⊜IDC

Enterprise Business Transformation
THE CRITICAL ROLE OF ARTIFICIAL INTELLIGENCE

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Navigating This InfoBrief eBook

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Executive Summary

Artificial intelligence (AI) remains a foundational investment in most digital transformation projects and programs, so having a scalable enterprise AI strategy and competency is crucial. IDC predicts that direct digital transformation (DX) investments will **accelerate to a compound annual growth rate (CAGR) of 16.5% for 2022 to 2024,** up from a CAGR of 15.4% for 2019 to 2024, making up 55% of all ICT investment by the end of 2024.

AI shows no sign of slowing down. In fact, the year 2020 accelerated digital transformation and moved AI out of the corners into the mainstream. The early adopter advantage is petering out, and **AI is rapidly integrated into the fabric of business,** embedded into more business-critical functions such as marketing, legal, human resources, and procurement across industries.

Worldwide artificial intelligence spend in 2021 was $88.6 billion and will exceed $221 billion by 2025.

AI as a Driver of Digital Value

What's Keeping Technology Leaders Up at Night?

TODAY

IN TWO YEARS

Of the following political, social, and economic **risks,** which do you expect will have the greatest impact on your business in **2022?**

Of the following political, social, and economic **risks,** which do you expect will have the greatest impact on your business in **two years?**

#1:
Talent skills gap
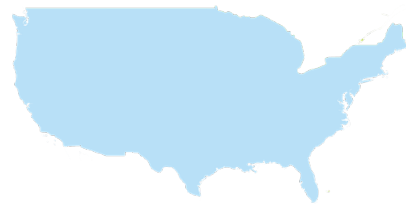
#1:
Cybersecurity threats

#1:
Gaps in digital transformation execution

United States
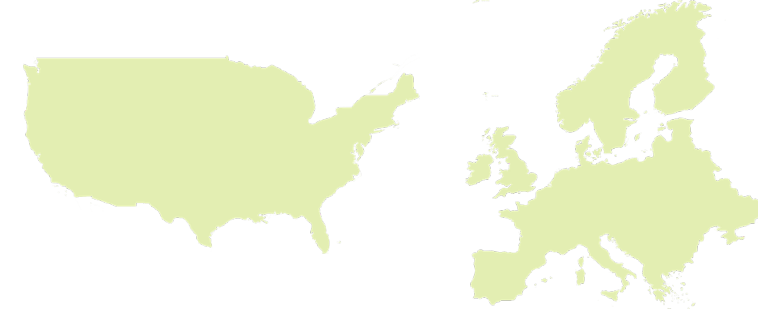
Europe

United States and Europe

n = 774, Base: U.S. and Europe data only, Source: IDC's *CEO Survey Interim Data,* January 2022

Digital is the main reason just over half of the **companies on the Fortune 500 have disappeared** since the year 2000.

PIERRE NANTERME, CEO OF ACCENTURE

AI Is at the Heart of Digital Disruption

Technology leaders will have to focus on delivering ongoing digital value as businesses have ushered in the era of compressed digital transformation.

Disruption is unsettling, but it can also serve as a catalyst for innovation and transformation.

We have now entered the domain of AI-augmented work. Responsible creation and use of AI solutions that can sense, predict, respond, and adapt at speed is an important business imperative.

AI, machine learning, and natural language processing (NLP) are beginning to play a much larger role in enterprise businesses, whether in customer service, customer relationship management, or even learning initiatives.

2020 was the year that strengthened the value of enterprise AI.

AI is no longer a "nice to have." AI laggards will cease to exist.

AI disrupters will thrive in the digital era. They have an enterprisewide AI strategy and have started rolling out coordinated initiatives. They are evaluating and prioritizing efforts to understand where AI can add value, along with data strategy to maximize ROI. Data is foundational to AI and ensuring data readiness across the AI and machine learning (ML) life cycle is critical to achieving superior business outcomes.

Spending on AI Will Exceed $221 Billion by 2025

Worldwide Artificial Intelligence Systems Spend

5-year CAGR
26.0%

- 2020: $69B
- 2021: $89B
- 2022: $113B
- 2023: $144B
- 2024: $177B
- 2025: $222B
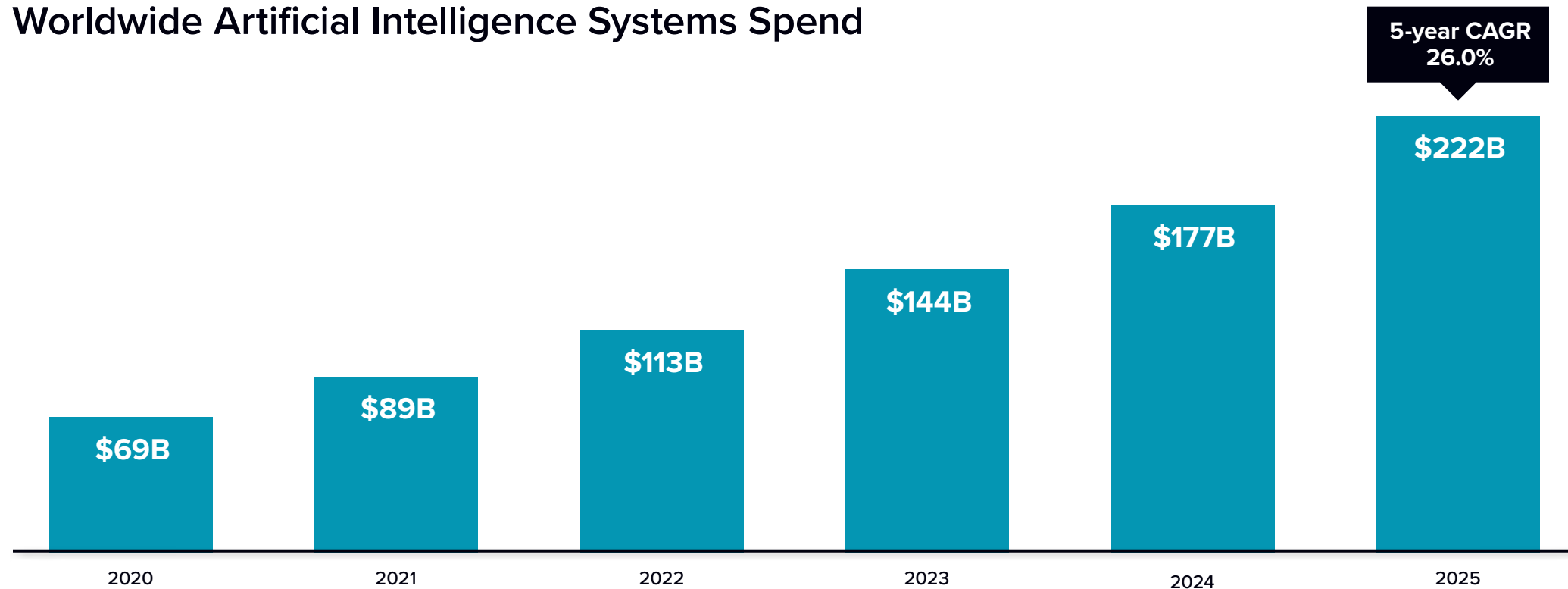
n = 774, Source: IDC's *Worldwide Artificial Intelligence Spending Guide,* February 2022 V1

Business Objectives Behind AI/ML Spending

What are the primary business objectives for using AI for your projects/initiatives?

Business Objective	Small Firms	Large Firms
Improve operational efficiency	39%	45%
Increase innovation	42%	45%
Improve customer experience / customer satisfaction	37%	45%
Improve employee productivity	33%	42%
Revenue growth	32%	41%
Profit growth	36%	38%
Increase revenue from new markets, products, and/or customers	29%	37%
Increase business resilience	32%	36%
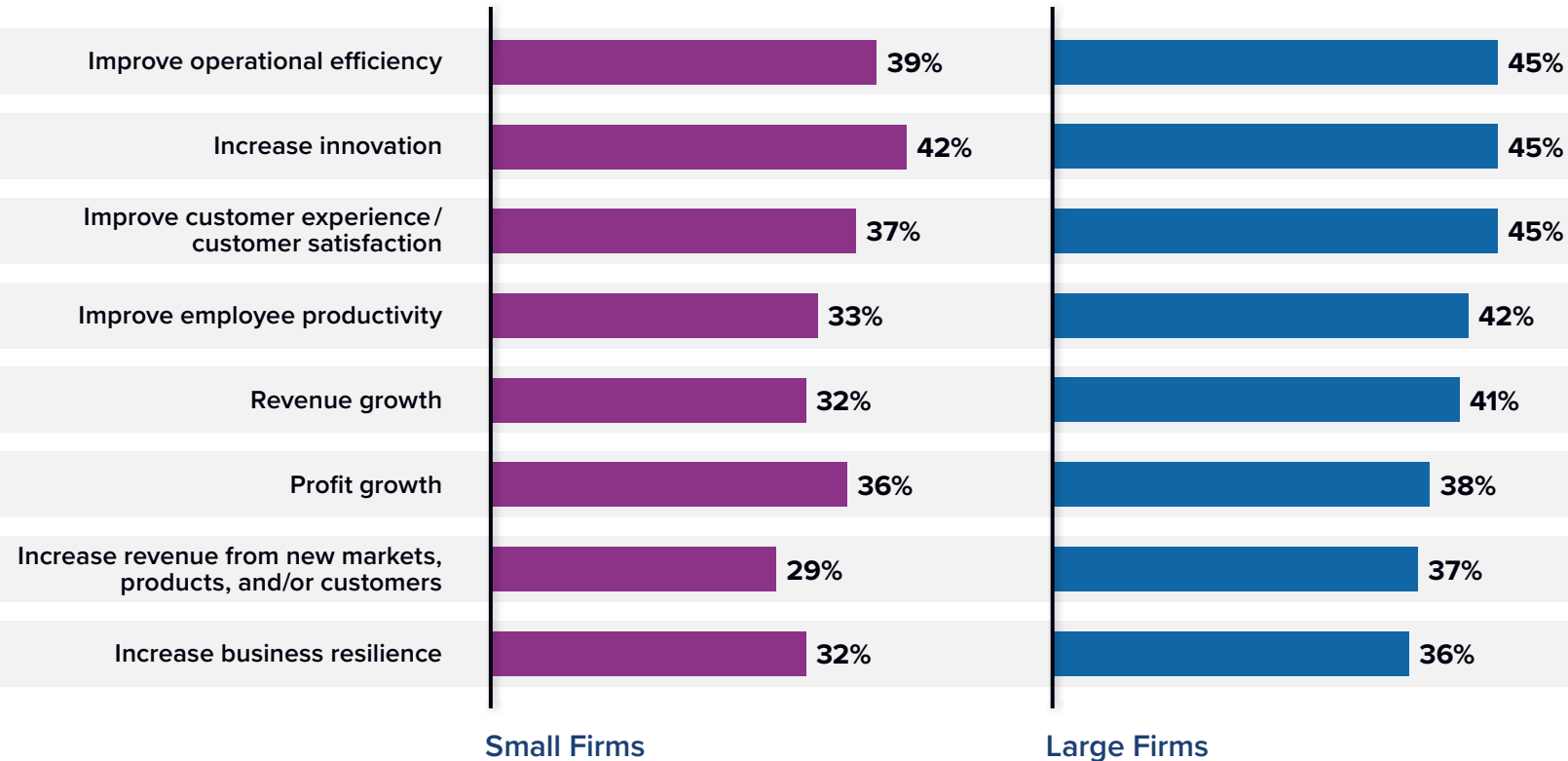
Improving operational efficiency, increasing innovation, and **improving customer experience and satisfaction** are the **top 3 business objectives** behind AI/ML spend across geographies and organizations.

While smaller firms prioritize **innovation** a bit higher than **operational efficiency and customer satisfaction,** they are aligned with larger firms on the top 3 business objectives.

n = 2,000, Source: IDC's *AI StrategiesView 2021*, April 2021

Types of AI Applications in Use

What kinds of AI applications are you investigating or deploying currently for the following business process areas?

Business process area	Chatbots	Recommendation engines	Optimization engines	Intelligent task or process automation
IT operations	27%	33%	37%	37%
Fraud / risk management	26%	32%	34%	37%
Finance / accounting	29%	35%	34%	37%
Supply chain	27%	33%	35%	38%
Management / maintenance of physical assets	26%	31%	32%	35%
R&D / engineering	29%	34%	37%	39%
Commerce	31%	32%	35%	36%
Service delivery	29%	32%	34%	35%
Security	26%	30%	36%	33%
Manufacturing operations	25%	30%	34%	35%
Customer service and support	37%	32%	37%	37%
Marketing	30%	31%	31%	32%
Human resources	33%	31%	31%	34%
Sales	29%	29%	32%	36%
Procurement	26%	31%	28%	38%

AI-powered automation is expected to take center stage as part of the **next wave of enterprise automation,** as **optimizations move beyond reactive to predictive and proactive.**

Note: % corresponds to number of respondents; multiple dichotomous table; totals will not sum to 100%. n = 1,920, Source: IDC's *Industry AI Path 2021*, August 2021

Types of AI Applications in Use *(continued)*

What kinds of AI applications are you investigating or deploying currently for the following business process areas?

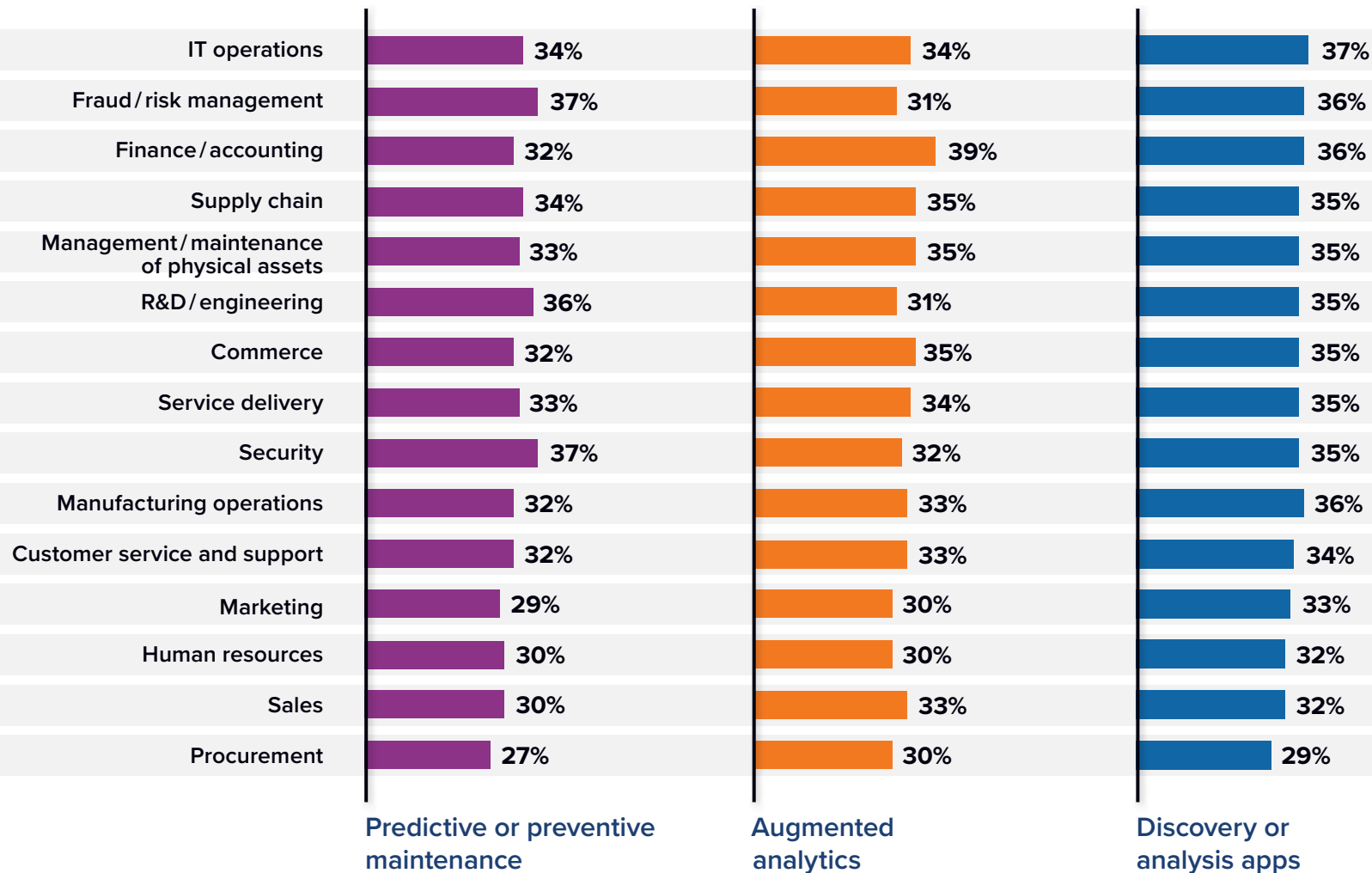| Business process area	Predictive or preventive maintenance	Augmented analytics	Discovery or analysis apps
IT operations	34%	34%	37%
Fraud / risk management	37%	31%	36%
Finance / accounting	32%	39%	36%
Supply chain	34%	35%	35%
Management / maintenance of physical assets	33%	35%	35%
R&D / engineering	36%	31%	35%
Commerce	32%	35%	35%
Service delivery	33%	34%	35%
Security	37%	32%	35%
Manufacturing operations	32%	33%	36%
Customer service and support	32%	33%	34%
Marketing	29%	30%	33%
Human resources	30%	30%	32%
Sales	30%	33%	32%
Procurement	27%	30%	29%

Better understanding and classification of unstructured data and processes can lessen the burden of manually analyzing and orchestrating actions.

Without AI, data discovery associated with automation is mostly **limited to structured processes and structured data.**

Recent breakthroughs in NLP using transfer learning and reinforcement learning techniques are **accelerating the rate of adoption of recommendation and optimization engines.**

Note: % corresponds to number of respondents; multiple dichotomous table; totals will not sum to 100%. n = 1,920, Source: IDC's *Industry AI Path 2021*, August 2021

AI Use Cases for Financial Institutions

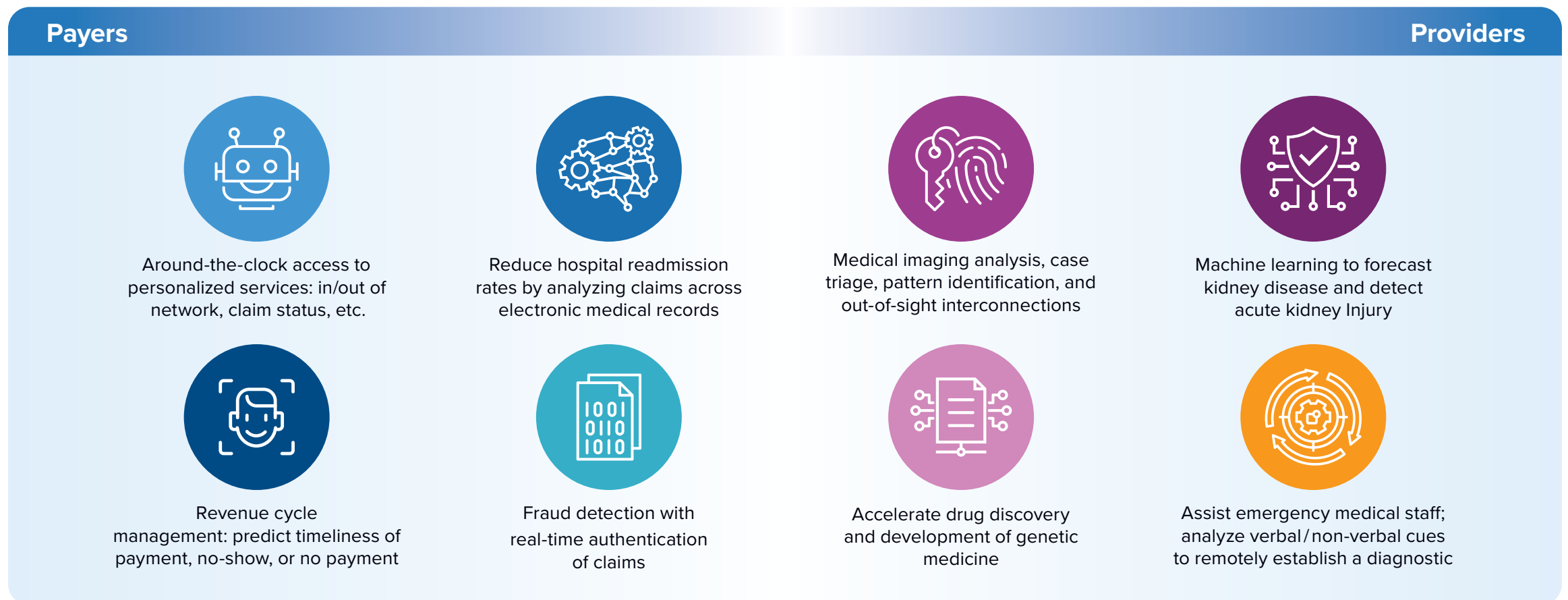AI has become an integral part of technology roadmaps for **financial institutions.** Although experience of AI use in production varies widely across organizations, there's general acceptance of its power to disrupt, and an understanding of the kinds of business problems it can address.

Front office

Back office

Smile-to-pay facial scanning to initiate transaction

Machine learning for program advisors and recommendation systems

Automated threat intelligence and prevention systems

Machine learning for fraud analysis and investigation

Conversational bots for basic servicing requests

Automated claims processing

Machine vision and natural language processing for document processing

Smart business innovation and automation

AI Use Cases for Healthcare

Healthcare payers and providers are investing in innovation and AI-powered digital transformation (DX) to improve and personalize member experiences while creating greater value and driving operational efficiencies.

Payers

Providers

Around-the-clock access to personalized services: in/out of network, claim status, etc.

Reduce hospital readmission rates by analyzing claims across electronic medical records

Medical imaging analysis, case triage, pattern identification, and out-of-sight interconnections

Machine learning to forecast kidney disease and detect acute kidney Injury

Revenue cycle management: predict timeliness of payment, no-show, or no payment

Fraud detection with real-time authentication of claims

Accelerate drug discovery and development of genetic medicine

Assist emergency medical staff; analyze verbal/non-verbal cues to remotely establish a diagnostic

AI Use Cases for Manufacturing

Manufacturers are investing in AI-powered solutions to cut downtime, ensure high-quality products, and improve operational efficiency. AI can have a crucial maintenance impact on production environments.

Operational efficiency
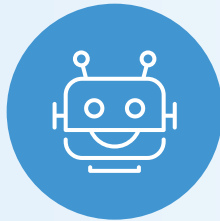
Quality checks and predictive maintenance

Predict equipment failure and prevent accidental shutdowns

Accurately predict product demand: automate supply, demand, and inventories functions

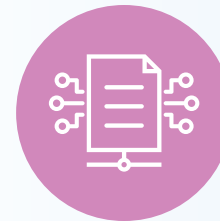Optimize warehouse management and logistics operations

Customer experience

Digital twin / advanced digital simulations to design and test equipment virtually

Customer management with personalized experiences: quicker response times, more-informed decisions

AI-powered robots for repetitive tasks, safer workplace, and improved productivity

Forecast product prices; competitive pricing yields more profits

Leading Use Cases Across Other Industry Verticals

Retail

- Automated customer service agents
- Expert shopping advisors and product recommendations
- Price optimization
- Cashierless checkout
- Supply and logistics, fleet management

Federal government

- Intelligent case management of application and delivery of benefits
- Intelligence systems: defense, terrorism, investigations
- Urban, transportation, or environmental monitoring and planning

Insurance

- Program advisors and recommendation systems
- Smart business innovation and automation
- Automated claims processing
- Financial crime management

Life sciences

- Clinical trial management and recruitment
- Pricing and revenue management
- Drug discovery
- Automated human resources

Education

- Adaptive learning
- Student engagement tracking and analysis
- Financial aid management and compliance

Telecommunications

- Automated threat intelligence and prevention systems
- Smart networking
- Automated customer service agents

# Early Adopters Saw the Biggest Gains in Customer Satisfaction

👋 IDC POINT OF VIEW

Customer experience (CX) is rapidly evolving and is expected to overtake price and product as the key brand differentiator. Today, customers expect immediate responses from your business. AI has the potential to transform CX from empowering self-service to improving personalization. AI-powered CX is emerging as one of the dominant trends in customer service. AI-powered CX leverages technology like machine learning (ML), deep learning, and natural language understanding to automate all the little interactions that make up a user's experience. The key difference between "AI customer experience" and "AI customer service" is that the former is not limited to rapid resolutions to customer questions and issues.

During the global pandemic, one example of how AI augmented customer experience was via an AI-powered virtual agent / chatbot. As per IDC research, their biggest benefits were self-service and eliminating wait times. Automating mundane tasks allows human customer service reps to work more efficiently and focus on complex issues.

The results are happier customers who turn into long-term loyalists and reduced customer service costs. AI helps customers discover the most relevant products and streamline their online experience. Companies are also using AI for proactive customer service, which allows them to anticipate and solve problems and issues before customers are even aware.

Worldwide early adopters of AI-powered solutions reported

39%
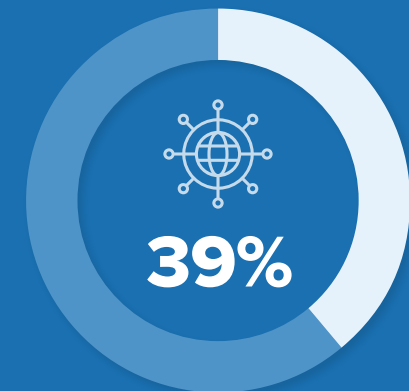
improvement in customer experience / customer satisfaction over the past 12 months.

Source: IDC's *AI StrategiesView 2021*, April 2021

# AI-Powered Solutions Boost Employee Productivity

IDC POINT OF VIEW

IDC surveys have repeatedly shown that improving employee productivity and empowering people to be proficient in their jobs is a key priority for businesses embracing AI/ML. For example, AI in contact centers can transform human agents into specialists. It can offer real-time guidance by delivering information, workflows, and turn-by-turn instruction while ensuring a consistent experience for customers. It can surface relevant and useful documents to help call center agents. AI can suggest chat responses for an agent using conversation context and provide guidance on the conversation flow from the identified customer intent. It can identify in real time why users are contacting them and automate call disposition classification. A pop-up dialog box of the right information at the right time lessens the learning curve for new agents. Overall, AI leads to higher job satisfaction for the human agents.

Likewise, AI-powered systems can help marketers test more ad platforms and optimize targeting. AI-powered recommendations support sales professionals with the next best action based on sales stage, win probability, and best practices learned from across other opportunities. It helps IT operations handle proactive troubleshooting, upgrades, modernization, and improvements in service performance. AI helps finance assign general ledger accounts, cost objects and profitability analysis (CO-PA) dimension values to incoming invoices without a purchase order reference. This enhances financial reports, minimizing roadblocks due to discrepancies in accounts and budgets, reducing invoice processing time and increasing the quality and compliance of general ledger accounts and cost objects.
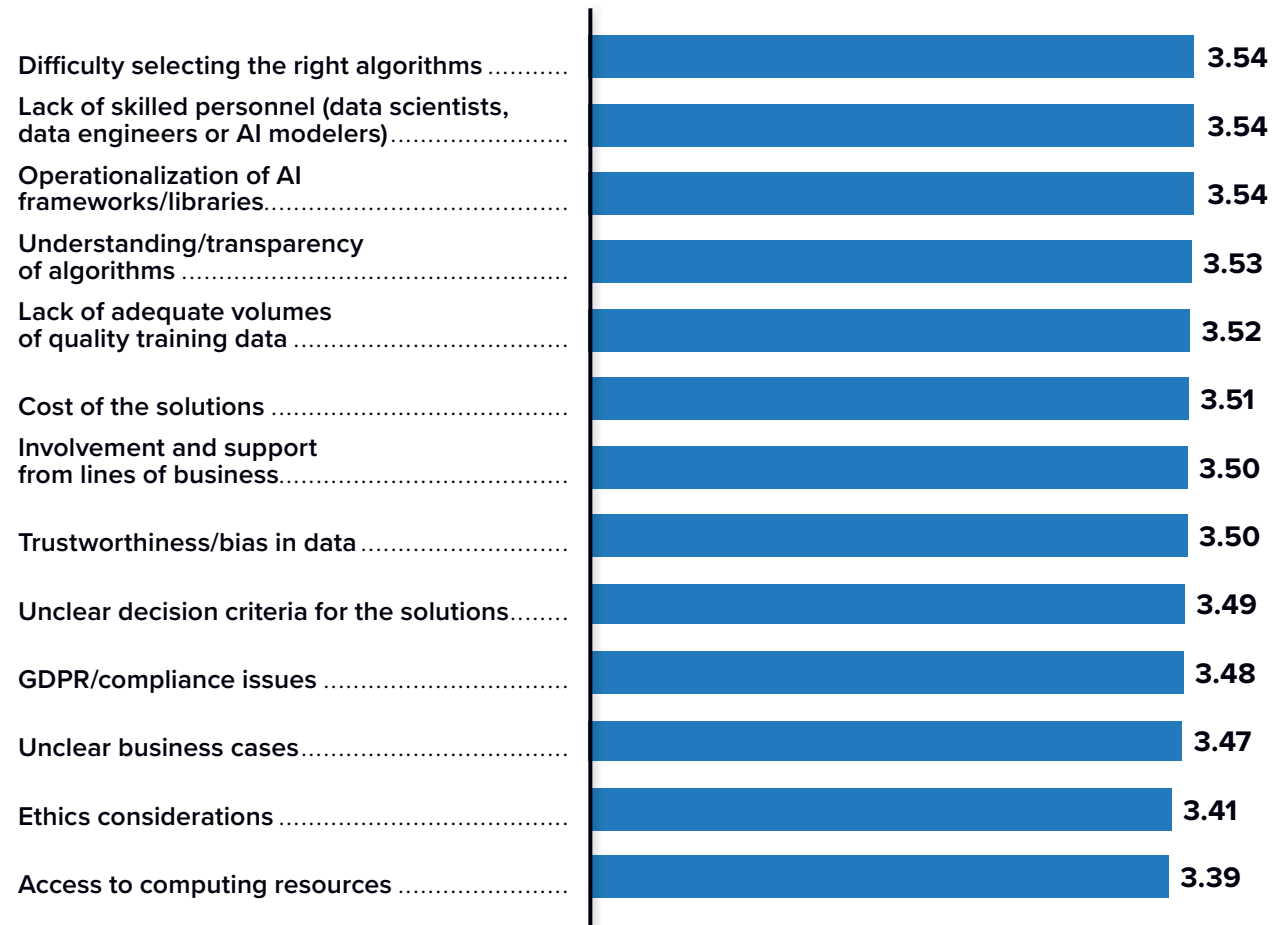
More than half

56%
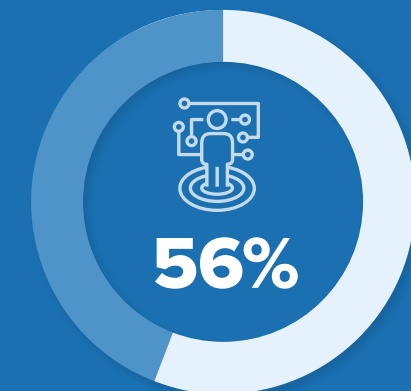
of respondents reported a positive impact of employee-focused AI-powered solutions.

Source: IDC's *AI StrategiesView 2021*, April 2021

Challenges in Implementing AI

On a scale of 1 to 5, please rate how challenging each of the following are in implementing AI technology at your organization, with 1 = least challenging and 5 = most challenging.

Challenge	Rating
Difficulty selecting the right algorithms	3.54
Lack of skilled personnel (data scientists, data engineers or AI modelers)	3.54
Operationalization of AI frameworks/libraries	3.54
Understanding/transparency of algorithms	3.53
Lack of adequate volumes of quality training data	3.52
Cost of the solutions	3.51
Involvement and support from lines of business	3.50
Trustworthiness/bias in data	3.50
Unclear decision criteria for the solutions	3.49
GDPR/compliance issues	3.48
Unclear business cases	3.47
Ethics considerations	3.41
Access to computing resources	3.39

Although AI spending is on the rise and early adopters report attractive ROI, **AI implementation continues to be a major challenge.**

Businesses report **skills shortage and operationalization issues** as the primary difficulties to implementing and scaling AI.
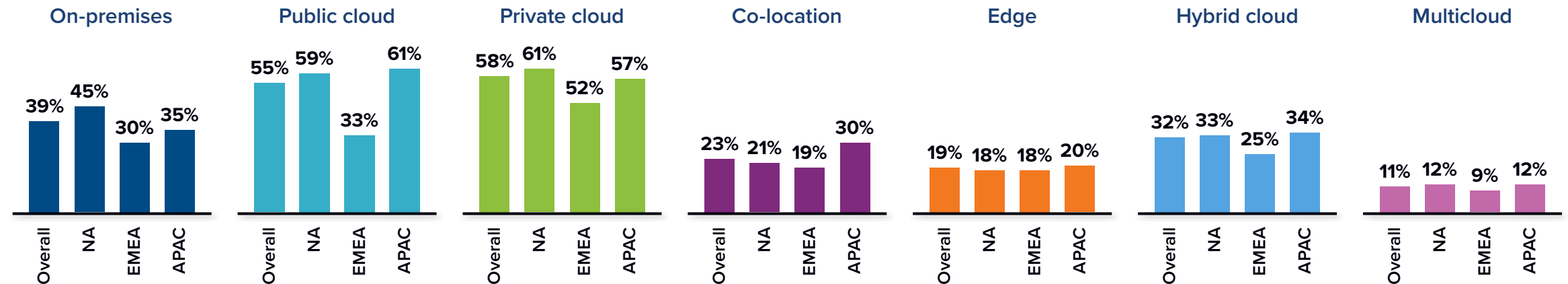
Key activities in automating the AI/ML life cycle include feature engineering, hyperparameter optimization, deploying a multistep pipeline, and automatically retraining and deploying models.

n = 1,920, Source: IDC's *AI StrategiesView 2021*, April 2021

AI/ML Solutions: Deployment Scenarios

Public and private cloud adoption is on the rise.

On-premises

39%	45%	30%	35%
Overall	NA	EMEA	APAC

Public cloud

55%	59%	33%	61%
Overall	NA	EMEA	APAC

Private cloud

58%	61%	52%	57%
Overall	NA	EMEA	APAC

Co-location

23%	21%	19%	30%
Overall	NA	EMEA	APAC

Edge

19%	18%	18%	20%
Overall	NA	EMEA	APAC

Hybrid cloud

32%	33%	25%	34%
Overall	NA	EMEA	APAC

Multicloud

11%	12%	9%	12%
Overall	NA	EMEA	APAC

As noted earlier, the barriers to entry for bringing AI capabilities to enterprises are high on many fronts. Specialized skills are required to build, train, and deploy machine learning models. The computational and special-purpose hardware requirements add up to higher costs for labor, development, and infrastructure. Cloud computing can solve these problems, and the leading public cloud platforms are on a mission to make it easier for companies to leverage machine learning capabilities without the full tech burden.

The cloud's pay-per-use model is good for bursty AI or machine learning workloads.

The cloud makes it easy for enterprises to experiment with machine learning capabilities and scale up as projects go into production and demand increases.

The cloud makes intelligent capabilities accessible without requiring additional employees or advanced skills in artificial intelligence, machine learning theory, and data science.
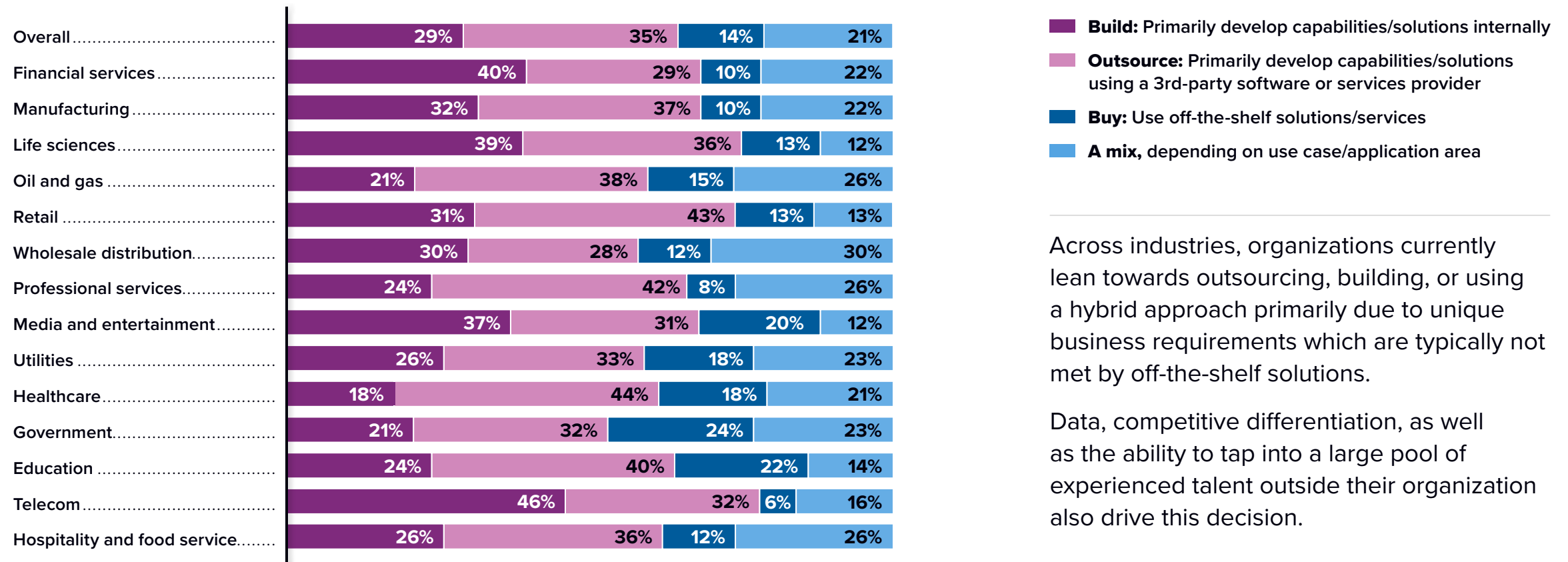
You don't need a cloud provider to build a machine learning solution. There are plenty of open source ML frameworks, such as TensorFlow, MXNet, and CNTK that companies can run on their own hardware. However, companies building sophisticated machine learning models in house are likely to run into issues scaling their workloads, because training real-world models typically requires large compute clusters.

Note: totals may not sum to 100% due to rounding. n = 2,000, Source: IDC's *AI StrategiesView 2021*, April 2021

How Industries Are Developing AI Capabilities

Organizations need to assess whether to build, buy, or outsource AI capabilities in their efforts to mitigate AI implementation challenges.

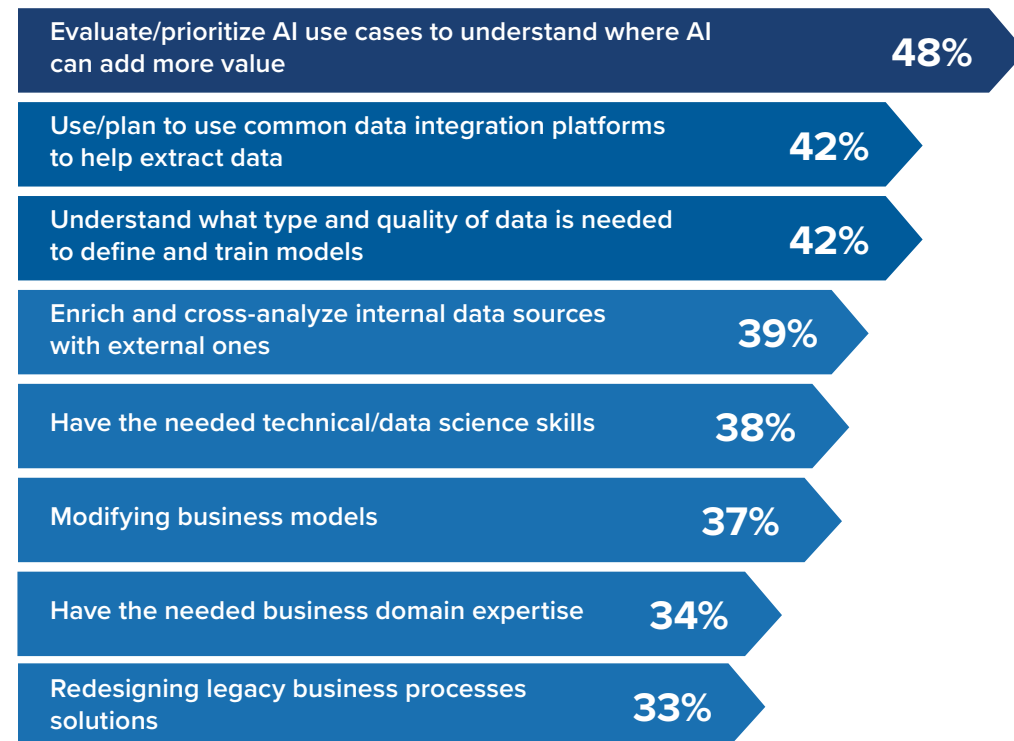**What is your primary approach to developing AI capabilities?**

Industry	Build	Outsource	Buy	A mix
Overall	29%	35%	14%	21%
Financial services	40%	29%	10%	22%
Manufacturing	32%	37%	10%	22%
Life sciences	39%	36%	13%	12%
Oil and gas	21%	38%	15%	26%
Retail	31%	43%	13%	13%
Wholesale distribution	30%	28%	12%	30%
Professional services	24%	42%	8%	26%
Media and entertainment	37%	31%	20%	12%
Utilities	26%	33%	18%	23%
Healthcare	18%	44%	18%	21%
Government	21%	32%	24%	23%
Education	24%	40%	22%	14%
Telecom	46%	32%	6%	16%
Hospitality and food service	26%	36%	12%	26%

Legend:
- **Build:** Primarily develop capabilities/solutions internally
- **Outsource:** Primarily develop capabilities/solutions using a 3rd-party software or services provider
- **Buy:** Use off-the-shelf solutions/services
- **A mix,** depending on use case/application area

Across industries, organizations currently lean towards outsourcing, building, or using a hybrid approach primarily due to unique business requirements which are typically not met by off-the-shelf solutions.

Data, competitive differentiation, as well as the ability to tap into a large pool of experienced talent outside their organization also drive this decision.

n = 1,920, Source: IDC's *Industry AI Path 2021*, August 2021

Methods for Ensuring the Return on Investment of AI

How does your organization ensure maximization of the business value/ROI for an AI initiative?

Evaluate/prioritize AI use cases to understand where AI can add more value	**48%**
Use/plan to use common data integration platforms to help extract data	**42%**
Understand what type and quality of data is needed to define and train models	**42%**
Enrich and cross-analyze internal data sources with external ones	**39%**
Have the needed technical/data science skills	**38%**
Modifying business models	**37%**
Have the needed business domain expertise	**34%**
Redesigning legacy business processes solutions	**33%**

ROI calls for a strong foundation, investment, and defined goals.

▶ Companies aiming to generate substantial ROI from AI need to lay a strong foundation with the right processes in place. Like any strategic initiative, this requires adequate investment.

▶ Set up business cases, implementation plans, and systems for measuring and monitoring AI performance.

▶ Develop basic AI capabilities around data management and robotic process automation. Then invest significant portions of your budgets on next-gen tools such as machine learning, deep learning, computer vision, and NLP.

▶ Move AI solutions from pilot to production, enacting change management to ensure AI adoption.

▶ Have defined goals to identify the problems to address with AI and the desired outcomes.

n = 1,920 (select all that apply), Source: IDC's *Industry AI Path 2021*, August 2021

Methods for Ensuring the Return on Investment of AI *(continued)*

Partnerships and collaboration are key ROI drivers.

Deriving ROI from AI implies employing the right talent, developing in-house AI skills via training, and promoting collaboration across the enterprise.

▶ AI is not a **"one-and-done" solution.** Executives need to consider the cost of maintaining and fine-tuning the AI application throughout the deployment, as well as providing staff with the proper resources and training. Good partnerships are crucial to success.

▶ Use **technology suppliers to plug in gaps** and leverage their embedded AI solutions to accelerate time to value cost-effectively and determine when and where requirements are met effectively.

Focus on translating results for key decision makers.

Generally, ROI on AI fails to live up to many companies' expectations due to the lack of corporate progress on measuring AI results.

▶ Ensure results are understandable, explainable, and trusted by non-data scientists. Help IT decision makers and stakeholders understand the AI's end results so they can put those insights into practice.

▶ Get decision makers involved in an initial "what does success look like" conversation to help them see that AI is achieving the desired results. Share evidence that the technology is doing its job and opening the door for more use cases and possibilities within the organization.

n = 1,920 (select all that apply), Source: IDC's *Industry AI Path 2021*, August 2021

Why Oracle for AI/ML-powered Business Transformation

Oracle's Technology Innovation and AI

Oracle's breadth of experience in helping customers create and manage intelligent data is creating **a pervasive user experience and helping customers personalize the way they embrace AI.**

Oracle's business model enables customers to buy an out-of-the-box solution for a common business use case, easily extend existing cloud applications with AI features, or build their own AI models and applications to perform unique tasks according to their business needs. Oracle provides intelligence connected across applications: Organizations running multiple applications on the same platform can easily connect the dots between the front and back office for deeper business insight, more informed recommendations, and improved efficiency.

Designed for enterprise workflows

- ▶ Oracle understands business demands and trends and is 100% focused on innovating enterprise workflows.

- ▶ Oracle solutions are built on industry experience derived from working with thousands of customers.

- ▶ Oracle's prebuilt models are trained on industry data.

Tight integration across services

- ▶ Oracle is focused on providing consistent user experience across business functions and personas through tight integration.

- ▶ AI is available to developers, data scientists, business users, across data lakes, databases, and business applications.

- ▶ Oracle has the fast-follower advantage. It has leveraged industry learnings to build AI right.

Support for your favorite ML tools

- ▶ Oracle is committed to being open and extensible.

- ▶ Oracle has embraced open source, which allows customers to co-innovate in a responsible and transparent way.

- ▶ Oracle is engaging in meaningful partnerships to bring the best of AI together.

Oracle Makes AI Available in Three Key Ways

1 **Machine learning services** Oracle Cloud Infrastructure Machine Learning Services help data scientists with the entire ML model life cycle.

2 **AI services** Oracle Cloud Infrastructure AI Services are prebuilt, customizable ML models.

3 **AI applications** Prebuilt AI capabilities are embedded into Oracle software-as-a-service (SaaS) applications.

Oracle AI Marketecture Today

A unified artificial intelligence and machine learning platform spans cloud services, apps, and data assets.

AI APPLICATIONS

Oracle Cloud Infrastructure AI Services

OCI Digital Assistant	OCI Language	OCI Speech	OCI Vision	OCI Anomaly Detection	OCI Forecasting

OCI Data Science	Machine Learning in Oracle Database	OCI Data Labeling

Oracle Cloud Infrastructure Machine Learning Services

DATA
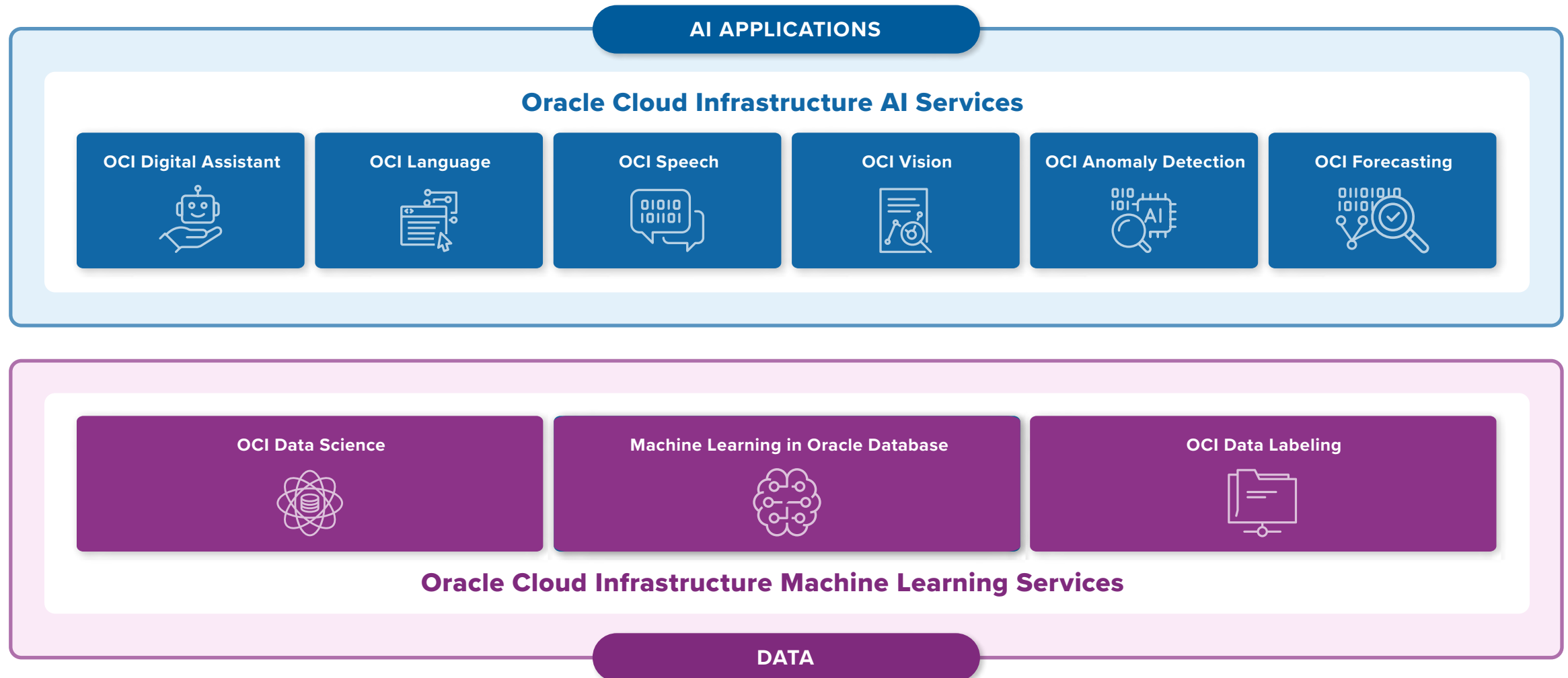
Oracle Cloud Infrastructure AI Services

OCI AI Services is a collection of prebuilt machine learning models that developers can **easily add to their applications and business operations:**
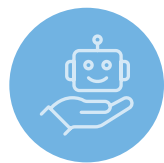
Oracle Digital Assistant

OCI Vision

OCI Language
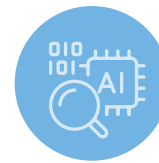
OCI Anomaly Detection

OCI Speech

OCI Forecasting

These models, which can be further custom-trained on an organization's own business data, have been pretrained on industry data which helps them deliver more accurate results. **Developers can now focus on accelerating application development without sacrificing data science capabilities.**

Oracle Digital Assistant
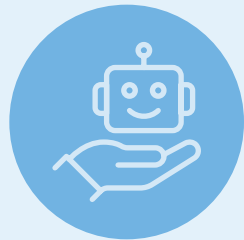
Conversational AI service that offers text, chat, and voice chatbots

Language and intent machine-learning capabilities for business users

Prebuilt chatbots and customizable templates

Create a single interface to route users to the right answers for a more seamless experience

▶ Almost 700 live customers with business-wide use cases

▶ Business-level insights into usage and adoption

▶ Seamless integration with human agent customer service

▶ Enterprise focus for line-of-business and app developers

▶ Certifications: FedRamp, GDPR, C5, HIPAA, ISO/IEC 27001:2013, ISO/IEC 27017:2015, ISO 27018:2014 (PII), PCI
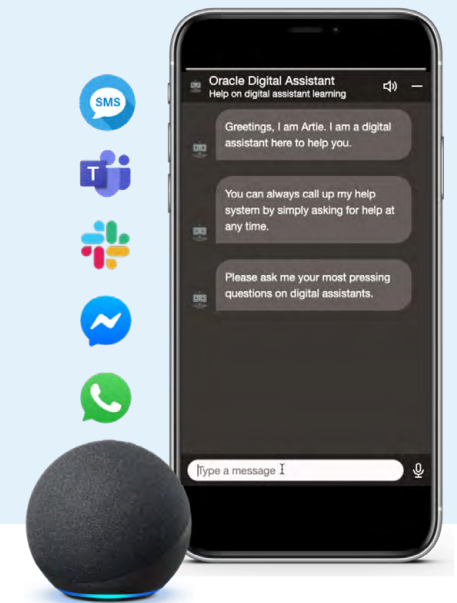
Oracle Language

Models pretrained on industry data

Language analysis with no data science expertise needed

Language detection of your text

Identification of key phrases and entities in text

Content classification into more than 600 categories and subcategories to support data analysis

Aspect-level sentiment analysis
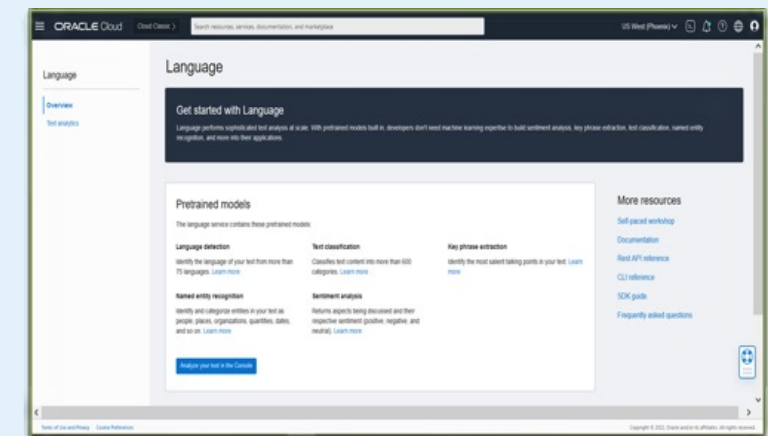
OCI Speech
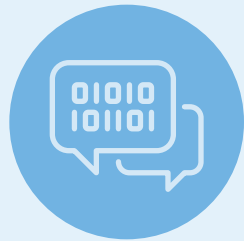
Automatic transcription of audio and video files into text using advanced deep learning techniques

No data science expertise required

Data processed directly in object storage; no data movement needed

Time-stamped, grammatically accurate transcriptions

INPUT AUDIO SIGNAL

OCI SPEECH

OUTPUT TEXT

Text Transcript

"Good afternoon, everyone, and welcome to Oracle's fourth-quarter and fiscal-year 2021 earnings conference call. A copy of..."
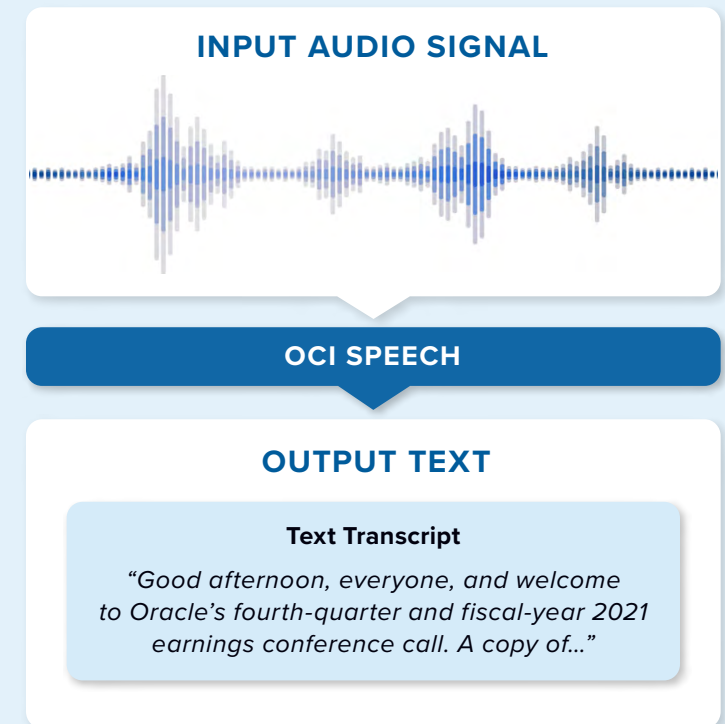
OCI Vision

Pretrained, customizable computer vision models and fully managed model infrastructure with "Auto AutoML"

Automatic classification of documents into different types based on visual appearance, language, and extracted keywords

Hybrid models that combine visual and text algorithms with more accurate results

Complete integration with OCI Data Labeling to simplify data labeling and provide more accurate models
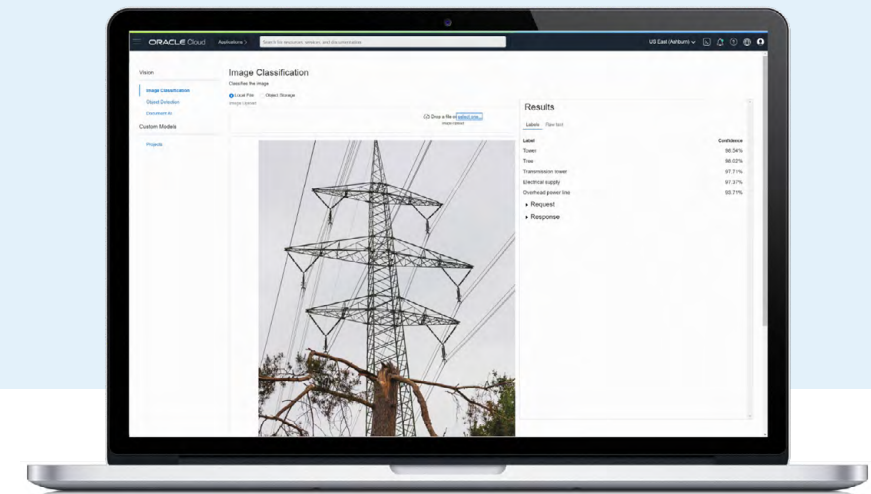
OCI Vision *(continued)*

Image analysis

▶ Image classification

▶ Object detection

Auto design.........**99.26%**
Car.............................**99.26%**
Bumper.................**99.23%**
Wheel....................**98.95%**

Document AI

▶ Text recognition

▶ Document classification

▶ Language detection

▶ Table extraction

▶ Key value extraction

OCI Anomaly Detection
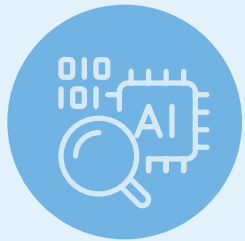
Multiple anomaly detection models automatically select the most accurate to flag critical incidents earlier

Automatic identification and remediation of data quality issues

Industry-leading, proven anomaly detection techniques (MSET-2)

Anomaly detection across multiple sensors to increase accuracy
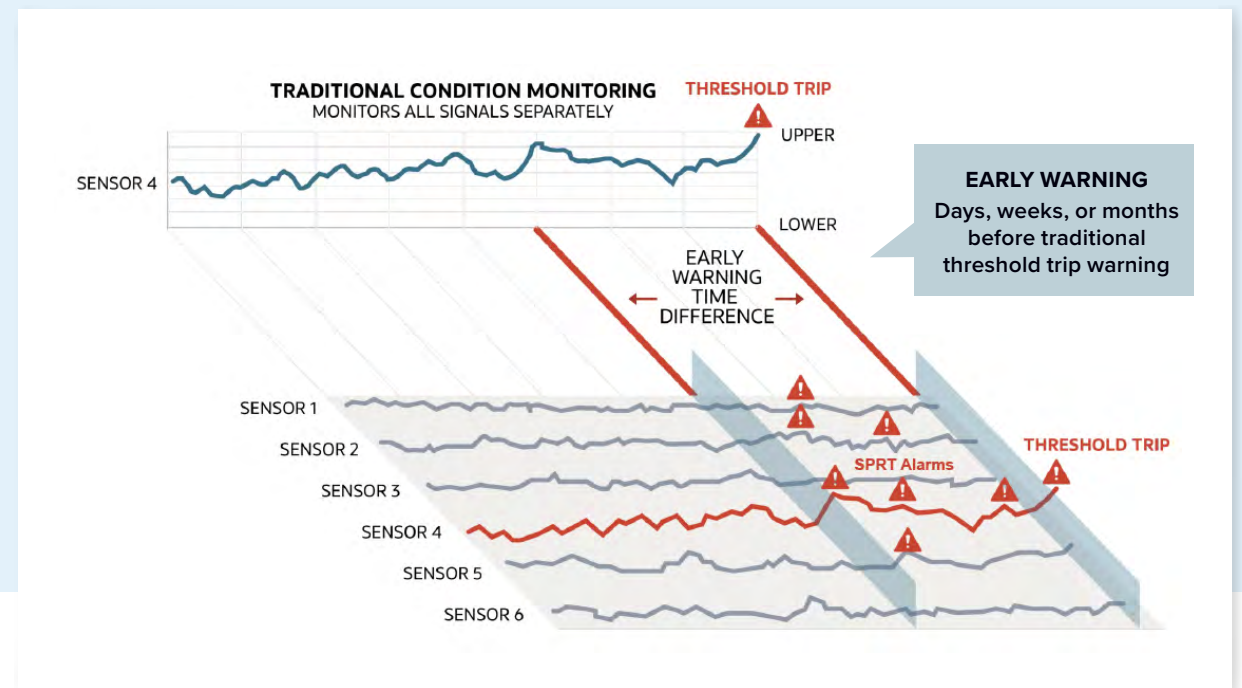
Introducing OCI Forecasting Service

Forecast any time series metric:
product demand, revenue, or number of
service requests

Build multiple models and automatically
select the most accurate one for
your business

Deliver forecasts with explainability,
bringing transparency to predicted results

Sales Forecast
2021/01/16: **forecast**: 655.61 **upper** : 1119.4 **lower**: 191.81

Fitted   Sales   Forecast   Lower   Upper
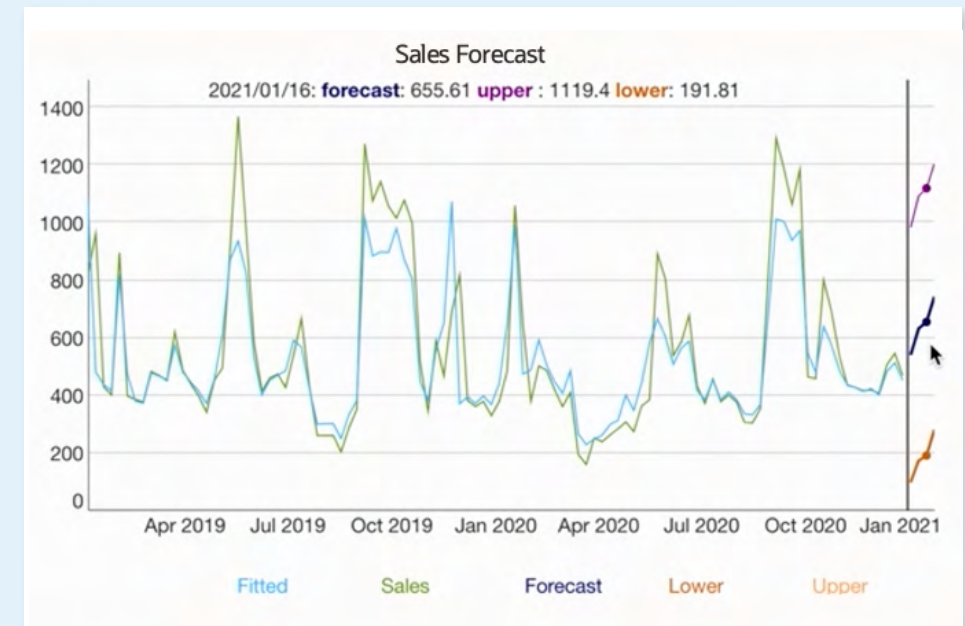
Oracle Cloud Infrastructure Machine Learning Services

For data scientists who want to build custom machine learning models or solve a business problem that isn't covered by the Oracle Cloud Infrastructure (OCI) AI Services, **Oracle provides ways to build and deploy end-to-end machine learning (ML) models.** These services include:
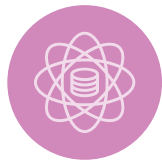
OCI Data Science

An end-to-end machine learning service that offers JupyterLab notebook environments and access to hundreds of popular open source tools and frameworks. Build and train ML models with NVIDIA GPUs, AutoML features, and automated hyperparameter tuning. Deploy models as HTTP endpoints or use Oracle Functions. Manage models through version control, repeatable jobs, and model catalogs.
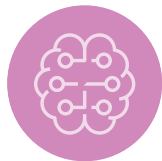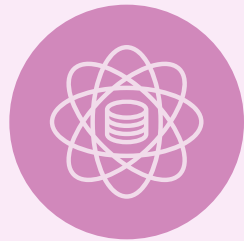
Machine Learning in Oracle Database

High-performance and scalable in-database machine learning algorithms accelerate the creation and deployment of machine learning models with Oracle Database and Oracle Autonomous Database. APIs for SQL, Python, and R, along with no-code user interfaces make machine learning accessible to both data scientists and non-expert users.

OCI Data Labeling

Build labeled data sets to more accurately train AI and machine learning models. Developers and data scientists can assemble data, create and browse data sets, and apply labels to data records through user interfaces and public APIs. The labeled data sets can be exported for model development across Oracle's AI and Machine Learning Services for a seamless model-building experience.
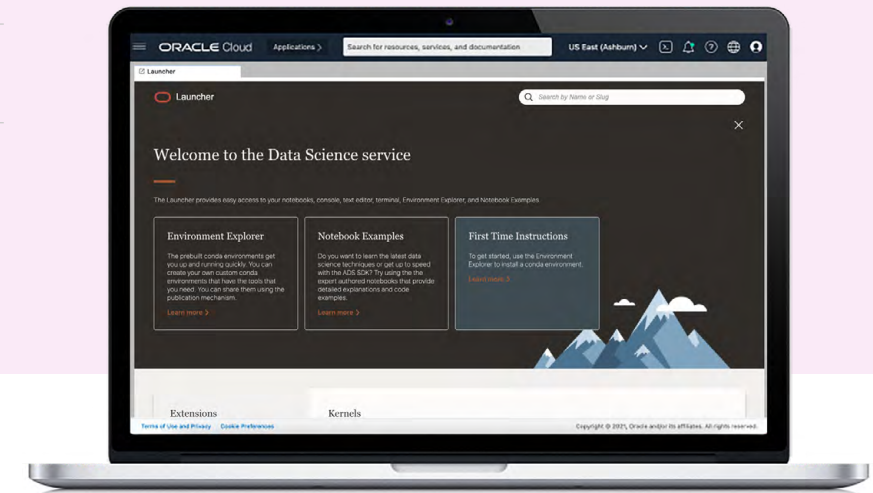
Oracle Cloud Infrastructure Data Science
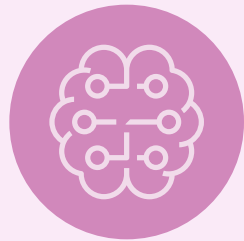
Best for working with data anywhere

Wide set of Python open source algorithms and frameworks

Scalable infrastructure to support specific needs

Supports AutoML, automated Python algorithm selection and tuning

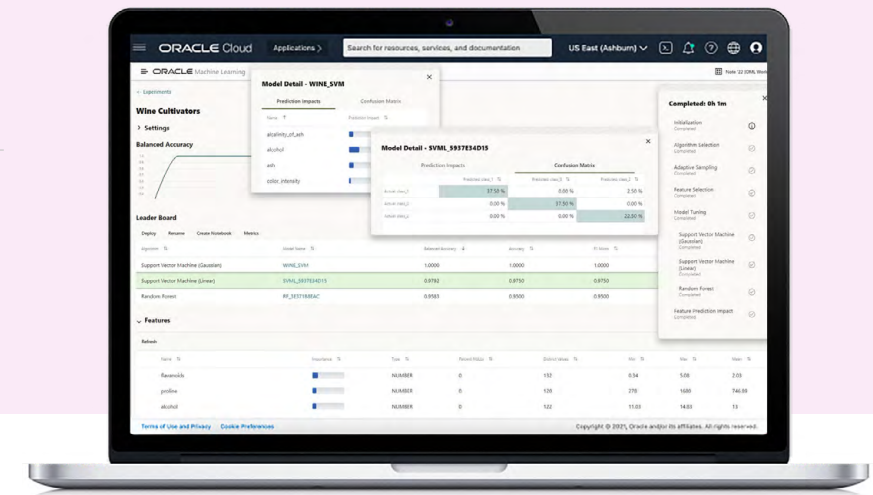# Machine Learning in Oracle Database

Best for working with data in Oracle Database

Optimized algorithms in Oracle Database

Supports machine learning with SQL, R, Python, and REST APIs, and no-code user interfaces

AutoML, automated in-database algorithm selection, feature selection, and model tuning
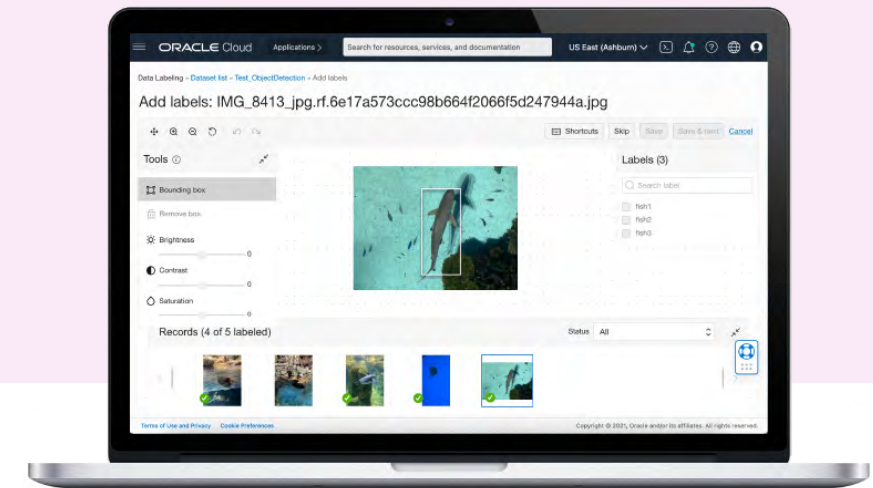
OCI Data Labeling

Build enriched, labeled data sets to more accurately train AI and machine learning models

Simplified data labeling by providing a consistent UI experience

Labels for images, text, and documents

Faster data labeling with custom templates and multiple annotation formats

Easy exportability

Oracle's Comprehensive AI Offerings

A suite of AI features is embedded into Oracle software as a service.

Oracle AI Apps operationalize embedded machine learning across SaaS applications to deliver quality ML predictions across multiple domains for business software customers.
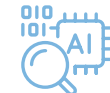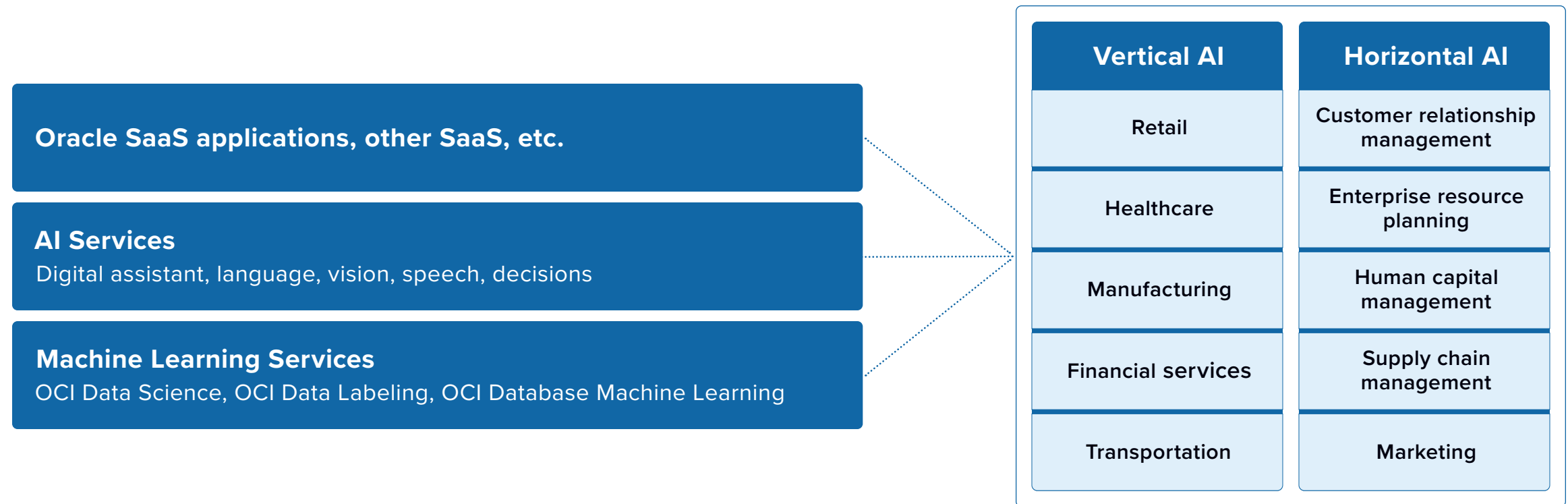
Oracle offers breadth, depth, and a data foundation to deliver intelligent features in:

▶ Finance (payables and receivables)
▶ Recruiting
▶ Talent management
▶ Supply chain management
▶ Sales
▶ Service
▶ Marketing

Human capital management

Enterprise resource planning

BUSINESS

Customer experience

Supply chain management
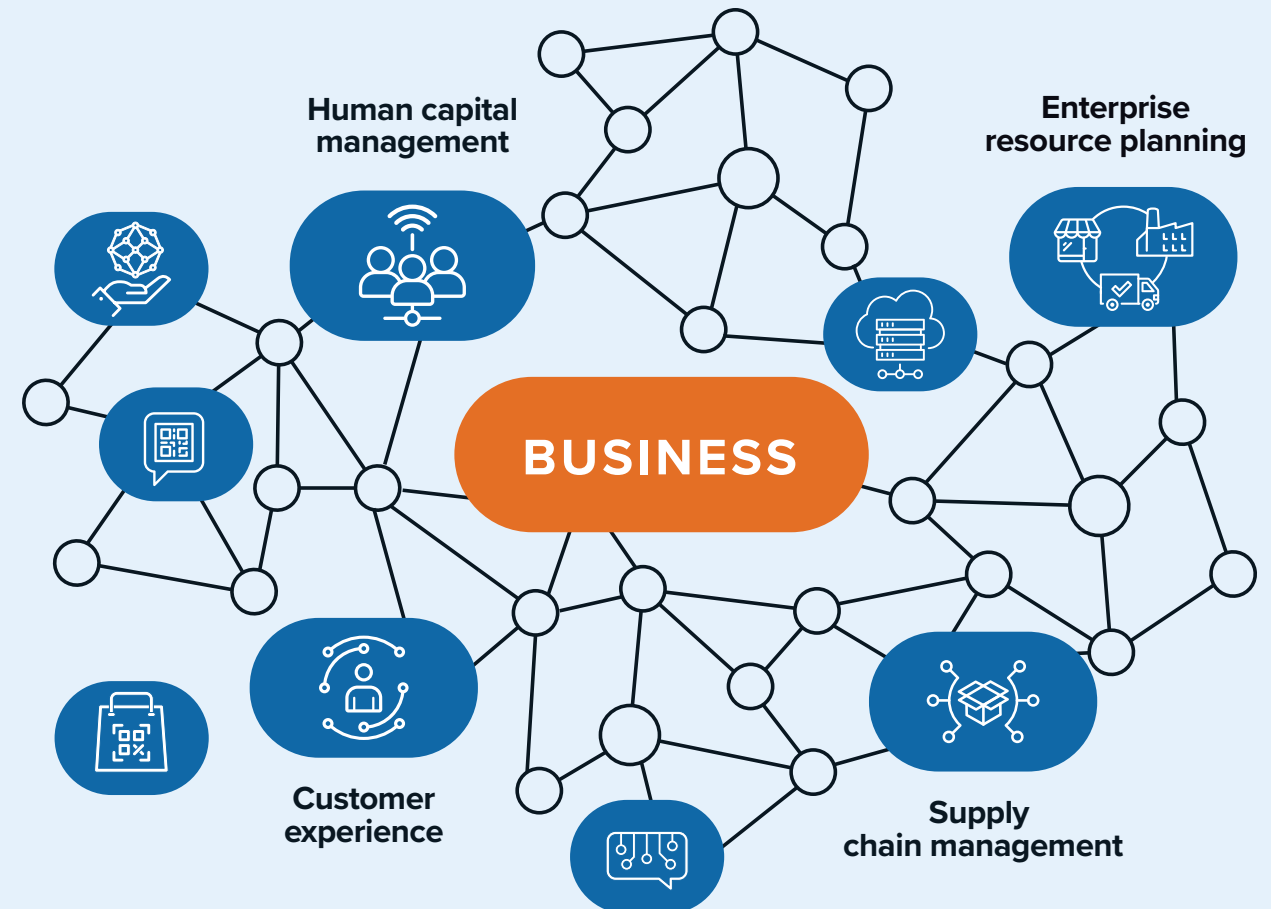
Oracle AI Marketecture

A unified artificial intelligence and machine learning platform spans cloud services, apps, and data assets.

Oracle SaaS applications, other SaaS, etc.

AI Services
Digital assistant, language, vision, speech, decisions

Machine Learning Services
OCI Data Science, OCI Data Labeling, OCI Database Machine Learning

Vertical AI	Horizontal AI
Retail	Customer relationship management
Healthcare	Enterprise resource planning
Manufacturing	Human capital management
Financial services	Supply chain management
Transportation	Marketing

Oracle AI Customer Success Scenarios

Children's Medical Research Institute

As a leading medical institute that conducts research into children's genetic diseases, Children's Medical Research Institute (CMRI) needed a powerful AI platform to aid them in the fight to cure children's cancer.

With Oracle AI, CMRI has improved the quality of its research, can run experiments faster, and can better focus on detailed analysis.

CMRI embraced OCI Data Science to improve flexibility and scalability, discover new insights, and perform analysis faster. Future projects with OCI Vision and OCI Data Labeling will allow CMRI to innovate and scale faster. CMRI partnered with OCI over AWS and Google to move disparate data sources to a single, unified OCI platform.

University of Oxford

University of Oxford researchers have created an AI application that predicts career pay, aiming to help job seekers make informed decisions based on salary differences for the same job, no matter the location.

OCI Data Science allows researchers to easily scale compute resources without needing to manage GPU servers. They liked the platform's simplicity and collaborative, project-driven environment. They benefit from its unique features for data profiling, model development, and model explanation, as well as the flexibility of using various algorithms and frameworks.

Seattle Sounders FC

The major league soccer club uses sports analytics to help improve team performance with Oracle Cloud Infrastructure Data Science and OCI's data lakehouse.

They selected Oracle for its flexible data science platform that would let their data scientists do what they do best. With Oracle, they don't have to worry about back-end data infrastructure. The team evaluated the Oracle data aggregation capabilities, performance, and usability of Oracle Analytics and OCI Data Science. After the transition to Oracle, Sounders FC was easily able to connect their data with minimal schema changes. They have found the data science tools to be straightforward to learn and use.

The Seattle Sounders evaluated the Oracle data aggregation capabilities, performance, and usability of Oracle Analytics Cloud and Oracle AI.

Essential Guidance

We have now entered the domain of AI-augmented work and decision making across all the functional areas of a business. AI, machine learning, and NLP are changing businesses around the globe across multiple industry sectors. AI disrupters drive better customer engagements and have accelerated rates of innovation, higher competitiveness, higher margins, and superior employee experiences. Organizations must evaluate their vision and transform their people, processes, technology, business models, and data readiness to unleash the power of AI and thrive in the digital era.

AI implementation continues to be a major challenge.
An organization that wishes to accelerate the AI adoption and time to value should:

▶ Establish an organization-wide AI strategy aligned with business goals

▶ Decide whether to build, buy, or outsource AI capabilities to mitigate implementation challenges

▶ Be data driven and focus on eliminating bias and improving data quality

▶ Establish machine learning operations (MLOps) along with scalable and cost-efficient infrastructure architecture to support the life cycle

▶ Address AI-specific risks and biases proactively and aggressively

▶ Have ongoing enterprise governance practices performed jointly by IT and those in business and compliance functions

Partner with a trusted, innovative technology supplier like Oracle. Oracle's business model enables customers to buy an out-of-the-box solution for a common business use case, easily extend existing cloud applications with AI features, or build their own AI models and applications to perform unique tasks according to their business needs. Oracle's breadth of experience in helping customers create and manage intelligent data is creating a pervasive user experience and helping customers personalize the way they embrace AI. Look for ongoing innovations from Oracle in AI to help you reimagine your business.

About the Analyst

Ritu Jyoti
Group Vice President, Worldwide Artificial Intelligence and
Automation Research Practice, Global AI Research Lead, IDC

Ritu Jyoti is group vice president, covering worldwide artificial intelligence and automation research with IDC's Software Market Research and Advisory practice. Ritu is responsible for leading the development of IDC's thought leadership for AI research and managing the research team. Her research focuses on the state of enterprise AI efforts and global market trends for the rapidly evolving AI and machine learning innovations and ecosystem. She also leads insightful research that addresses the needs of AI technology vendors and provides actionable guidance on how to crisply articulate their value proposition, differentiate, and thrive in the digital era.

More about Ritu Jyoti

Message from the Sponsor

When it comes to making AI successful, what organizations need is AI designed to create business impact. That's why Oracle, with information gained from building its wide suite of business applications, has created services to build machine learning models from scratch in addition to prebuilt AI models designed for industry use cases. By making it easier for organizations to train AI models on data generated from SaaS applications, models become more accurate and impactful to the bottom line. Oracle has continually innovated across its AI platform and rearchitected AI from the ground up to create a platform tailored to for businesses seeking to improve their bottom line.

About Oracle AI

Oracle AI is a family of artificial intelligence and machine learning services. Developers as well as data scientists can add prebuilt models to applications and operations. Data scientists can also build, train, and deploy models with favorite open source frameworks or choose to benefit from the speed of in-database machine learning.

To learn more, visit Oracle.com

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