Microsoft Azure

Nine AI Trends Driving App Innovation

Unlock competitive advantage by migrating
and modernizing your apps to the cloud

This e-book is for you if...

You're a technology decision maker who owns the digital experience at your business, considering how to use cloud AI services to develop or modernize new apps.

You want the competitive advantage that comes from using emerging AI technologies in app development to drive operational efficiencies and improve customer experiences.

You're a business decision maker evaluating your business's app strategy.

Get up to speed on 9 app trends in under 15 minutes.

Contents

The time to innovate with AI is now

The question is—how?

Since ChatGPT burst into public consciousness, businesses have been eager to join the AI movement and adopt generative AI. According to a Gartner, Inc. poll, 45% of executive leaders have increased their AI investments directly due to the publicity surrounding ChatGPT.[1]

Many of today's software and technology companies see immense potential in using AI to develop applications that personalize customer journeys, boost satisfaction, and increase usage. Moreover, they see an expanding body of tools that make it easier for their developers to build and ship these AI-powered applications quickly and securely.

Generative AI isn't the only groundbreaking trend in the world of AI. The modern landscape is full of AI tools that inspire intelligent app development in product optimization, customer support, security and maintenance, and dozens of other applications. Software companies are in a race to determine what kinds of AI will be most impactful in helping them build and modernize apps that support a new set of demands for speed, efficiency, and personalization.

With new trends in AI, machine learning, and analytics emerging every year, knowing what holds the greatest potential for your company is essential. This e-book helps jump-start your intelligent app strategy by exploring nine of today's most significant AI trends.

What makes an app "intelligent"?

An intelligent app uses AI, machine learning, advanced analytics, and cloud-scale data to create smarter and more intuitive interactions than a traditional app. Currently, businesses across industries are working to develop intelligent apps that drive efficiency, save time, and create game-changing customer experiences.

Modern apps integrate AI and advanced technologies to provide benefits to customers, employees, and businesses.

Customer benefits

→ Interact with businesses in an intuitive, human-like manner with purpose-built virtual assistants or chatbots capable of understanding language, context, and user intent.

→ Get personalized experiences based on historical and real-time interactions.

→ Receive around-the-clock assistance and support across different channels and devices.

Employee benefits

→ Gain access to more advanced capabilities like coding, imaging, and analytics, even for non-technical employees.

→ Simplify data ingestion for use in AI engines and easily integrate structured, unstructured, and real-time data.

→ Eliminate redundant tasks to allow more space for creative and strategic tasks.

→ Receive on-the-job personalized assistance for complex tasks.

Business benefits

→ Go to market faster with enhanced personalized and unique digital experiences.

→ Build scalable apps that handle large volumes of users without sacrificing performance.

→ Enhance your understanding of customers and their needs.

→ Improve decision-making to mitigate risk and keep pace with emerging trends.

Chapter 1

Nine AI trends to power app innovation

AI is making app development easier and apps more flexible. Teams don't need a dedicated developer to create customized solutions. From chatbots to enhanced security to reimagined workflows, here are the technologies driving the intelligent app renaissance.

Trend 1: Low-code/no-code development

Make AI development accessible to non-technical users

Low-code and no-code technology is an AI trend that helps users build apps, websites, and workflows without coding experience. Using drag-and-drop capabilities and point-and-click interfaces, low-code/no-code tools automate and streamline the development phase of a project, making it easier to build apps without needing extensive IT skills. Plus, low-code/no-code platforms typically adapt to the user's preferences, style, and feedback, while autocomplete features provide coding suggestions to increase developer efficiency and productivity.

This kind of technology is transformative for companies with teams that need to develop solutions constantly and quickly. For instance, a business might create a no-code app that churns out AI-powered workflows in minutes to keep projects moving forward.

Benefits of low-code/no-code development

→ Save time and money by eliminating the need for manual coding, configuration, and testing.

→ Empower developers to build and scale intelligent apps faster, more efficiently, and effortlessly.

→ Reduce the development bottleneck during project lifecycles to accelerate time-to-market.

Intelligent app innovation example: Build an AI agent that improves customer services

Low-code/no-code development could be used to create an AI agent for customer service agents. The developers would describe in natural language what they want the agent to do (for instance, providing real-time coaching and feedback to improve agent performance) and the no-code development tool would generate the code, formulas, and components required to build it in a fraction of the time it would take manually.

Trend 2: Conversational AI

Create natural and engaging interactions between humans and machines

Conversational AI simulates human conversation to make interactions more engaging and realistic. Using natural language processing and machine learning to understand and generate natural language responses, apps enabled with conversational AI allow users to communicate via text or voice as they would with another person.

Conversational AI powers human-like interactions for various intelligent apps—a chatbot that helps banking customers find their routing number, a translation app that enables real-time communications during multilingual videoconferencing, and a medical transcription companion that cuts administrative overhead nearly 50%.

Benefits of conversational AI

→ Reduce costs and increase productivity by automating tasks that humans currently perform, such as answering common questions, scheduling appointments, and making product recommendations.

→ Deliver better customer experience by providing personalized support anytime, resolving issues faster, and offering additional information and suggestions.

→ Collect and analyze data from interactions to improve performance over time, learn preferences, and provide insights for business decisions.

Intelligent app innovation example: Create a conversational AI app to generate and qualify leads

Conversational AI can help businesses generate and qualify leads through websites, social media, or email. For instance, you could create a conversational AI app that engages with potential customers on their channel of choice. Asking relevant questions and providing the necessary information in a knowledgeable, human-like tone, the app autonomously moves prospects to the next logical step in their journey, providing a personalized experience while freeing team members up for other tasks.

Trend 3: Generative AI

Create novel content based on existing data

Generative AI is a type of AI that can create new content, such as text, images, or code, by training on existing data. It uses deep learning and neural networks to analyze the patterns and structure of the input data and then generate new content with similar characteristics.

Today, generative AI powers various intelligent app experiences involving text, voice, code, and images. For instance, it could power a faster, smarter, natural language search feature, a medical app that generates images showing the future progression of a disease, or an AI assistant that surfaces insights from a company's sites to speed up research. Generative AI is also used to create synthetic data, which helps enhance existing datasets and anonymize sensitive information.

Benefits of generative AI

→ Quickly produce novel content like summaries and emails, freeing employees for more critical tasks.

→ Increase cost savings resulting from improved productivity and enhanced customer support interactions.

→ Provide knowledgeable customer support anytime, resolving issues faster and offering personalized information and suggestions.

Intelligent app innovation example: Generate synthetic data to protect patient confidentiality

A healthcare organization could develop an intelligent app for medical research that uses generative AI to create synthetic data from information found in patient records, medical images, and lab results. This application of AI helps preserve the statistical properties and relationships of patient data while ensuring sensitive information remains confidential. This way, the app can protect patient privacy while providing large and diverse datasets for better research.

Trend 4: Predictive analytics

Forecast future outcomes and performance based on historical data and statistical models

Predictive analytics involves using data to foresee future events so leaders can plan and strategize accurately. It employs data analysis, machine learning, AI, and statistical modeling to detect patterns that indicate future behaviors and outcomes. The process involves quickly ingesting and using past and present data and then using different methods to spot trends, connections, and unusual patterns.

With these capabilities, predictive models can be used to build intelligent apps that gauge the likelihood of specific events or results and suggest next actions. For example, a manufacturing company might build a smart app with predictive analytics to monitor machine performance and predict when maintenance is needed before potential issues cause downtime. In the medical field, a company might use predictive analytics to innovate an app that analyzes medical records to predict health outcomes and prescribe possible treatments.

Benefits of predictive analytics

→ Find new revenue opportunities based on current and historical trends and customer behavior.

→ Enhance supply chain management by providing a snapshot of future demand and inventory levels.

→ Improve risk management by identifying and mitigating potential threats.

Intelligent app innovation example: A CRM app that predicts customer churn

There are usually signs indicating that a customer is about to churn—but they often go unnoticed until it's too late. Predictive analytics can be used to build CRM apps that segment customers, predict their behavior, and personalize their interactions based on past behavior. This app could help identify which customers are most likely to churn and automatically offer incentives or discounts to convince them to stay.

Trend 5: Cybersecurity

Protect data, networks, and systems from cyberattacks

AI is becoming increasingly essential in cybersecurity, safeguarding online systems against cybercriminal attacks and preventing unauthorized access. Using data mining, machine learning, and natural language processing, it helps monitor and analyze behavior patterns to detect real-time cyber threats. AI also enhances user identity and access management by analyzing login attempts using biometrics, multifactor authentication, and behavioral data.

These capabilities are helpful for clients in the finance, insurance, e-commerce, and healthcare industries. For instance, if your company serves financial institutions, you might create an AI-powered fraud detection app that monitors user behavior to spot fake identities. In an e-commerce setting, an intelligent app could use machine learning to analyze transaction history to flag suspicious behavior and prevent fraudulent activities in real-time.

Benefits of AI in cybersecurity

→ Reduce costs and increase productivity by automating system monitoring, threat detection, and incident response tasks.

→ Reduce human error from security processes.

→ Process huge amounts of data to automatically detect emerging threats that might go undetected with traditional cybersecurity systems.

Intelligent app innovation example: AI-based identity verification and authentication

Traditional verification and authentication methods like passwords and security questions are becoming increasingly vulnerable to cyberattacks. In response, cybersecurity apps that integrate AI can help keep identities secure and prevent unauthorized access. These apps use AI and machine learning to analyze and evaluate user behavior and context such as device, location, and network to determine the risk associated with a user's activities.

Trend 6: Hyperautomation

Speed up workflows by automating as many processes as possible

AI hyperautomation involves automating everything in a business that can be automated, reducing the pressure on workers and freeing them up for other business-critical or high-impact activities. It employs AI, machine learning, robotic process automation, and other technologies to run processes and tasks without human intervention.

AI hyperautomation collects and analyzes data from various sources like sensors, databases, or user inputs with greater accuracy and speed than a human could. This makes hyperautomation a great tool for intelligent apps that handle large and complex datasets. For instance, a company might build an intelligent app to automate manual processes like time sheets and workflows.

Benefits of AI hyperautomation

→ Increase employee productivity and reduce human error by automating time-consuming tasks that are prone to mistakes.

→ Enable greater software development agility so developers can build and ship solutions to market faster.

→ Discover ways to optimize development workflows so processes are faster and more cost-efficient.

Intelligent app innovation example: An AI-powered app that eliminates manual invoice processing

Invoice processing is a key business task involving receipt, validation, and payment of supplier invoices. When performed manually, it's also slow, costly, and prone to errors. Using robotic process automation, an intelligent app could use hyperautomation to gather and extract data from various sources, including emails, scanned documents, or web portals, without human intervention. Then, it automatically validates the invoice data by checking for duplication, fraud, or compliance, eliminating hours or days of tedious work.

Trend 7: AI simulation

Create and test virtual models of real-world systems or phenomena

AI simulation involves using AI to create realistic models of physical systems in the virtual world. By mimicking the behavior and outcomes of real-world scenarios using data analysis, machine learning, and statistical methods, AI simulation lets users virtually explore different configurations, models, and material components before applying them to the real world.

The process begins with data collection from various sources, which is then used to train a machine-learning model. Once trained, the AI model can simulate real-world scenarios, predict outcomes, and provide insights for the next iteration. In the pharmaceutical industry, this technology is used in intelligent apps to design novel molecules for new medicines. In the energy sector, it powers solutions that use drilling data and geological factors to simulate well and reservoir behavior.

Benefits of AI simulation

→ Analyze complex datasets and scenarios to anticipate potential challenges and opportunities better.

→ Predict and model various risk scenarios, enabling you to prepare for and mitigate potential risks.

→ Streamline processes and reduce the need for physical prototypes for significant cost savings and increased efficiency.

Intelligent app innovation example: An AI simulation app that optimizes supply chains

Using an AI simulation app, businesses could optimize their supply chain operations by virtually modeling their products' demand, supply, inventory, logistics, and distribution. It could also help evaluate the potential impact of market changes, customer behavior, weather conditions, or geopolitical disruptions on their supply chain performance. AI simulation apps make it possible to explore different scenarios so businesses can see how using other suppliers, routes, or modes of transportation would help or hurt their supply chains or impact customer satisfaction.

Trend 8: Search and recommendation

Personalize user journeys with content and products relevant to their needs

AI search and recommendation apps rely on machine learning algorithms to examine user data and forecast preferences. They gather data, capture user preferences, and scrutinize the amassed data to detect patterns, preferences, and behaviors, helping to discern what users might appreciate or find valuable. Then, the system employs filtering algorithms, ranging from simple rule-based filters to sophisticated neural networks that evolve with each interaction, to recommend items most relevant to the user's interests.

These AI-driven systems play a crucial role in various digital platforms, enriching user experience by tailoring content, products, and services to match individual preferences. For example, a software company might develop a more transparent and accountable personalized reporting system, or an e-commerce app that suggests products based on their browsing and purchasing history and behavior.

> **Benefits of AI search and recommendation**
>
> → Offer personalized experiences by suggesting content, products, or services that match individual user preferences.
>
> → Encourage users to interact more with the platform by suggesting relevant items and content, leading to greater time spent and user satisfaction.
>
> → Achieve higher conversion rates as users are more likely to find and purchase products that meet their needs.

Intelligent app innovation example: An app that personalizes travel experiences

Imagine an AI-powered travel companion app that curates bespoke travel itineraries. Analyzing past trips, preferences, and even social media activity, it crafts unique travel experiences tailored to an individual traveler's tastes. Whether they're seeking adventure, relaxation, or cultural immersion, the app could use AI-powered search and recommendation algorithms to suggest destinations, accommodations, and activities that resonate with the individual's travel style. It could pull data from the traveler's feedback on past experiences, refining future recommendations to ensure each journey is more personalized than the last.

Trend 9: Data grounding

Enhance the accuracy and relevance of AI-generated content

Sometimes, large language models produce responses that seem factual on the surface but are untrue. These are called hallucinations, and they can drive down the trust of an AI system. AI data grounding helps eliminate hallucinations and improve the accuracy of AI apps by linking abstract knowledge in AI systems to concrete, real-life examples. Data grounding works by gathering and analyzing data from both internal datasets and external sources like sensors, networks, databases, and human feedback to help verify what is factual before generating output.

Data grounding helps build intelligent apps that produce contextually relevant results. Microsoft Copilot AI uses data grounding to provide additional context to its web page searches, which allows it to answer queries with cited sources. Data grounding could also be used in a large language model to give driving directions based on external information like road closures, traffic conditions, and electric charging points.

Benefits of AI data grounding

→ Minimize the chances of generating incorrect or fabricated information.

→ Facilitate fact-checking by allowing users to check and verify the sources from which the data was retrieved.

→ Continuously improve performance and learning by collecting and analyzing data from the generated content to improve its accuracy, adaptability, and usefulness.

Intelligent app innovation example: An AI app for sales, marketing, and finance reporting

AI report generation creates informative and persuasive reports for business purposes, including sales, marketing, and finance. Using a tool like ChatGPT, a company could generate reports based on internal data. Then, to help ensure the report is credible, the AI tool could ground its outputs with data from reliable external sources and incorporate them into the report content, providing citations and references to give the reader confidence that what they see is accurate.

Chapter 2

A path to AI: Migrate and modernize your apps with Azure

If you're struggling to fully adopt AI technologies, your existing app infrastructure might be what's holding you back. On-premises apps that leverage cloud native services create a fragmented app landscape.

With Azure, you can modernize or even fully migrate your apps. You will gain cloud and AI benefits that help you innovate securely, create better customer experiences, gain flexibility, and drive efficiency.

Build and modernize with Azure to sharpen your competitive edge

A commissioned study by Forrester found that using the Azure solutions stack approach resulted in significant benefits for fast, efficient app development.

→ Up to **1.5 months faster** time-to-market for new applications[2]

→ Up to **25% reduced** app downtime[2]

→ Up to **25% increased** developer efficiency[2]

[2]The Total Economic Impact™ of Microsoft Azure App Innovation, a commissioned study by Forrester Consulting on behalf of Microsoft, June 2023. Results are from a composite organization based on interview customers.

Azure solutions form a stack of integrated tools that make creating intelligent apps fast, intuitive, and cost-efficient. For example, take CallRevu, a company that helps auto dealerships improve lead conversion, follow-up, and the customer experience. They found that as demand grew, they needed faster, scalable ways to analyze calls, surface insights, connect marketing to results, and support teams across **5,000+** locations.

To meet this need, CallRevu built an AI solution with Azure OpenAI In Foundry Models for summaries and training, Azure Kubernetes Service to manage models, and Azure SQL Managed Instance with Microsoft Fabric and Power BI to deliver real-time insights on follow-up, performance, and ROI.

Dealerships using CallRevu's platform achieved:

| **15%** lift in lead conversion | **20%** fewer missed opportunities | **10%** higher customer satisfaction | CallRevu estimates the automation saves up to **$500,000** annually in labor costs across all dealerships using its platform. |

Azure solutions for building and modernizing apps with AI

→ **Azure Kubernetes Service (AKS)** is a managed service that allows you to run Kubernetes clusters in Azure without worrying about the operational overhead of managing them. Use AKS to deploy and scale containerized applications, integrate Azure services, and use Kubernetes features and tools.

→ **Azure SQL DB** is a fully managed cloud database for handling database management functions, including patching, backups, and security, with minimal user configuration and control.

→ **Azure App Service** is an HTTP-based service hosting web applications on Windows and Linux-based environments. Develop in your preferred language, including .NET, .NET Core, Java, Node.js, PHP, and Python.

→ **Foundry Tools** gives customers advanced language AI with OpenAI GPT-4, GPT-3, Codex, DALL-E, and Whisper models with the security of Azure. Azure OpenAI co-develops the APIs with OpenAI, ensuring compatibility and a smooth transition from one to the other.

→ **Azure Cosmos DB** is a fully managed NoSQL and relational database that supports various data models, including relational, document, vector, key-value, and graph. It offers guaranteed speed, scalability, availability, security, and integration with Foundry Tools and Azure Synapse Analytics.

→ **Azure DB for PostgreSQL** is a relational database service based on the open-source Postgres database engine. It's a fully managed database-as-a-service that can handle mission-critical workloads with predictable performance, security, high availability, and dynamic scalability.

→ **Microsoft Fabric** combines the power of the cloud and Microsoft data and analytics tools to help you streamline your data-intensive workflows. Simplify data ingestion and easily prepare data for use in AI engines.

→ **GitHub Enterprise** supports collaborative development in the cloud, combining code versioning with built-in DevOps, end-to-end security, and integrated open-source practices via innersource.

→ **Azure Machine Learning** is a machine learning as a service platform that empowers developers to build, deploy, and manage models faster in the cloud. This enables software developers to use machine learning for app development and integrate machine learning and AI into applications.

→ **Azure Document Intelligence in Foundry Tools** streamlines knowledge base management with customizable models to extract information from your documents, turning them into usable data.

→ **Microsoft Foundry** allows you to use and train AI models using your own data, supporting scalable innovation with custom generative AI programs and agents.

Take the next steps

Unlock more possibilities with pioneering generative AI, developer tools that help you innovate faster, and a partner committed to your success.

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