

10 You-can-do-this-today artificial intelligence use cases

Need to improve worker productivity, detect fraudulent transactions, or increase sales—without massive investments?

AI can help. Solutions are available now that can transcribe and summarize spoken text, distinguish between legitimate and malicious activity, and even scan through millions of social media posts to spot trends and perform sentiment analysis in real time.

Ready to see what AI can do for you?

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What is AI?

Artificial intelligence is a broad category encompassing many technologies.

AI delivers new capabilities into applications that support business process workflows, such as those encountered in finance, human resources, sales, customer service, and procurement. These AI capabilities improve workflows by automating tasks and generating insights to make better decisions.

Some AI functions need vast quantities of cloud computing power; others can run on a typical smartphone or embedded device. For many organizations, AI is already part of the workflow, delivered as advanced capabilities baked into software used for finance, human resources, sales, customer service, and procurement.

Because the field is vast and evolving, there is no definitive list of AI capabilities. That said, here are five of the most common AI technologies in use today, either as software features or integrated using APIs.

- 1 Digital assistants** apply deep semantic parsing using natural language processing and understanding as well as custom algorithms to derive accurate intent and context from conversations. With digital assistants that understand their business-specific vocabulary, employees and customers can communicate with applications using voice commands.
- 2 Speech recognition systems** create accurate, real-time transcripts from natural conversations or convert recorded audio conversations to textual data to analyze with AI services. Speech recognition is increasingly multilingual, with the ability to translate between multiple languages instantaneously.
- 3 Language services** detect and translate languages in written text and automatically recognize specific types of content, including the names of people, locations, products, and organizations. These services can also analyze the mood or tone of the text as positive, negative, or neutral with a confidence score and automatically classify text based on key words and phrases.
- 4 Vision recognition** extracts textual or visual information from still and moving images and uses that data to drive analytics applications. These AI tools can enrich image-based files with metadata tags, such as descriptions of objects; those tagged images can be indexed for uses such as intelligent search and retrieval. With the right training, the system can also detect anomalies in photographs and videos, which is why vision recognition is currently being used in manufacturing applications such as automatic quality control.
- 5 Document understanding** automatically extracts text and key-value pairs from a variety of digital or scanned files, including those that are rotated, tilted, or even deteriorated. This can help with applications such as expense processing, by reading receipts, or logistics, by understanding bills of lading. These tools can also identify and extract table structure from documents and sort documents into common categories.

Generative AI: Ready for prime time

Generative AI creates new content in the form of images, text, audio, or even software code.

Examples of generative AI systems include ChatGPT, which can answer questions, summarize text, or carry out instructions by generating a written response to a query, and Dall-E, which generates images in a variety of styles based on commands.

Generative AI is being embedded into business applications to work with and augment other AI functionality, such as automatically generating a draft job or product description, drafting a doctor's discharge note, or concisely summarizing an article to answer a customer support inquiry.

Generative AI can summarize documents, information from databases, or other data in written form and make the output from interactive chatbots seem more natural. *(A chatbot is an interactive program that can converse with a customer or employee in real time using typed text.)*

3 generative AI capabilities



Assisted authoring

Using a short prompt, generative AI capabilities can quickly create content, such as job or new product descriptions, for review, revision, and approval.



Suggestions

Quickly guide users to better results based on natural language processing and best practices. Generative AI can also offer recommendations for survey questions or professional development tips for managers to provide to employees. For example, a customer service application can suggest a how-to article based on the customer's inquiry.



Summarization

Increase efficiency by identifying key insights from one or more data sources. New generative AI capabilities can explain the key elements of content for simple and impactful consumption. For example, a customer service agent can ask for a summary of a knowledge base article to resolve a customer service inquiry or deliver a concise text summary from a table or chart.



Why is AI important?

Consumer-facing AI products are all over the news, but AI has plenty of practical business uses. Whenever you use a spelling or grammar checker, that's artificial intelligence. Does your marketing team make product recommendations to increase upsells? Can finance process more invoices, more accurately and with fewer staff?

Thank AI.

In fact, many of the best AI products for businesses aren't products at all. They are features and functions integrated into mission-critical applications, such as enterprise resource planning (ERP), logistics, accounting, or human resources management.

These new features have one thing in common: sophisticated pattern-matching algorithms that, once trained, apply patterns to help humans do tasks or solve problems using capabilities such as speech recognition, image classification, and document understanding.

The data sets used by AI to train accurate models can be huge, and the amount of computing horsepower required to train AI systems can be substantial. Organizations may choose to use their own data—either structured, such as a database, or semistructured/unstructured, such as text, graphics, audio, or video—to create custom models.

Four consumer-facing use cases

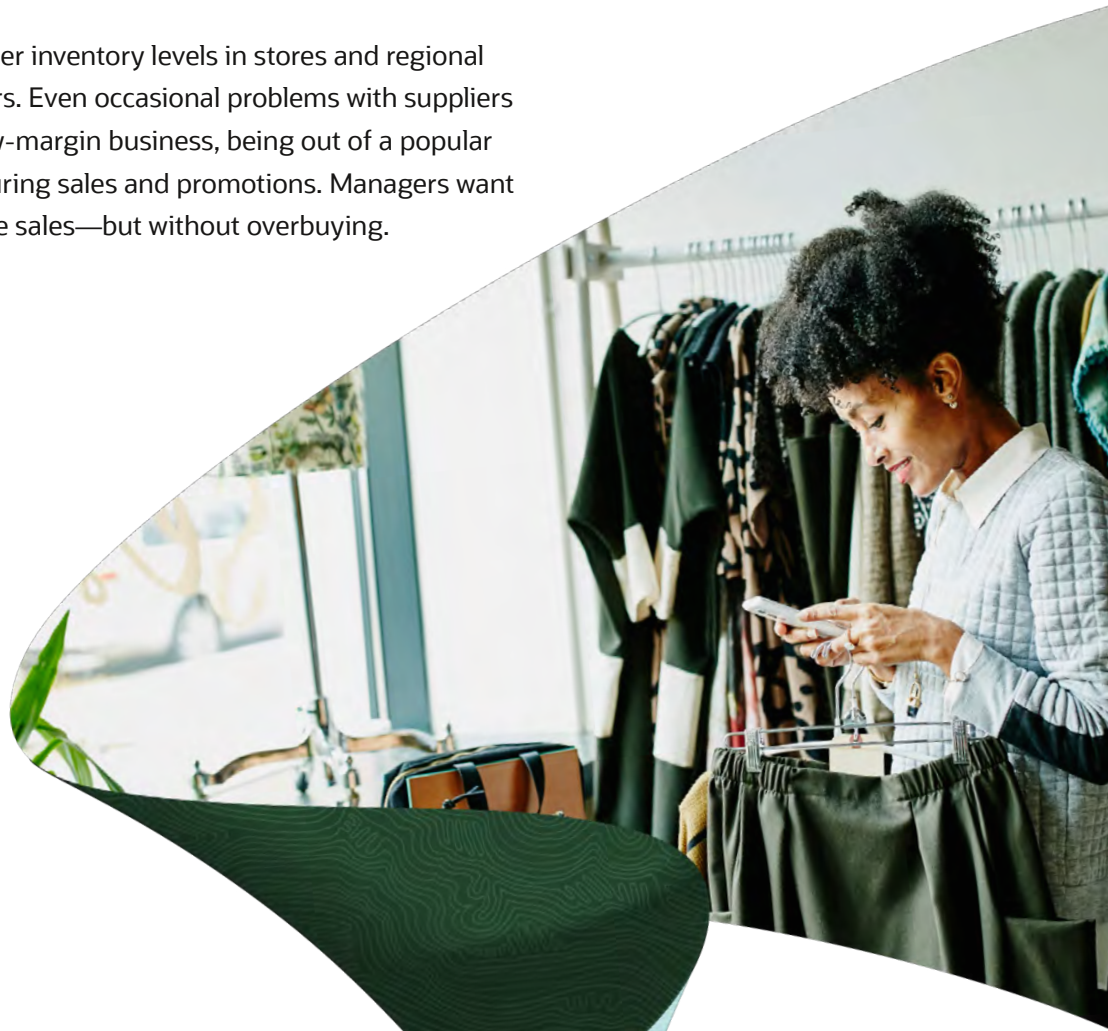
Retailers operate in a complex, interconnected world of customers, partners, suppliers, products, services, and markets. AI can help maximize efficiency while providing an opportunity for employees to delight customers.

1 Retail

Supply chain optimization

Customer: A retail clothing line with dozens of brick-and-mortar stores.

The problem: Maintaining proper inventory levels in stores and regional warehouses is critical for retailers. Even occasional problems with suppliers can lead to stockouts. In this low-margin business, being out of a popular SKU is especially challenging during sales and promotions. Managers want to delight shoppers and increase sales—but without overbuying.



The AI solution: The retailer has multiple information sources, ranging from point-of-sale terminals to warehouse inventory systems. It also has insights into delivery schedules from suppliers to warehouses and from warehouses to stores.

The business's enterprise resource planning system records historical sales data, which includes external factors such as seasonality, weather patterns, and results of marketing campaigns and promotions. Advanced data management systems integrate this information into a massive data set, which is then modeled by data scientists and inputted into a forecasting model that can make predictions, such as demand increase due to a holiday or planned marketing promotion, and determine the time required to acquire and distribute the extra inventory.

The AI model can be proactive: For example, it can alert the retailer that the sales of certain items are exceeding the ability to restock in some locations and suggest that promotional offers be used to redirect customers to other products.

Most ERP-based forecasting systems can produce sophisticated reports. A generative AI report writer goes further, creating custom, plain-language summaries of these reports tailored for each store, instructing managers about how to maximize sales of well-stocked items while mitigating possible shortages.

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2 Hospitality

Customer feedback analytics

Customer: A hotel chain that depends on positive ratings on social media and review websites.

The problem: The hotel chain can't keep track of its online reviews. There are too many postings, comments, and hash-tagged mentions for customer service staff to track and analyze, leading to missed opportunities to engage unhappy customers complaining on social media. Corporate executives are unable to track sentiment trends. Hotel managers don't know what's being said fast enough to address problems in real time.

The AI solution: The hotel can create a large data set from the tens of thousands of previously published online reviews on sites such as Yelp, TripAdvisor, its own Facebook page, booking websites as well as comments scraped from social media, by looking at mentions and hashtags. A textual language AI system can perform a sentiment analysis across that data set to determine a baseline that can be periodically reevaluated to spot trends.

Taking it up a notch, data scientists could build a model that correlates those textual messages—and their sentiments—against specific hotel locations, their occupancy levels, staffing on specific dates, and other factors such as weather. AI can determine if there are signals that could warn individual hotels of situations that may lead to complaints so that remedial action can be taken in advance.

With AI, the hotel can be alerted to problems in real time by scanning social media and other channels, comparing the data against the model and running it through a sentiment analysis.

Generative AI can extract valuable suggestions and insights from both positive and negative comments. Perhaps customers in one location have problems with parking. Out-of-date guest rooms and inconvenient breakfast hours are generating buzz at another property. The buffet at another location gets lots of enthusiastic shout-outs. AI can spot those trends, even if the phrasing isn't identical. This use of AI can go beyond sentiment analysis to offer proactive guidance to individual managers and the corporate headquarters, enabling it to continually improve its guest experiences.

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3 Car rental

Enhanced call center experiences

Customer: A car rental company with a busy reservation hotline.

The problem: The call-center manager wants to give every customer a great experience while minimizing the number of calls placed on hold or transferred to supervisors. But calls keep coming in. People call the hotline for any number of reasons: to make reservations; ask for changes, cancellations, or a better price; or for help finding pickup/drop-off locations. Customers call when they are having a crisis, such as a flat tire, or when they simply can't figure out how to open the trunk.

The AI solution: At the call center, various AI technologies can be combined to act as an invisible assistant for agents, transcribing each call in real time, performing sentiment analysis to discover meaning, and advising agents through onscreen information displays and chatbot-like windows. For example, speech recognition AI can detect essential information, such as the customer's name, the rental car city, the account number, and the rental policy number, and display this information to the agent.

A generative AI system, underpinned by a large language model (LLM) and a knowledge database, can understand many common questions and can feed answers back to the agent. Can't find the rental desk? The AI can provide the agent with a map and create directions. In an accident? The AI can trigger automatic responses while prompting the agent on the essential questions to ask.

AI technology can also assist the agent by assessing the caller's emotional responses, whether happy, stressed, angry, or confused. It may offer suggestions for de-escalating a confrontational situation and prompt the agent to offer discounts, upgrades, bonus frequent-renter points, or other accommodations. After the call, the AI system can help assess the call quality and customer satisfaction, with feedback for the agent and the manager.

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4 Warehouse

Talent requirements and job description generation

Customer: A large warehouse and shipping center that hires hundreds of full-time, part-time, and seasonal employees each year.

The problem: The process of forecasting hiring needs and timelines and generating the job descriptions can be time consuming for HR, creating a bottleneck in the hiring process. Managers need to know when to begin the recruiting process because some positions are harder to fill than others. And while many of the jobs seem similar, there are sufficient differences to affect job descriptions and pay scale.

The AI solution: Using its database of current and past employees, HR can train an AI model to predict how long workers are likely to stay in a position. The AI model takes into account the details of each job category as well as the age of employees, starting pay, history of raises and bonuses, and typical seasons when workers may leave, such as right before the beginning of a school year. Based on that information, the AI system can make reasonable predictions to estimate the number of openings and when those openings may occur. When coupled with historical data regarding advertising and start dates, the AI model can advise HR on when to begin a search for those workers.

The HR department can feed its job description database into a data model (a visual representation of data elements and their connections) to generate checklists for hiring managers and HR staff to use when preparing to hire specific roles. Generative AI can then take those checklists and create textual drafts of job descriptions and matching job ads formatted to the styles of specific job boards and other posting sites.

The result: Using these predictive models, HR can more accurately plan for hiring requirements throughout the year, minimizing both staff shortfalls and the time spent preparing job descriptions and ads for open positions.

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Three regulated industry use cases

Regulated organizations must carefully balance serving their primary missions while remaining compliant. AI can assist them in improving services while also increasing efficiency.

1 Healthcare

The patient's journey

Customer: A fast-growing medical practice that needs scheduling help.

The problem: The mechanics of medical appointments can be frustrating for everyone involved: patients, receptionists, nurses, and physicians. There are many time-consuming steps—including scheduling, checking in, interactions with the doctor, checking out, and follow-ups. Trained staff are hard to hire, and the rules regarding handling of patient records leave little room for error. To earn good ratings, practices need to improve patient satisfaction by delivering shorter wait times and less bureaucracy. Medical professionals also appreciate productivity advances that allow them to treat more patients per day.



The AI solution: Electronic health records open a world of potential benefits. Using computer vision and document understanding, for example, a diagnostic system can analyze lab results as they are submitted to the practice, summarizing them for the doctor's review as preparation for a patient visit. AI can interpret paper forms, scanned images, and tests, such as X-rays and CT scans, as well as structured data to offer one or more possible analyses for the doctor, considering the latest research and the patient's history.

Generative AI can summarize transcripts from the visit, as well as lab results and the doctor's diagnosis, and prepare a draft of these materials for medical staff to edit and approve, thereby saving time. If the doctor recommends a specific exercise regimen, for example, the generative AI model can prepare instructions that consider factors such as a recent knee replacement or a preference for swimming over walking.

With generative AI, medical practices can deliver positive health outcomes while seeing as many people as possible. And in the process, practices can reduce costs, improve earnings, and provide human-centric experiences for patients who receive better treatment faster.

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2 Financial services

Customer verification and fraud protection

Customer: A regional bank needs to detect fraud more quickly and effectively.

The problem: Unfortunately, fraud can creep into any part of a bank's retail operations. Branches may encounter fake documents being used to open accounts and stolen checks being deposited. Fraud can happen with online transactions from a phone or browser, at offsite ATMs, even among staff. Without trust, banks won't have customers—or shareholders. Excessive fraud, and delays in detecting it, can violate financial industry regulations, cause insurance premiums to increase, invite closer scrutiny by regulatory agencies, and generate negative press. That means a loss of confidence by customers, investors, and the broad market.

The AI solution: Fraud detection can combine multiple AI technologies, including computer vision to interpret scanned documents; document verification to authenticate identification materials, such as driver's licenses or national ID cards; and machine learning (ML) to compare transaction information against a large model of known legitimate and fraudulent transactions.

Together, these technologies feed into an anomaly detection model that calculates the statistical risk of fraud in each attempted transaction within seconds. If the risk is too high, alerts trigger automated actions, such as to place a hold on withdrawals, prompt the customer to provide additional forms of identification, or otherwise temporarily delay the transaction pending a manual review by a risk assessment specialist.

Consider a request to open a credit card. The applicant might be using a real credit score, address, identification, and other personal information; or it may be fraudulent, gained via identity theft. The AI system could detect anomalies based on factors a human may not notice, such as an ID with a slightly different physical or email address than the application, or an ID that is a photograph of an ID scanned by a mobile device instead of the genuine item.

The result: Fraud detection that is fast and reliable, with minimal false positives or negatives. AI-enabled, automated triggers and explanations can facilitate a rapid, manual risk-assessment review within the timeframes needed to satisfy government banking regulations, without inconveniencing honest customers.

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3 Health sciences

Pharmaceutical research

Customer: A biotech firm looking to find effective new treatments faster and more cost-effectively.

The problem: Researchers at biotech companies must integrate a tremendous quantity of information such as prior research at their firms, papers in peer-reviewed journals, academic work still in progress, formal clinical trials, patent applications, and more. Having a full grasp of prior work can suggest new approaches to solving problems while saving the time and cost of inadvertently trying something that's already failed. Anything that can help the researcher find and interpret relevant information will speed the process, helping bring new medications and medical devices to market more quickly.



The AI solution: A huge amount of information is already in digital form: online journals, patents, and clinical trial data. Much of that information is structured in a database or a spreadsheet. Other data sources, such as journal articles, are formatted as complex documents, often with a detailed layout and embedded diagrams. AI document understanding, as well as image processing and even language translation, can work with generative AI to summarize those papers, extract relevant information, and determine relevance to a particular project. The documents can also be collected into a large data model that can be studied and mined for insights.

The work doesn't stop when a relevant paper, diagram, database, or other information is found. Generative AI can work with the researcher to find the specific information, summarize it, and even interactively create a contextual representation of how that outside data relates to the researcher's current work.

The benefit goes beyond the obvious productivity boost for the researcher. Given the vast quantities of pharmaceutical data available, it would be easy to overlook relevant information that might result in breakthroughs or warn of potential areas of concern, such as side effects. Given the extreme cost of this research and the time-consuming nature of reviewing prior material, AI assistance can be a game changer—and a lifesaver.

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Three critical industries use cases

Communities and governments rely on municipal and private-sector organizations to deliver essential services to people, businesses, institutions, and the community. AI can proactively assist with many of the tasks required to maintain a state of readiness.

1 Utilities Predictive maintenance

Customer: An electricity grid operator with a service area of thousands of square miles.

The problem: The operator owns a vast array of equipment—pylons and substations, long-distance transmission lines, underground cables, poles, and transformers. Preventive maintenance on this equipment is both necessary and complex, and it must happen according to the manufacturers' schedules as well as when individual devices show signs of trouble. The objective is to perform maintenance as cost-effectively as possible, reducing travel time and making use of technicians' skill sets and availability while meeting service uptime delivery requirements.



The AI solution: With AI, data informs decisions about regularly scheduled maintenance and prompts staff to preemptively dispatch a crew when a system appears likely to fail. Relational databases and geographic information systems (GISs) store each device's location, maintenance and trouble history, and recommended service intervals. Drone imagery can capture trouble points on remote power pylons and help avoid the risk of fire by assessing whether vegetation in the right of way needs clearing. Meanwhile, sensors in transformers and other devices can broadcast data points, including operating temperature, power fluctuations, and other telemetry. This logged information and timestamped telemetry can be fed into an AI system that determines a baseline for normal operations during various seasons, weather conditions, and grid utilization.

The algorithms can then not only detect anomalies based on real-time data from devices but determine severity: Is it a case of “check this out next time a crew is in the area” or a “prepare to reroute power while dispatching a team” situation? The forecasting software can make recommendations while also showing the justifying data. It can also maximize field crew efficiency by identifying proactive maintenance that can be performed while workers are fixing nearby equipment.

With intelligent scheduling, anomaly detection, and forecasting based on past data, the utility can anticipate failures and get early warnings of potential issues, which ensures equipment uptime and helps manage maintenance costs.

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2 Manufacturing

Visual quality inspection

Customer: A factory that makes metal parts and other products used in shipbuilding, construction, and other applications.

The problem: Many manufacturers work under strict requirements and quality controls, often due to industry regulations and/or contract terms. As a result, these factories use both visual inspections and electronic means to monitor product quality. A part that fails to meet the requirements may be reworked or repurposed, or it may need to be scrapped. The factory seeks to maximize profits and throughput by shipping as much good material as possible while minimizing waste by detecting and handling defects early.

The AI solution: Factories generate a great deal of data about how each product was created, including furnace temperatures and the quantity of metals and gases used for each stage in the manufacturing process, which can be compared against requirements as well as best practices.

In addition, the quality assurance process creates X-ray images. This data can be interpreted by computer vision, which can learn to identify cracks and other weak spots after being trained on a large data set. Such defects can be categorized based on their size, shape, and quantity. In addition, problematic or ambiguous data can be highlighted for human inspectors, who will be the final arbiters of the QA inspection.

In this way, machine learning based on large data models, real-time telemetry, and computer vision can assist with analyzing data and make recommendations for approving or repurposing each product. For example, a beam that's not sufficient to hold 100 tons for one application can be certified to hold 10 tons for a different application. It might be sold for a lower price, but that's better than scrapping it entirely.

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3 Defense

Identification document analysis

Customer: A government site requiring tight access control.

The problem: Security personnel at a minimum-security defense installation need to quickly determine which individuals should be granted access, often using documents, such as passports, national ID cards, or (in the United States) a driver's license. These documents come in a wide range of sizes, shapes, designs, and with unique authenticity markings making it difficult for security staff to spot fakes. It can also be challenging to automate the process of extracting information from those IDs to check against databases and record in visitor logs.

The AI solution: Checkpoint scanners can quickly submit ID cards into a large AI model that has been trained to not only recognize various types of identification documents, but to check them against both implicit security controls and a large sample of forged or otherwise fraudulent documents, making it possible to determine which documents are legitimate with a high degree of confidence.

Beyond the appearance of the ID itself, document-understanding algorithms can parse and extract data, even when that data is unlabeled. For example, a field may be written in many forms, some numeric, some alphanumeric; an ID with several items that appear to be dates may have an issue date, an expiration date, and the individual's date of birth—none of which are clearly labeled. Names, addresses, and other information may also require interpretation by an AI algorithm trained with a large data set.

Once data has been extracted from the ID, and a fraud determination reached, the AI system assisted by algorithmic prompts can compare that individual against those who are explicitly authorized to enter the facility; those who may have implicit authorization, such as contract employees; and those who should be deferred for a closer screening.

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Why AI technology from Oracle?

Oracle AI is a family of accelerated infrastructure, artificial intelligence, and machine learning services. For AI training and inferencing, Oracle's AI infrastructure offers ultralow latencies for standalone graphics processing units (GPUs) and clusters with thousands of nodes. Using AI services, developers can add prebuilt models to applications and operations. With ML services, data scientists can build, train, and deploy models with their favorite open source frameworks or benefit from the speed of in-database machine learning.

A graphic consisting of two overlapping, rounded shapes in shades of green, with a dotted pattern on the left side. The text "AI services" is written in a bold, dark green font across the shapes.

AI services

With OCI AI services, developers can custom-train models, deploy ready-made ML models, and enhance applications and solutions with AI capabilities, without needing to be machine learning experts. Oracle AI comes with advanced models that are pretrained on business data, which can be customized by domain and customer data. They include



Oracle Digital Assistant: Conversational experiences for employees and customers through text, chat, and voice interfaces.



OCI Language: Prebuilt models trained on industry data that perform sophisticated text analysis at scale.



OCI Speech: Turns recorded audio conversations into textual data across multiple languages.



OCI Vision: Visual and text technologies to understand scanned documents, PDFs, video stills, and photographs.



OCI Document Understanding: Extract text, tables, and other key data from document files through APIs and command-line interface tools.



Machine learning services

Oracle's machine learning services, geared toward data scientists, make it easier to build, train, deploy, and manage custom machine learning models. These services deliver data science capabilities with support from favorite open source frameworks or through in-database machine learning and direct access to cleansed data.



OCI Data Science: A managed, end-to-end environment for building, deploying, and managing machine learning models.



Machine Learning in Oracle Database: A complete data science environment that's optimized for performance in Oracle Autonomous Database or Data Warehouse.



OCI Data Labeling: A service for building labeled data sets to train AI and ML models more accurately. It applies labels to text or images and then uses those labels to customize models and build shared catalogs.



AI infrastructure

Oracle Cloud Infrastructure (OCI) Supercluster: Provides ultrafast cluster networking, HPC, storage, and OCI Compute bare metal instances. OCI Supercluster is ideal for training generative AI, including conversational applications and diffusion models. With support for up to tens of thousands of NVIDIA GPUs, OCI Compute bare metal instances and VMs can power applications for computer vision, natural language processing, recommendation systems, and more.

The future is at hand

The AI use cases shown in this book represent the tip of the iceberg, as excellent applications for these technologies can be applied throughout specific industries such as financial services or manufacturing, and across common areas such as human resources and customer services.

Use the examples presented here to spark your own conversations, and see where your organization can leverage the benefits from today's AI technologies to help prepare for a more successful future.

We suggest the following Oracle resources to help guide you in this journey: Artificial Intelligence on OCI and Generative AI with Oracle.

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