

However, most cloud-focused leaders do have a plan for creating modern data architectures in the cloud. Our research shows that 59% have at least ‘largely dealt with’ the task of creating a strategy for cloud migration.

In the months ahead, we expect to see more enterprises building on their cloud migration momentum to execute these strategies and realize the benefits moving more data to the cloud can bring.
How Enterprises Will Use the Cloud Moving Forward

**KEY FINDING**

A quarter of enterprise data leaders say they are at least three years ahead of where they otherwise would be on their cloud migration journeys due to COVID-19.

### Almost All Enterprises Have Data in the Cloud

How much of your organization’s data is stored in the cloud?

- **4%** 76-100%
- **33%** 51-75%
- **22%** 26-50%
- **29%** 1-25%
- **11%** We plan to move some, but have yet to do so
- **1%** We have no plans to

### COVID-19 has Accelerated Enterprise Cloud Migration

What impact has the COVID-19 pandemic had on your enterprise’s cloud migration journey?

- **6%** We’re more than three years ahead
- **20%** We’re at least three years ahead
- **38%** We’re at least two years ahead
- **23%** We’re at least a year ahead
- **11%** Slightly accelerated our migration journey
- **2%** No impact

### Multi-Cloud is Emerging as the Dominant Approach

Which of the following statements is true of your enterprise’s existing data architecture? (Select all that apply)

- **43%** We store data or run apps in a private cloud
- **24%** We store data or run apps in a public cloud
- **47%** We have adopted a multi-cloud strategy

Source: Corinium Intelligence, 2021
Ensuring Cloud Migration Leads to AI and Analytics Success

**KEY FINDING**

*AI and analytics teams benefit most from the cloud. But data leaders must overcome three core challenges to deliver cloud migrations that set their enterprises up for AI success*

Migrating data to the cloud supports AI innovation in two ways. It breaks down data silos to give data scientists and algorithms easier access to data. Plus, it gives AI teams access to environments that facilitate quicker experimentation with new technologies.

Our research shows that accelerating AI adoption in this way is one of the primary reasons that enterprises embrace the cloud. Of the 100 data and analytics leaders we surveyed, 41% cite ‘enabling AI and advanced analytics’ as a key benefit of the exercise.

“Cloud providers give enterprises access to modern data management tools that accommodate unstructured and open source technologies,” explains Ashish Verma, Managing Director and Data Modernization and Analytics Leader at Deloitte. “Without these capabilities, it’s more difficult for enterprises to operationalize and scale AI tools effectively.”

PayPal Principal Architect, Strategic Architecture Dr Vladimir Bacvanski agrees: “If you are limited to what you can do in your data center, you would need to have a process in which you identify the AI vendor and then you make sure that this vendor’s solution will work in your ecosystem.”

“There will be some time where you need to install and put everything in place, and all of that can take significant amounts of time,” he adds. “During that time, your team would like to experiment and try out the new technology. They are essentially paralyzed.”

“[In the cloud,] the team that would like to try something out can do it essentially in a few minutes, as opposed to going through the whole procurement process”

Dr Vladimir Bacvanski
Principal Architect, Strategic Architecture, PayPal
Accelerating AI Innovation in the Cloud

One of the most basic ways enterprises can use cloud migration as a springboard for advanced analytics and AI capabilities is by creating a single place where they can store data from a wide variety of sources.

“This is the low hanging fruit,” says Dr Bacvanski. “This could even be built in-house. So, you have the ability to play with large volumes of data. You keep buckets of files and you essentially have a place where you can put a variety of data sources that can be then used by the AI systems.”

AI leaders have several options when deciding how to do this. For example, our research suggests that 24% of enterprises currently store data or run apps in the public cloud, 43% do so in a private cloud and 47% have adopted a multi-cloud strategy.

“A question I often get asked is, ‘Do organizations often have one cloud or multiple clouds?’” Verma says. “In reality, enterprises have multiple clouds. A key consideration in developing and executing a modern cloud strategy is to make sure that interoperability and interaction between one cloud and another is paramount.”

Many cloud providers also enable faster innovation by allowing data science teams to experiment with new technologies in cloud-based development environments. This is particularly useful for newcomers to the field who may struggle to set or operate these systems smoothly alone.

But of course, it’s still usually necessary to develop these capabilities in-house to deploy more complex AI models at scale.

“Without [cloud] capabilities, it’s more difficult for enterprises to operationalize and scale AI tools effectively”

Ashish Verma
Managing Director and Data Modernization and Analytics Leader, Deloitte
Three Cloud Migration Barriers to Overcome

Despite the various options available and the surge in demand for cloud services we saw in 2020, few businesses have fully embraced the technology. In fact, just 4% of enterprises currently have more than 75% of their data stored in the cloud.

Our research shows that ‘securing executive buy-in’, ‘understanding what data the enterprise has’ and ‘ensuring data privacy and security’ emerged as the top three barriers to cloud migration today.

Securing executive buy-in is a significant obstacle. Just 1% of our survey respondents have ‘completely dealt with’ this challenge, while 78% are finding it at least ‘quite challenging’ to get executives on-side.

“The way to get buy-in from different members of an enterprise is, understand what their pain points are for their projects,” recommends Dr Besa Bauta, CDO at MercyFirst. “The key is understanding the pain points of the different divisions and partnering with them.”

Concerns around how secure it is to store information in the cloud may be another factor that’s causing executives to hesitate on cloud migration. After all, 56% of our survey respondents state that ‘ensuring data privacy and security’ in the cloud is at least ‘quite challenging’.

“Executives can be hesitant to put sensitive data in the cloud for myriad reasons, including potential security concerns,” Verma says. “Hacks can erode public trust in an organization and cause serious reputational damage.”

To move data safely and securely into the cloud, data leaders must do their due diligence to ensure that a given cloud provider can be trusted to keep their data secure. Showing other executives there will be rigorous security measures in place will go a long way toward getting them ‘on-side’.

$8.19m

The average cost of an enterprise data breach in 2020

Source: IBM, 2020
AI Success Depends on Good Data Management

Besides the challenges of securing executive buy-in and ensuring data in the cloud is secure, 63% of our survey respondents say ‘understanding what data the enterprise has and where it’s kept’ is at least quite challenging within their organizations.

This highlights how tough data integration can be, especially for enterprises with many business units or companies under their umbrellas.

Historically, data leaders have attempted to address this challenge by creating centralized data lakes to acts as ‘single sources of truth’ for their organizations. But in recent years, we have seen a decline in this practice.

Our research shows that just 26% of enterprises are currently pooling data in a centralized lake. Meanwhile, 37% have an enterprise data catalog, 47% have data catalogs for each of their business units and 52% are using data virtualization to integrate data from multiple sources.

Enterprises that opt for a 'lift and shift' approach to cloud migration can sidestep this data discovery challenge by focusing just on replicating certain on-premises data stores in the cloud.

Yet, those that wish to use their cloud migrations as springboards for future AI initiatives must take steps to engineer a data infrastructure that arms their data scientists with the data and tools they need to succeed.

“The way to get buy-in from different members or an enterprise is, understand what their pain points are for their projects”

Besa Bauta
CDO, MercyFirst

 Enterprises Use Many Techniques to Aid Data Discovery

What is your enterprise’s approach to ensuring AI and analytics teams have access to the right data sources?

- **26%** One centralized data lake
- **47%** Data catalogs for each business unit
- **31%** Legacy enterprise search capability
- **60%** Point-to-point data integration using legacy systems
- **37%** One enterprise data catalog
- **52%** Using a data fabric (e.g. data virtualization)
- **37%** Enterprise knowledge graph
- **4%** We have no clear strategy for this

Source: Corinium Intelligence, 2021
Unleashing the Benefits of Cloud Migration

**KEY FINDING**

Cloud-focused data leaders must overcome common challenges to realize the benefits of cloud migration

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**Executives Worry About the Risks of Cloud Migration**

Please rate the following potential barriers to cloud migration as they apply to your enterprise:

- **Completely dealt with**
- **Largely dealt with**
- **Quite challenging**
- **Very challenging**

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<tr>
<td>Securing executive buy-in</td>
<td>0%</td>
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<tr>
<td>Understanding what data the enterprise has</td>
<td>20%</td>
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<tr>
<td>Aligning data and IT teams</td>
<td>20%</td>
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<tr>
<td>Securing budget</td>
<td>40%</td>
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<tr>
<td>Difficulty choosing the right vendors</td>
<td>40%</td>
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<tr>
<td>Ensuring staff have the right skills</td>
<td>60%</td>
</tr>
<tr>
<td>Lack of systems interoperability (and ‘vendor lock-in’)</td>
<td>60%</td>
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<tr>
<td>Lack of portability</td>
<td>80%</td>
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<tr>
<td>Ensuring data privacy and security</td>
<td>80%</td>
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<tr>
<td>Creating a data migration strategy</td>
<td>100%</td>
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<tr>
<td>Ensuring regulatory compliance</td>
<td>100%</td>
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**Who Stands to Benefit Most From the Cloud**

Ranking showing which teams respondents say will benefit most from their enterprises' cloud migrations

1. Analytics or AI
2. Data
3. Finance
4. Product
5. IT
6. Customer or client services
7. Company executives
8. Sales
9. Marketing
10. Compliance
11. HR
12. Legal

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**Cloud Migration Yields Many Benefits**

What would you say are the benefits of migrating data, applications and other systems to the cloud?

- **Scale** IT and data infrastructure quickly: 31%
- **Upgrade** IT and data infrastructure more easily: 49%
- **It generates cost savings**: 46%
- **It enables advanced analytics and AI**: 41%
- **It facilitates flexible or remote working**: 46%
- **It’s more secure**: 21%

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*Source: Corinium Intelligence, 2021*
How Cloud-Enabled AI will Drive Business Value in the Future

KEY FINDING

One in four enterprises have made the jump to prescriptive analytics, while 71% are using AI to generate new revenue streams.

There are three major landmarks on the road to AI maturity. The first is using data to describe how things are. The second is using it to predict what will happen next. Then, there’s using data to prescribe the best course of action based on the information at hand.

Our research shows that a growing number of organizations are passing these key milestones on their AI maturity journeys.

In 2018, Gartner reported that 4% of organizations had deployed AI capabilities. Of the 100 data and analytics leaders we surveyed, 69% say their enterprises are at least using predictive analytics or AI models. What’s more, 25% have made the jump to prescriptive analytics.

MercyFirst CDO Dr Besa Bauta explains: “A few years ago, a lot of this was new. But there are many organizations out there that have pretty much codified providing AI as a service.”

“It’s critical for AI-focused executives to think about themselves as centers of innovation, focused on creating products that deliver high business value.”

Ashish Verma
Managing Director and Data Modernization and Analytics Leader, Deloitte
How AI is Driving Business Value Today

With 71% of survey respondents citing it, ‘generating additional revenue’ is one of the most critical applications of AI for businesses today.

‘Improving risk management’, ‘business process automation’ and ‘automating business decisions’ came in as a distant second, third and fourth with 43%, 42% and 38%, respectively.

“For us, it’s not replacing the person but instead augmenting decision-making processes by sourcing information,” says Dr Bauta. “AI algorithms uncover insights that otherwise we wouldn’t have sourced because of the scale and the volume of the information that’s being processed.”

‘Enhancing cyber security’, ‘supply chain optimization’ and ‘improving CX’ were cited by 37%, 32% and 31% of respondents, respectively.

Meanwhile, 30% of respondents say they’re using AI to augment existing decision-making processes.

As BP Global Head of Quantitative and Analytical Solutions Cetin Karakus says, it might not be ideal for enterprises to fully automate business-critical decisions.

“AI definitely is a good tool to use where you could scale the processing of large datasets,” he says. “But you have to integrate it with the existing technologies to make it really valuable and create value.”

He adds: “You still need to have some sort of operational system where certain subject matter experts can have a final say or review of the results.”

Lastly, 16% of enterprises are using AI to enhance fraud detection and just 7% are using it to improve recruitment processes.

Enterprises are Making the Jump to Prescriptive Analytics

Which of the following best describes your enterprise’s current level of AI maturity?

(Select the highest level that applies)

- We have prescriptive analytics or AI capabilities
- We have descriptive analytics or AI capabilities
- We have predictive analytics or AI capabilities
- We have no AI or analytics capabilities

Source: Corinium Intelligence, 2021
Choosing the Right Problems to Solve with AI

Choosing the right business problems to solve with AI has emerged as one of the greatest challenges facing AI-focused business leaders today. Just 4% of our survey respondents say they’ve completely dealt with this challenge. Meanwhile, 82% describe the task as at least ‘quite challenging’ and 32% say it’s ‘very challenging’.

‘Developing AI models in house’ and ‘choosing the right type of model for a given use case’ emerged as other key barriers AI leaders need to overcome. Respectively, 60% and 59% of respondents describe these aspects of AI deployment as being at least ‘quite challenging’.

“These findings demonstrate the difficulty enterprises face with respect to attracting and retaining AI talent,” adds Ashish Verma, Managing Director and Data Modernization and Analytics Leader at Deloitte. “They also highlight how central the ability to innovate has become for AI-focused executives.”

Enterprises that successfully overcome these challenges often do so by building AI teams with deep data science expertise. In fact, 57% of the AI leaders we surveyed have developed efficient processes for implementing, operationalizing and scaling AI capabilities to set their strategies up for success. Meanwhile, 47% have developed efficient processes for developing AI tools in-house.

However, AI and analytics leaders must also pair this technical knowledge with deep domain and industry expertise to uncover the most fertile opportunities for AI innovation and prioritize them accordingly.

“It’s critical for AI-focused executives to think about themselves as the centers of innovation, focused on creating products that deliver high business value,” Verma concludes. “Achieving this goal requires an in-depth knowledge of the industry an enterprise operates in and the broader competitive landscape.”

“It’s critical for AI-focused executives to think about themselves as the centers of innovation”

Ashish Verma
Managing Director and Data Modernization and Analytics Leader, Deloitte
The Business Impact of AI in the Cloud

**KEY FINDING**

One in four analytics leaders have made the jump from predictive to prescriptive analytics or AI capabilities

**Enterprises are Starting to Harness Prescriptive AI Tools**

Which of the following best describes your enterprise’s current level of AI maturity?

- 25% We have **prescriptive** analytics or AI capabilities
- 23% We have **descriptive** analytics or AI capabilities
- 44% We have **predictive** analytics or AI capabilities
- 8% We have no AI or analytics capabilities

**Enterprises are Laying the Foundations for AI**

Which of the following steps has your organization taken to ensure it can benefit from AI and analytics in the cloud?

- Developed efficient implementation, operationalization and scaling processes: 57%
- Developed efficient processes for developing AI or analytics capabilities in-house: 47%
- Invested in change management initiatives to ensure new capabilities are embedded in business processes: 43%
- Hired or reskilled staff to be analytics or AI specialists: 40%
- Invested in data literacy programs for company stakeholders: 37%
- Developed an analytics or AI strategy: 34%
- Allocated budget for analytics or AI initiatives: 31%

**AI Systems Drive Business Value in Many Ways**

How are cloud-based AI systems currently generating returns for your enterprise? (Select all that apply)

- Augmenting business decision-making: 30%
- Automating business decisions: 38%
- Generating additional revenue: 71%
- Improving customer experiences: 31%
- Business process automation: 42%
- Supply chain optimization: 32%
- Improving risk management: 43%
- Enhancing cyber security: 37%
- Enhancing fraud detection: 16%
- Creating fairer recruitment processes: 7%

Source: Corinium Intelligence, 2021
Five AI Technologies Shaping the Future of Business

Our research reveals a clear consensus about the role AI will play in the future of business. A full 82% of the 100 data and analytics leaders we surveyed agree that companies that fail to adopt AI technologies will lose market share to their competitors by 2025.

In sectors including consumer goods, manufacturing, retail and finance, some even predict AI laggards will go out of business within five years.

“AI has gone from hype to reality over the past two years,” says Ashish Verma, Managing Director and Data Modernization and Analytics Leader at Deloitte. “Corporate data scientists have proven the technology’s potential to drive increased productivity, efficiency and ROI.”

He adds: “Over the next 24 months, we should expect to see enterprises that are prioritizing AI investments today secure competitive advantages over their competitors through embedding AI capabilities into their products, supply chains and business processes.”

Past Corinium research has shown that most data and analytics executives are now scaling AI technologies within their enterprises.

But this survey has uncovered five specific technologies that will reshape the business landscape by 2023. These are: 1) natural language processing (NLP), 2) regression learning, 3) AutoML, 4) reinforcement learning and 5) edge computing.

“Corporate data scientists have proven [AI’s] potential to drive increased productivity, efficiency and ROI”

Ashish Verma
Managing Director and Data Modernization and Analytics Leader, Deloitte
Basic AI Systems will be Widespread by 2023

NLP, regression learning and AutoML are relatively simple, ‘entry level’ AI technologies. This may explain why they are so popular. Respectively, 49%, 43% and 42% of our survey respondents say their enterprises will have deployed them by 2023.

AutoML refers ‘off the shelf’ AI systems, such as the ones available through major cloud platforms. Both NLP and regression learning form the basis of AutoML algorithms that can be deployed in this way.

“When you’re looking to do AI, the majority of the processing is with relatively standard techniques,” explains Dr Vladimir Bacvanski, Principal Architect, Strategic Architecture, PayPal.

AutoML refers ‘off the shelf’ AI systems, such as the ones available through major cloud platforms. Both NLP and regression learning form the basis of AutoML algorithms that can be deployed in this way.

“When you’re looking to do AI, the majority of the processing is with relatively standard techniques,” explains Dr Vladimir Bacvanski, Principal Architect, Strategic Architecture, PayPal.

Bacvanski, Principal Architect, Strategic Architecture at PayPal. “This is where the cloud vendors come in. They provide capabilities to run a variety of AI tools.”

Regression learning is a type of ML that involves training models with large datasets until they become accurate enough to be useful in a business context. Common applications for these algorithms include product pricing optimization, credit scoring and audience segmentation.

“Shallow learning [is] really just statistics on steroids”, quips Romy Hussain, former Senior Director of Healthcare Economics at Johns Hopkins Healthcare. “You take a lot of those linear or logistic regressions [and] run them the millions of times to push the error rate to zero.”

Meanwhile, NLP is commonly used to power the latest generation of chatbots for handling customer service queries. But another application for the technology is parsing text-based documents so the data they contain can be ingested and used to inform business decisions.

“A lot of our data is stored in narrative notes in our Electronic Health Records, as case notes or assessments,” explains MercyFirst CDO Besa Bauta. “A lot of that data doesn’t get used for clinical decision-making.”

She adds: “Through NLP, what we’re doing is pulling in the narrative data and structuring it in a way that brings insight to the clinician.”
Reinforcement Learning is Enabling Prescriptive AI

Reinforcement learning is a branch of ML that uses simulated ‘rewards’ to teach AI systems to achieve desired outcomes in uncertain circumstances through trial and error.

Our research shows that 40% of data and analytics leaders expect to have reinforcement learning models in their organizations by 2023. Just 38% of respondents say the same about deep learning.

“I’m really excited by reinforcement learning,” says Hussain. “The possibilities there are really endless – not just to predict something like an outcome but also to recommend what we should do about it.”

“There are a ton of applications, certainly in the healthcare field, but also in the wider world,” she adds. “For example, a lot of ride sharing app reinforcement is used to pick out optimal routes from A to B.”

Hospitals including Johns Hopkins are using reinforcement learning to build prescriptive capabilities into patient readmissions models to provide care recommendations for different patient segments.

In other sectors, reinforcement learning is being used as the basis for recommendation engines, stock trading models, predictive machinery maintenance technologies and autonomous manufacturing robots.

“The main benefit [of edge computing] is speed. You are able to learn about things much, much faster”

Dr Vladimir Bacvanski
Principal Architect, Strategic Architecture, PayPal
AI Will Transform the Business Landscape by 2025

What do you think will happen to organizations in your sector that haven’t embraced AI by 2025?

- They will be put out of business
- They will lose a great deal of their market share to competitors
- They will lose some market share to their competitors
- They will see no negative impact

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Source: Corinium Intelligence, 2021

**Edge Computing and the Next Wave of AI Innovation**

Edge computing is an exciting innovation at the intersection of cloud computing and AI. It involves installing AI chips directly onto Internet of Things (IoT) devices, so they can perform complex computations without having to send data to the cloud.

The edge computing market is forecast to grow from $3.6 billion USD in 2020 to $15.7 billion USD in 2025, and our research confirms substantial interest in the technology from the business community. One in four of our survey respondents expect it to be deployed in their organizations by 2023.

To illustrate edge computing’s potential to improve business processes, BP Global Head of Quantitative and Analytical Solutions Cetin Karakus gives the example of how the petroleum giant may use drones with built-in AI chips to monitor LNG tanks for signs of cracking.

“They might be seeded with some sort of calibrated ML model, so they can just make a decision at that point, rather than send the data to the back-end servers and get the results back,” he explains.

“It could be a very expensive and laborious process to have a team of experts going through the whole place and trying to look at the cracks,” he adds. “With computer vision, it might actually be more reliable."

In this way, edge computing may enable a new wave of AI-led innovation. Embedding AI directly into consumer devices and enterprise machines will open doors to new applications for the technology.

Of course, it is up to individual data and analytics leaders to determine which types of AI have the greatest potential to drive value in their organizations.

However, given the acceleration we’ve seen in the AI space in recent years, it seems safe to say that those who aren’t making those strategic investments today risk falling behind their competitors over the next 24 months.
How AI is Shaping the Future of Business

KEY FINDING
Cloud-focused leaders that succeed in operationalizing AI across their organizations believe they will steal market share from their competitors over the next five years.

Finding the Right Problems to Tackle with AI is a Challenge
Please rate the following potential challenges as they apply to your business:

- Completely dealt with
- Largely dealt with
- Quite challenging
- Very challenging

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<thead>
<tr>
<th>Challenge</th>
<th>0%</th>
<th>20%</th>
<th>40%</th>
<th>60%</th>
<th>80%</th>
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<tbody>
<tr>
<td>Securing executive buy-in for AI initiatives</td>
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<td>Choosing the right type of AI for a given use case</td>
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<td>Recruiting AI talent (or upskilling staff)</td>
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<td>Ensuring data quality is high enough</td>
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<td>Integrating new AI tools with existing systems</td>
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<td>Selecting the right AI vendors to buy from</td>
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<td>Developing AI models in-house</td>
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<td>Measuring the impact of AI systems</td>
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<td>Creating an AI platform to manage AI deployment</td>
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<td>Ensuring regulatory compliance</td>
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<td>Ensuring good AI governance</td>
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<td>Considering and adapting to ethical concerns</td>
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<td>Securing sufficient budget for AI initiatives</td>
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<td>Identifying the right business problems to solve with AI</td>
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New AI Systems will Shape the Future of Business
Which of the following AI technologies do you expect to be deployed within your organization by 2023?

- Augmented Intelligence: 26%
- AutoML: 42%
- Computer Vision: 36%
- Deep Learning: 38%
- Edge Computing: 41%
- Multi-Agent Systems: 11%
- Natural Language Processing: 49%
- Reinforcement Learning: 43%
- Regression Learning: 40%
- Robotic Process Automation: 25%

Source: Corinium Intelligence, 2021
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For more information about Deloitte AI Services and the Deloitte AI Institute, visit: www.deloitte.com/us/ai

About the Editor

Solomon Radley is an experienced editor and reporter with a deep understanding of the data, analytics and CX space and close relationships with many of the sectors’ most prominent C-level executives.

He works with data and analytics, learning and development and customer experience leaders to champion new innovations and highlight how the world’s most forward-thinking brands are using data to fuel their digital transformations.

To share your data story or enquire about appearing in a Corinium report, blog post or digital event, contact him directly at solomon.radley@coriniumgroup.com
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