ORACLE

2020:

Oracle's Top 10 Cloud Predictions

The impact automation, AI, machine learning, blockchain, and more will have on IT by 2025

Contents

Introduction

Prediction
Number 1

90 percent of all manual IT operations and data-management tasks will be completely automated, opening the door to a new era of IT innovation.

Learn more

Prediction
Number 2

There will be 600 times more sensitive data shared in the cloud.

Learn more

Prediction
Number 3

100 percent of enterprise applications will include some form of AI.

Learn more

Prediction
Number 4

100 percent of supply-chain apps will depend on augmented reality, virtual reality, blockchain, ML, and IoT.

Learn more

Prediction
Number 5

Automated business processes will enable more personalized interactions in HR, sales, and other business domains.

Learn more

Prediction
Number 6

80 percent of major cities will use IoT for Smart City initiatives.

Learn more

Prediction
Number 7

Data science will be increasingly automated and embedded into analytics and data-management systems.

Learn more

Prediction
Number 8

The rise of AI-based machines will create new jobs that haven't been invented yet.

Learn more

Prediction
Number 9

Cybersecurity attacks will become more sophisticated with the use of IoT and AI.

Learn more

Prediction
Number 10

80 percent of data will be linked to things instead of individuals.

Learn more

Conclusion

Preparing for the next generation of the cloud

Why is cloud computing such a game changer? In a word, immediacy. Cloud models enable real-time views into your data, opening the door to instantaneous insights. It's no wonder that 74 percent of businesses say the cloud has given them a competitive edge.[1]

However, not all clouds are created equal. First-generation infrastructure-as-a-service (IaaS) and platform-as-a-service (PaaS) clouds were built using decades-old technology. Newer, second-generation clouds have been designed to support the technologies that drive the modern enterprise (such as AI, blockchain, Internet of Things (IoT), and real-time analytics) as well as to meet today's relentless demands for scale,

efficiency, and security. Forward-looking customers are drawn to these next-generation clouds for three primary reasons:

To accelerate agility: 70 percent of IT decision-makers believe cloud computing makes them more agile.[2]

To scale more easily: Companies that adopt cloud services experience a 20.6 percent average improvement in time to market.[3]

To get online fast: 49 percent of enterprises see faster time to deployment as a key reason for migrating to a modern cloud.[4]

By 2025, Oracle expects to see more and more enterprises embrace a next-generation cloud model to achieve unprecedented degrees of automation. In this installment of our "Top 10 Cloud Predictions," we explore what these clouds will look like, explain how they will shape tomorrow's IT environments, and delve into the technologies and business models that are changing the face of enterprise computing.

---

[1] RedNight, "Cloud Computing: The Best Benefits of Comprehensive Professional Services," January 9, 2018, rednightconsulting.com/cloud-computing-migration-benefits/.
[2] Oracle webpage, roadtothe.cloud/uae.
[3] Vanson Bourne, State of IT Report, 2018
[4] Forrester, "Global Business Technographics Infrastructure Survey," 2018

Prediction #1

90 percent of all manual
IT operations and data
management tasks will
be completely automated,
opening the door to a new
era of IT innovation.

Prediction #1

While some technology professionals are still consumed with routine operations such as backing up, scaling, tuning, monitoring, and securing critical information systems, autonomous databases are quickly making these activities a thing of the past. By 2025, 90 percent of all manual IT operations and data-management tasks will be completely automated.

As IT professionals shed a progressively larger portion of these administrative tasks, they will have more time to develop analytic applications and bring new revenue-producing products and services to market. Cloud computing enables organizations to innovate faster than ever before. Liberated IT workers have more time to explore the latest advancements in AI and machine learning (ML)—from conversational user interfaces to blockchain to the IoT.

For example, self-learning systems automate the collection of data across multiple applications, and can automatically visualize millions of data points. By displaying enterprise data through graphs, charts, and animations, business users can more easily perceive trends, patterns, and correlations in their data, rather than trying to glean insights from columnar reports and spreadsheets. The cloud moves these advanced technologies into the mainstream.

> " By 2025, 90 percent of all manual IT operations and data-management tasks will be completely automated.

Prediction #2

There will be 600 times more sensitive data shared in the cloud.

Prediction #2

> ❝
>
> The attackers are becoming more sophisticated, so it's critical for companies to ensure the resilience of their data and systems.

Seven out of ten organizations now keep business-critical data in the cloud. Most of these organizations depend on hybrid clouds that allow them to keep some critical business systems on premise and shift most of their data into the cloud. While this approach maximizes flexibility and reduces cost, it also exposes organizations to increased risk, because hybrid environments can lead to inconsistent security policies and controls.
By 2025, there will be 600 times more sensitive data shared in the cloud and a corresponding increase in security threats, both from automated external attacks and the misuse of authorized identity credentials.

The attackers are becoming more sophisticated, so it's critical for companies to ensure the resilience of their data and systems. However, due to a significant shortage of cybersecurity expertise, it will be ever harder for companies to hire enough people to staff their security operations. Unpatched systems create an easy path for attackers who are intent on targeting known vulnerabilities. To prevent new cyberattacks, organizations need autonomous systems that infuse advanced security capabilities into every layer of the IT infrastructure—from the applications, to the data, down into the silicon.

Prediction #3

100 percent of enterprise applications will include some form of AI.
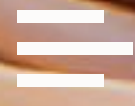
Prediction #3

AI technology is fundamentally altering enterprise computing by changing how organizations receive, manage, and secure business data. Enterprises are quickly embracing AI as they perceive its ability to improve efficiency, boost productivity, and reduce costs. By 2025, 100 percent of enterprise applications will include some form of embedded AI. These technology advancements will impact all parts of the business, accelerating time to insight by helping managers and executives obtain a better understanding of operations, employees, markets, and customers.

ML capabilities allow information systems to get ever smarter as they interact with more people and systems. Conversational AI is creating a new standard of engagement between automated robots and

humans, both externally with customers and internally in the workplace. For example, in finance, machines will field queries about invoices, POs, expenses, and budgets, enabling a new level of self-service. Real-time financial reporting will make traditional reporting cycles less relevant, eliminating the need for monthly or quarterly analysis. These real-time data processing models will impact not just finance, but many other business domains as well. As information becomes instantly available, organizations will be able to focus on discovering actionable insights that drive the business forward, instead of merely processing data.

> " By 2025, 100 percent of enterprise applications will include some form of embedded AI.

Prediction #4

100 percent of supply-chain apps will depend on augmented reality, virtual reality, blockchain, ML, and IoT.

Prediction #4

> " In some cases, AI algorithms eliminate the need for human decision-making altogether.

Intelligent automated systems are quickly taking hold in many industries, causing paradigm shifts in system design, logistics, manufacturing, infrastructure, and more. Increased buyer expectations, shorter product lifecycles, new regulations, and fluctuating demands are testing the limits of traditional supply chains and driving the adoption of emerging technologies. For example, in manufacturing, self-learning techniques and natural-language processing (NLP) technologies help automate demand forecasting, predictive maintenance, and fulfillment. In some cases, AI algorithms eliminate the need for human decision-making altogether. Virtual reality (VR) and augmented reality (AR) interfaces enable more-immersive experiences for employees, such as 3D renderings that help shop-floor workers visualize equipment configurations. Voice-controlled assistants can look up product information and report production milestones, conveying insights about current conditions gleaned from IoT sensors.

Blockchain solves major challenges in these supply chains by curtailing counterfeiting and improving visibility/traceability. Materials and products that travel globally must pass through multiple suppliers, manufacturers, distributors, carriers, and service providers. Blockchain deregulates global supply chains that formerly relied on centralized governance models, creating decentralized, distributed, and digital records of transactions that are anonymous, tamper-proof, and unchangeable.

Prediction #5

Automated business processes will enable more personalized interactions in HR, sales, and other business domains.

Prediction #5

AI and autonomous technologies are permeating the workplace, streamlining routine business processes and freeing up professionals to focus on more-meaningful and productive human interactions. For example, automated workflows can streamline recruiting operations by tracking applicants and fielding requests from new hires. Some HR teams use AI to identify top candidates by comparing their stated qualifications against job postings. Chatbots can communicate with candidates to answer questions and schedule interviews. These automated functions alleviate routine administrative tasks so HR professionals can focus on hiring qualified candidates that match the corporate culture. By 2025, 70 percent of recruiting will be taken over by AI and bots.

In sales, AI systems can analyze large datasets to identify the leads that are most likely to lead to sales. AI systems compile vast amounts of client data, from social-media postings to customer interaction histories to sales and service events. AI's self-learning capabilities enable software processes to interact with lots of people simultaneously while conveying consistent brand messages. Software bots can qualify leads, rank opportunities, and deliver targeted recommendations to prospective clients. They can adjust pricing and recommend products based on market-basket analysis and browsing history. While the heart of sales will always be human interaction, the value of these intelligent technologies will continue to grow. By 2025, 80 percent of sales will be automated, enabling sales reps to focus on relationship-building and customer engagement.
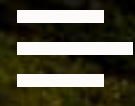
> " By 2025, 80 percent of sales will be automated enabling sales reps to focus on relationship-building and customer engagement.

Prediction #6

80 percent of major cities will use IoT for Smart City initiatives.

Prediction #6

> "
>
> **By 2025, 80 percent of major cities will use IoT data for Smart City initiatives.**

The growth of IoT technologies is enabling communities to become more human-centric and resilient. By 2025, 80 percent of major cities will use IoT data for Smart City initiatives. At the core of these endeavors, ML technology will be used to gather and analyze city data and increase citizen engagement. Automating routine interactions will free up human agents to offer personalized services. These technologies will improve accountability by requiring city leaders to become more transparent in their dealings—decentralizing data, technologies, and decision-making.

Over the long term, IoT technology will improve collaboration and trust amongst citizens to create more-unified cities. As these technologies become more affordable and ubiquitous, many communities will deploy intelligent resources such as fixed video surveillance and officer wearables, further improving safety and transparency. Other popular Smart City initiatives include resilient energy and intelligent transportation. The applications are virtually endless, and each use case serves to improve the quality of life for these communities.

Prediction #7

Data science will be increasingly automated and embedded into analytics and data-management systems.
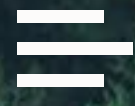
Prediction #7

Data scientists help convert massive amounts of data into actionable insights, leveraging unique skills in advanced math and statistics, as well as ML and AI. As organizations continue to discover the value of data-driven insights, the demand for data scientists will grow. The industry is already seeing a deficit in these skilled workers and, by 2025, based on current trajectories, there will not be enough data scientists to meet rising demand.

Fortunately, as AI and ML technologies become more sophisticated, they will automate a progressively larger portion of today's data science tasks, making each skilled worker more efficient. For example, today's data scientists typically spend 80 percent of their time collecting and preparing data, and only about 20 percent of their time looking for patterns in that data and discovering new insights.[5] As augmented analytic systems get powerful enough to train and execute algorithms at scale, the vast majority of today's data-collection and preparation tasks will be automated. AI systems will also get better at generating insights and interpreting results for business users, freeing up data scientists to determine which findings are most relevant out of all the potential outcomes.

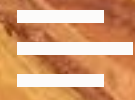> " By 2025, based on current trajectories, there will not be enough data scientists to meet rising demand

[5] Gil Press, Forbes, "Cleaning Big Data: Most Time-Consuming, Least Enjoyable Data Science Task, Survey Says" (March 23, 2016)

Prediction #8

The rise of AI-based machines will create new jobs that haven't been invented yet.

Prediction #8

> " Machines are acting as employees in some companies, requiring business leaders to consider how these mechanical workers can best collaborate with one another.

AI is becoming a critical part of the corporate workforce as more and more machines use the technology to interact with humans. Machines are acting as employees in some companies, requiring business leaders to consider how these mechanical workers can best collaborate with one another. For example, in manufacturing, AI-driven robots can autonomously locate and store products in a warehouse. Using vision sensors, driverless vehicles can assess their environments and react to changing conditions. Onboard systems use mathematical models to avoid obstacles, establish optimal routes, and increase the efficiency of packing and picking processes. On roads and highways, autonomous vehicles use AI-based systems to connect and communicate with each other, as well as with the infrastructure around them.

While the rise of automation will displace some manual and repetitive tasks, the prevalence of AI is simultaneously creating many new and compelling opportunities. By 2025, it will create thousands of new roles, including many jobs that haven't been invented yet. In that time, machines will perform double the amount of work as humans. While the rise of automation may stir fear for the immediate workforce, over the long term it will enable a more prosperous economy, higher-value work, and a better quality of life across the globe.

Prediction #9

Cybersecurity attacks will become more sophisticated with the use of IoT and AI.

Prediction #9

As useful as ML technologies are to business operations, in the wrong hands they can turn these technologies against us. Cybercriminals can use automated AI and IoT systems to breach enterprise networks and steal sensitive data. As smart devices store progressively more personal information, they become new targets for these attackers. Malicious IoT programs can infect connected devices and aid criminals in stealing identities or committing a distributed denial of service (DDoS) attack. According to Forrester, the rapid adoption of IoT is creating a larger attack surface that's often built with only a few security controls, exposing enterprises in never-before-seen ways.[6] Similarly, as businesses and individuals increase their reliance on cloud-based storage, attackers will have a wider surface area to target.

By 2025, 80 percent of security attacks will come from an inside source. Security misconfigurations can occur at any layer of the technology stack, from network services to the database, and attackers will often exploit these vulnerabilities to breach information systems. In many cases, security patches are not installed quickly enough, creating an easy path for attackers who target these known vulnerabilities. Lack of automation also introduces a high risk of human error. Automated cybersecurity processes can detect misconfigurations and provide continuous protection. The most reliable way to combat these growing threats is by using autonomous technologies that can automatically apply patches and validate system integrity 24/7.

> " By 2025, 80 percent of security attacks will come from an inside source.

6 PREDICTIONS 2020: On the Precipice of Far-Reaching Change (Forrester, December 2019).

Prediction #10

80 percent of data will
be linked to things
instead of individuals.

Prediction #10

In the years ahead, the majority of security threats will involve Internet-connected things. For example, Forrester predicts that cyberattackers will block connections to products such as home lighting systems, or meddle with the operation of critical shop-floor machinery—and "hold these devices hostage" until the manufacturer pays a large ransom.[7]

By 2025, 80 percent of identity will be the identity of things rather than of individuals. The scale of identity data is larger than ever before, with much of that data scattered across users, applications, and ecosystems. Context-based identity correlates relevant data with these identities such as behavior data, location data, usage patterns, systems information, and more. By linking additional data with an identity, cybersecurity professionals—bolstered by ML and AI—can predict behaviors and patterns that reveal potential security threats. Using ML and predictive analytics, organizations will increase visibility into their systems to autonomously identify suspicious activity on an unprecedented scale.

> " The scale of identity data is larger than ever before, with much of that data scattered across users, applications, and ecosystems.

[7] PREDICTIONS 2020: On the Precipice of Far-Reaching Change (Forrester, December 2019).
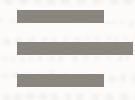
Conclusion

Today, it is imperative for companies of all sizes and geographies to adopt a next-generation cloud—a cloud that is designed for the modern enterprise, and that yields unprecedented scale, efficiency, and security.

How do you get there?

Oracle is leading the way with a second-generation cloud that fundamentally rearchitects conventional IaaS and PaaS cloud offerings. Built from the ground up to meet the needs of mission-critical applications, Oracle Cloud features the world's first self-repairing, self-tuning, self-driving Oracle Autonomous Database, in conjunction with the advanced analytics capabilities of Oracle Analytics Cloud. These mature cloud services eliminate complexity, human error, and manual management, all while cutting administration costs by up to 80 percent.

Oracle's second-generation offering is built on the world's most robust cloud infrastructure, powered by integrated platform services and a comprehensive software portfolio—from application development and business analytics to data management, integration, security, AI, and blockchain—so you can instantly utilize the technologies that drive market leaders to succeed. It also includes robust planning, validation, and migration tools to orchestrate the movement of your on-premise information systems to the cloud. You'll gain the ability to more easily mitigate security threats and automate data-management tasks, all with industry-leading scalability, availability, and performance.

Learn more and get started

Oracle Cloud Infrastructure

Oracle Autonomous Database

Do more with data

Tips for IT and Business leaders