

Four AI Trends Driving App Innovation

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Introduction

Generative AI presents many exciting opportunities for businesses seeking to innovate and differentiate themselves in today's competitive landscape. From generating personalized content for marketing campaigns to automating repetitive tasks and enabling rapid research, businesses across industries increasingly see the potential of generative AI to revolutionize their workflows and offerings.

The interest in generative AI drives enterprises to consider their applications and capabilities. They're looking for ways to use AI to create intelligent experiences for both employees and customers. Whether your organization is looking to build human-like AI customer service bots, speed up development with code generation, or use generative AI for any of the other multitudes of use cases, the possibilities for improving internal and external experiences with intelligent apps are vast.

The conversation around AI trends is constantly changing. In this e-book, we'll explore the top four AI trends that are dominating strategies and conversations today and provide an actionable framework for meeting your intelligent app goals.

What is an intelligent app?

An intelligent app uses advanced capabilities including natural language processing (NLP), computer vision, speech recognition, machine learning, and generative AI to provide more intelligent and responsive experiences. Using AI to automate and enhance certain aspects of the app's functionality enables greater personalization, drives efficiency, and creates game-changing customer experiences.



AI conversations today:

Comparing models and enabling customization

For visionary leaders responsible for their organization's digital experiences, keeping up with the latest developments in AI is important to understand where the greatest opportunities lie. As more options enter the market, leaders want to know how to select models that can be tailored to their unique needs while providing the best balance between performance and cost-effectiveness.

Know and evaluate your options

Organizations looking to implement AI apps have several options. For instance, they can pursue custom AI models for tailored solutions or use pre-built model as a service (MaaS) offerings for ready-made implementations. To know which option is best for their needs, teams need the ability to evaluate different models. Tooling provides comprehensive frameworks and resources for evaluating different models.

Using benchmarking, performance metrics analysis, and visualization capabilities, tooling helps you compare key metrics like accuracy, speed, resource utilization, and scalability across different models so you can ensure you're making the best selection, and not settling for something that only meets some of your needs.

Customize for your unique needs

Model customization is also at the top of many teams' minds, with techniques like fine-tuning offering ways to tailor AI models to specific requirements and skill levels.

Retrieval augmented generation (RAG) represents a major advancement in natural language processing, enabling the generation of more nuanced responses that can turn vast data repositories into meaningful interactions and solutions.

RAG can enhance the understanding of small differences in language, allowing for the development of AI applications that can interpret and respond to complex queries with exceptional accuracy and relevance.

Hybrid search is a common practice in optimizing the retrieval step, allowing for keyword-based searches with vector-based approaches. By integrating both methodologies, hybrid search lets users find exact keyword matches and conceptually similar content with a single query, enhancing information discoverability and creating a more intuitive search experience for users.

Data preparation is another key consideration for customization. To gain truly comprehensive insights, many teams need the ability to ground their models in diverse data types like video and imagery, along with textual data. From there, they can build AI apps that analyze and understand content across multiple data formats, providing a holistic view that drives more informed decision-making.

Customizing the responses in generative AI apps

RAG: Combining information retrieval with text, image, and other types of generation, RAG allows enterprises to generate responses grounded on their data, ensuring the most relevant output.

Prompt engineering: Helping to bridge the gap between queries and responses, prompt engineering involves creating clear, specific prompts that ensure LLMs can understand nuanced requests and generate context-aware output.

Fine-tuning: Pre-trained models sometimes need further training to make them useful for specific AI app use cases. Fine-tuning is the process of training models on smaller, more targeted data sets to improve their performance for specific tasks.

Top four AI trends to explore

Trend 1: Generative AI

Create novel content based on existing data

Generative AI has undergone significant changes in the past months alone, particularly in its move from being solely text-based to enabling multimodal experiences incorporating text, speech, images, and video. Adding these diverse data types as input mechanisms for generative AI applications helps expand app capabilities to be even more engaging, offering customers and employees enriched interactions and experiences with software.

This evolution is evident in advancements such as GPT-4o with integrated vision models, DALL-E 3, [Azure AI Vision](#), [Azure AI Search](#), and [Azure AI Speech](#), which enable generative AI to process and generate content across multiple modalities. Plus, innovations like RAG are making generative AI more practical by using customer data and enhancing search techniques beyond keyword searches, resulting in richer and higher-quality user experiences.

KPMG Australia created a generative AI chatbot that uses [Azure OpenAI Service](#) and [Azure Cosmos DB](#) to surface employee insights for the company's internal websites, knowledge repositories, and Microsoft 365 productivity files.



The results of our adoption of Azure Cosmos DB for MongoDB vCore were startling. Search quality jumped from 50% to 91%, and our results were being delivered in under a second."

Robert Finlayson, Senior Product Manager,
KPMG Australia

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Today, generative AI fuels a new era of intelligent app development, providing new ways to use text, voice, code, video, and images to power engaging and personalized experiences. For instance, a manufacturing company could create an AI app that improves quality control by using video analysis to detect anomalies or defects in products. It could also power an app that summarizes complex financial documents, 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.

Benefits of generative AI

Free employees for critical tasks → Automate repetitive tasks to give team members more time to handle high-priority tasks.

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

Drive personalization at scale → 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, preserving the statistical properties and relationships of patient data. In this way, the app would help protect patient privacy while providing large and diverse datasets for better research.

Trend 2: 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 gathering and analyzing 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 an intelligent 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.

Intelligent app innovation example: An app that predicts student success rates

To improve student retention, a university could build an intelligent app that uses predictive analytics to identify at-risk students and set them on a course for success. By using machine learning, the app would analyze data from student demographics, academic performance, and social factors to identify patterns and indicators that a student is at risk of dropping out. It would assign a risk score to each student, and then generate personalized intervention strategies, targeting students in need of support before they encounter critical challenges.

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 with real-time visibility to identify and mitigate potential threats and enable remote monitoring of devices, people, and assets.



Sapiens uses [Azure Kubernetes Service](#) and Azure-managed databases and Azure-managed databases—including [Azure Cosmos DB](#), [Azure SQL Managed Instance](#), [Azure SQL](#), and [Azure Database for PostgreSQL](#)—to enhance its data management and analytics capabilities. It also takes advantage of Azure OpenAI Service to speed up development times for AI solutions, reducing development costs.

“

With Azure OpenAI, we're developing and supporting automated solutions that improve the accuracy and speed of processes like underwriting, claims processing, fraud detection, and creating chatbots for supreme customer service.”

Alex Zukerman, Chief Strategy Office, Sapiens

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Trend 3: Cybersecurity

Protect data, networks, and systems from cyberattacks

AI is becoming increasingly essential in cybersecurity for safeguarding online systems against attacks by cyber criminals 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 useful in finance, insurance, e-commerce, and healthcare industries. For instance, a bank might build 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.

Anti-money laundering (ALM) risk management technology provider Kinectify uses [Azure Cosmos DB](#), [Azure AI Services](#), [Azure OpenAI Service](#), and [Azure Kubernetes Service](#) to identify transaction anomalies that could indicate money laundering and track evolving criminal tactics.

“

We've detected 43% more suspicious activities and achieved 96% faster decisioning with our Azure-based platform.”

Michael Calvin, Chief Technical Officer, Kinectify

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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 4: 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 actually untrue. When LLMs are well-grounded in diverse data sources and enhanced with retrieval techniques, they provide users with more accurate, relevant, and contextual interactions. AI data grounding helps improve the accuracy of AI apps by linking abstract knowledge in AI systems to concrete, real-life examples. By gathering and analyzing data from both internal datasets and external sources like sensors, networks, databases, and human feedback, grounding helps verify what is factual before generating output.

Grounding models in your organization's data is a critical capability. Anyone can use data from the internet, but only your organization has the unique insights it needs to build AI solutions specifically suited to your needs. Using internal data, AI models can be trained on domain-specific information and media-rich, multimodal data sources, improving accuracy and relevance in generating actionable insights or recommendations.

Data grounding helps build intelligent apps that produce contextually relevant results. Bing 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 detecting fraudulent insurance claims

To prevent financial loss from fraudulent claims, an auto insurance company could build an intelligent app to help detect fake claims. Detecting fraudulent claims is typically challenging due to the large volume of data and the complexity of analyzing evidence from different modalities. This app would integrate and analyze images, text, and tabular data using multimodal grounding to identify fraudulent behavior patterns.



Getting started

Developing an intelligent app strategy using Azure AI can help your business bring its AI vision to life and stay ahead of the curve.

With Microsoft Azure, your teams have an easier and more collaborative development process as they deliver intelligent apps quickly and securely. Azure offers a complete developer platform and user-friendly tools that have been optimized for building new AI apps and infusing AI into existing ones.

As the leading AI-ready app platform, Azure is constantly pushing the envelope of innovation. Using Azure AI app tools and services, your organization could adopt a more flexible AI strategy that allows you to implement the latest technologies and advancements, ensuring your apps can be brought to the next level of speed, convenience, and user satisfaction.

Ultimately, an intelligent app strategy is a cornerstone of modern business, empowering organizations to thrive in a competitive market by using technology to meet and exceed customer expectations. Azure helps you get there by providing industry-leading AI tools, services, and security, all on an integrated cloud platform that seamlessly unifies your data, analytics, and AI operations.

Empower your business for limitless innovation

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Find the AI tools and capabilities you need to bring your intelligent app strategy to life. [Explore the Azure AI portfolio](#) >

Learn how organizations use Azure AI tools and services to save on costs and drive developer productivity. [Read the report](#) >