Microsoft Azure

Using AI to Build Intelligent Apps that Delight Customers

How four global enterprises are using AI and cloud-scale data to deepen customer satisfaction

Contents

Introduction

Today, breakthroughs in AI and data are ushering in a new era of app innovation, empowering businesses to overcome their biggest challenges and inspire growth with intelligent apps and services. Using AI tools and data, companies are rapidly developing unique solutions and digital experiences that drive immediate business results, positioning themselves as industry leaders for the long term.

This eBook offers a comprehensive overview of how some successful businesses use AI and data to build intelligent apps that delight customers and deliver game-changing results.

Delighting customers with AI apps

Consider a personal finance app that lets you track your spending habits and offers personalised financial advice based on past transactions and savings goals. Now, consider that same app using AI to automate simple banking tasks, providing intelligent recommendations on budgeting and spending.

Intelligent apps like the one described above provide an experience uniquely tailored to the customer. Not only do they provide a wonderful experience, but they also give the customer real value that they wouldn't find elsewhere.

AI apps delight customers in ways that we're just beginning to explore. Whereas traditional apps have built-in limitations, AI apps employ machine learning to continually learn and adapt, using advanced models powered by cloud computing to optimise their results over time. The insights they provide are much more informative and actionable than their non-AI counterparts.

Here's a simple breakdown of the core differences that make intelligent apps more flexible, scalable and high-performing than traditional apps.

	Traditional apps	Intelligent apps	Outcome
Learning and automation	Depends on the code written by the programmer to perform a specific task	Programmed to learn to perform the task by using data, algorithms, computation and method	Intelligent AI apps can adapt to changing situations and user preferences, while traditional apps are limited by predefined rules and logic
Responsiveness	Can only respond to user inputs or requests	Can anticipate user needs and offer suggestions or solutions	Intelligent AI apps are proactive, making them more personalised and engaging than reactive traditional apps
Data Capabilities	Designed only to handle certain types of data or inputs	Designed to handle various types of data or inputs and even generate new data or output	AI apps are flexible and creative, allowing users to engage beyond traditional app limitations in ways they didn't expect
Implementation	Typically built on a monolithic architecture and deployed on- premises	Built on the cloud using a microservices architecture	AI apps have enhanced scalability that lets them handle unlimited traffic and data

Building apps with AI may seem like a thing of the future – but it's not. In the following pages, find out how four companies fueled their intelligent app strategy using Azure AI tools.

Maximising team performance and collaboration

Strategy management consulting firm Arthur D. Little enhances collective intelligence

For almost 140 years, global strategy management consulting firm **Arthur D. Little** has been helping clients drive technology innovation to enhance their industry-leading capabilities. The firm's clients include the majority of the Fortune 500, and its workforce extends across 46 offices in 39 countries. Teams of consultants work with a giant and ever-growing wealth of data and documents – much of which is unsorted and unstructured.

With most of its intellectual capital being stored in complex data formats and multiple languages, traditional content search methods were proving to be unsustainable. The firm couldn't easily access the collective knowledge scattered across documents, files and experts. Already a Microsoft customer, Arthur D. Little turned to **Azure OpenAI Service**, **Azure AI Search** and **Azure AI services** to create and launch an internal AI solution to sort through and make sense of complex document formats so they could deliver better service to their clients.

> **Our cutting-edge use of Azure AI isn't just innovative, but groundbreaking. It represents our teams' immense effort and expertise, unlocking our collective intelligence to tackle our clients' most complex challenges."**
>
> **Ignacio Garcia Alves**
> Global Chief Executive Officer at Arthur D. Little

AI app innovation goals

Intellectual property knowledge management

Useful information was typically stored in complex data formats and multiple languages, making searching and interacting with relevant data difficult. The company wanted to make it easier to search through and summarise documents so they could spend more time delivering personalised service.

Trustworthy data handling

The company wanted a solution that would perform fast searches while maintaining the highest levels of confidentiality to comply with regulatory and contractual privacy requirements to preserve client trust.

Simplified infrastructure management and monitoring

The company wanted to innovate products and services using the most advanced technologies without getting bogged down in manual management processes.

> **Bringing our 137 years' worth of knowledge into a high-impact technology capability seemed impossible before. But layering multiple Azure AI elements and putting everything into one accessible solution has helped us understand and unlock the value of our intellectual capital across our various landscapes."**
>
> **Jon Nicholls**
> Chief Information Officer at Arthur D. Little

Through the power of pre-trained large language models, the team at Arthur D. Little were no longer simply searching, but building insights as they browsed their knowledge base. They were able to bring generative AI to businesses in a responsible, scalable, secure and compliant way.

Solutions used

To maximise the collective knowledge of its consultants, Arthur D. Little created an internal solution that draws on text analytics and other AI enrichment capabilities in Azure AI services to improve indexing and deliver consolidated data insights. Using this solution, consultants have access to summaries of documents with the **abstractive summarisation** feature in **Azure AI Language**. Unlike extractive summarisation – which only extracts sentences with relevant information – abstractive summarisation generates concise and coherent summaries, saving the consultants from scanning long documents for information.

- **Azure OpenAI Service**
- **Azure AI Search**
- **Azure AI service**

Outcomes

1. Enhanced summarisation capabilities speed up consultant workflows

The abstractive summarisation in Azure AI Language was transformational in helping consultants access information. For instance, it can take a 100-slide PowerPoint deck with fragmented text and images and immediately make them readable and searchable, allowing consultants to determine whether a document's content is relevant within seconds. Plus, introducing **text translation** and **entity linking** in Azure AI Language and an Azure SQL Server operational data mart helps consultants better understand the context and relationship of their data, breaking down previous knowledge barriers.

2. Improved security and confidentiality

Arthur D. Little became an early adopter of large language models through Azure OpenAI, which helped them store inputs and responses in a secure environment and ensure that confidential information wouldn't be used for training purposes. For heightened security, the company also deployed **Microsoft 365 Defender** and **Microsoft Intune** throughout the firm, giving it access to incident management abilities to quickly address any activity that appears beyond the baseline.

3. Rapid innovation for products and services

Arthur D. Little's infrastructure has been grounded in **Windows Server virtual machines on Azure**, allowing it to turn off any remaining VMware software from its on-premises environment. Across every use case, the firm makes each of its Azure services available to its development team without contacting Microsoft, so its teams can move straight into its innovation and development phase without dealing with manual infrastructure management and monitoring.

Read the full story >

Increasing flexibility and accessibility

TIM pioneers synthesised voice service to increase customer satisfaction

Italian-Brazilian company **TIM** was founded in 1995. Today it serves tens of millions of customers daily throughout Brazil, making it one of the largest organisations in the country in landline, mobile telephone and internet services.

The company's virtual assistant, named TAIS, is used to perform customer service. The telephone service was initially created with a robotic voice and some options. Over time, this was eventually replaced with scripted human speech recorded in a studio. Although the human-sounding voice was an improvement over the robotic one, the company still recognised that it lacked a quality of friendliness. After all, nobody communicates with a friend through a list of options. With support from Microsoft, TIM implemented a synthesised and realistic voice solution for AI-generated phone answering to give customers a more approachable method of solving their problems over the phone.

> **With the switch to the neural voice, we were able to measure, via surveys, an increase in customer satisfaction by approximately 30%."**
>
> **Olimpio Fernandes**
> Director of Cognitive Experience Center, TIM

AI app innovation goals

Accessibility and inclusion

With customers speaking a wide range of languages and needing different accommodations, TIM sought to provide a service in over 100 languages and give customers more ways to control the conversation. For instance, some customers might want to ask the voice to slow down to enhance their understanding – something the recorded voice couldn't do.

Increase the scope of communication options

The voice recorded in the studio made any type of improvisation impossible, limiting the scope of the conversation.. The company wanted a phone answering solution that would move away from a scripted bot, which is limited in its ability to address certain issues and doesn't allow for improvisation.

Enhance competitiveness on the global stage

The company's evolution was leading it to serve foreign audiences and sponsor major events. TIM wanted to increase its competitive standing in the industry by expanding its service capacity for international customers without requiring costly human contributions.

> **We made a courageous choice of investing in the use of a neural, synthesised voice when no one else was doing it. We talk to millions of customers each year, so changing our voice is an act of courage."**
>
> **Olimpio Fernandes**
> Director of Cognitive Experience Center, TIM

Solutions used

To increase its capacity to provide friendly phone service, TIM created a synthesised and realistic voice solution for AI-generated phone answering using AI tools from Azure. The company implemented Azure AI Services, Azure AI services, Azure AI Speech and Text-to-Speech Neural Voice to create the neural voice channel.

In response, TIM customers accepted the new speech with enthusiasm. They instantly noticed an increased quality in understanding and intonation. With their new phone answering tool, TIM customers realised they could provide enhanced services to their own customers over the phone without demanding additional human effort.

- Azure AI Speech
- Azure AI services
- Text-to-Speech Neural Voice

Outcomes

1. Reduction in operational costs and human effort

With the switch to neural voice, TIM has helped its customers reduce the amount of human contribution needed to serve customers, which has directly influenced both customer satisfaction and cost savings. According to the **Forrester TEI of Azure AI study**, the adoption of Azure AI has the potential to result in 40% reduction in customer support requests.

2. Enhanced communication and understanding

Using the new tool, phone customers have access to more options to help them better understand and guide the conversation. They can request slower or faster speech, making it easier for companies to solve their customers' problems. This has enabled friendlier and more approachable phone service that was never possible with a scripted bot.

3. Improved global scalability and service options

The tool has expanded the company's service capacity for international organisations by offering a range of more than 400 different voices in 140 languages.

Read the full story >

Enabling opportunities to innovate

DeepBrain AI adds more advanced AI capabilities to its technology

Founded in 2016 as a chatbot service, DeepBrain AI has been on a mission to design AI solutions for customers in finance, commerce, retail, education and media. By 2018, DeepBrain AI developed an early prototype of its AI avatars. By 2019, it enabled voice synthesis capabilities for its solutions, and then continued pushing the envelope by innovating AI avatar capabilities.

In its never-ending quest to innovate with AI, the company turned to the Azure platform to take advantage of its large language model capabilities, among others. Now, the company has integrated Azure OpenAI Service, Azure Cognitive Services and AKS to power intelligent AI-charged avatars that customers use for training videos, news broadcasts, marketing videos, one-on-one interviews and more.

> **Choosing Azure wasn't just about utilising today's best AI services. The teams at Azure really made us feel like we were a valued partner."**
>
> **Michael Jung**
> Chief Financial Officer, DeepBrain AI

AI app innovation goals

Enhance scalability and efficiency

DeepBrain AI wanted to build and train sophisticated deep learning models on extensive datasets. This required technology that could easily scale AI workloads and dynamically allocate computing resources while ensuring high availability across all its applications.

Increase the scope of communication options

With vast amounts of data to analyze to power its expanding portfolio of AI solutions, the company wanted more tools for eliminating manual processes and cutting down on development time. This would help them iterate quickly and save time and effort in managing infrastructure.

Enhance competitiveness on the global stage

In addition to adding more advanced AI capabilities to its solutions, DeepBrain AI wanted go-to-market support to help sell its solutions to a wide range of industries, including retail, customer service, finance and education.

> **Prior to developing large language models, we would have to manually update our chatbots and language services. Now, with the power of Azure OpenAI Service, we can cut down on development time and eliminate many manual processes."**
>
> **Michael Jung**
> Chief Financial Officer, DeepBrain AI

Solutions used

Partnering with Azure has helped DeepBrain AI expand its AI solutions portfolio, including DeepBrain AI Avatar, DeepBrain AI Human and DeepBrain AI Interview. These solutions use the capabilities of Azure OpenAI Service, Azure AI services and Azure Kubernetes Service (AKS). Additionally, through the Azure Marketplace, DeepBrain AI is able to sell solutions globally – gaining a higher level of exposure than ever before. Lead generation coming through the Azure Marketplace has provided the company with a valuable revenue stream and helped get its product in front of the customers who need it the most.

- **Azure Kubernetes Service**
- **Azure OpenAI Service**
- **Azure AI services**

Outcomes

1. Enhanced ability to process and analyse massive amounts of data

AzureOpen AI Service and Azure AI services have helped DeepBrain AI build sophisticated deep learning models and train them on extensive datasets, leading to breakthroughs in natural language processing, computer vision and other AI domains. These solutions have been integrated into the DeepBrain AI portfolio of tools, including a photo-realistic AI avatar that serves as an AI retailer, AI banker, AI tutor and more.

2. Next-generation avatars have groundbreaking language understanding and translation capabilities

Using **Azure AI Speech capabilities**, DeepBrain AI develops state-of-the-art NLP models integrated directly into its AI infrastructure. This has helped the company maintain accurate, efficient NLP solutions that can be seamlessly integrated across a wide range of industries.

3. Improved scalability and efficiency deliver cost and time savings

AKS provides a managed container orchestration service that automates containerised application deployment, scaling and management. This helps the company easily scale AI workloads and shift computing resources to where they're needed most while providing high availability across all applications. The AKS functionality saves developers time and effort in managing infrastructure so they can bring innovative solutions to market faster.

Read the full story >

Allowing real-time scalability

Nederlandse Spoorwegen helps travellers take a less crowded route

Nederlandse Spoorwegen (NS), the Netherlands' principal passenger railway operator, serves around one million passengers daily, with nearly 60% of Dutch residents using the train at least occasionally. NS determined that the best way to influence passenger behavior was to give them information about train crowdedness.

The Dutch railway system produces vast amounts of data that the team could use as part of a customer-facing solution. NS saw how much data was flowing in and realised it needed to be on the public cloud. The company chose to build its new crowdedness indicator solution on Azure for its scaling capabilities so its system could dynamically scale to accommodate peak and off-peak travel times.

When it came to choosing a database, the team prioritised real-time updates, high performance and low latency. Going in, they also had no idea what fields they wanted to include, but it had already started building the REST API for its new project, making **Azure Cosmos DB** for NoSQL the clear choice.

> **With Azure, we can have a system that dynamically inflates during rush hour and then deflates during off-peak travel times."**
>
> **Yorick Fredrix**
> Data Engineer, Nederlandse Spoorwegen

AI app innovation goals

Decongest train cars during peak hours

NS customer research showed that crowdedness is critical to customer satisfaction. While a train often has seats available in the back, they frequently go unused because passengers don't want to walk the length of the train if they don't know for certain that they'll be able to sit once they get there. The company wanted to help spread crowds more efficiently throughout the trains to decongest cars and give passengers a more satisfying travel experience.

Scale with fluctuating travel demands

Travel crowds drastically change in size depending on the time of day, week and year. The new solution needed to scale dynamically during rush hour and then deflate during off-peak travel times.

Predict travel patterns

The company wanted a more data-driven method to predict how and when people travel in order to change their service. Chip cards with check-in and check-out data could help show where and when passengers enter and exit a train, and that data can be looked at historically to predict future travel patterns.

> **Of the two million people who travel by rail each day, 95% check in to see the status of their train. Our research shows that people especially value the crowdedness indicator. They can choose from among several indicators, and most choose crowdedness – it's a very popular feature."**
>
> **Bram van Eck**
> Chief Product Owner/Senior Product Manager at NS

Solutions used

After a three-month process that took the team from proof of concept to production, NS was ready to launch its crowdedness app. The solution is built entirely on Azure – with Azure Cosmos DB at its centre – and processes hundreds of thousands of events per day. Additionally, the NS team relies on Azure DevOps to support the end-to-end CI/CD process, Azure Monitor provides application insights and alerts integrated with the team's Slack channel, and Azure Advisor helps diagnose and solve system problems.

- Azure Cosmos DB for NoSQL
- Azure Advisor
- Azure DevOps
- Azure Monitor
- Azure Databricks

Outcomes

1. Autoscaling capabilities dynamically adjust the solution to capacity

With the number of requests fluctuating drastically between peak and non-peak travel times, the team uses the Azure Cosmos DB autoscaling feature to adjust capacity in response to workload demands.

2. Predictions called 'crowded prognosis' inform crowded calculations

The team uses **Azure Databricks** to build and train machine learning models that predict how crowded trains will likely be over the next three days based on the data collected. Those predictions – what the team calls the 'crowdedness prognosis' – are delivered nightly to Azure Cosmos DB (the 'prognosis store') and used to inform the overall crowdedness calculation.

3. Improved customer satisfaction

NS publishes millions of travel advisories a day to help passengers plan a more comfortable travel route. Of the nearly two million people who travel by rail every day, 95% are using the app to check the status of their trains. From the several indicators available on the app, most travelers check in on crowdedness to plan their trip. The app also supports push notifications that alert passengers when a train's expected crowdedness has changed or when a disruption means a train will be late.

Read the full story >

The Microsoft Azure advantage for creating intelligent apps

Azure provides a wide range of tools and services that support AI development:

→ Azure OpenAI Service

Azure OpenAI Service provides access to powerful language models from OpenAI, such as GPT-4, GPT-3.5 Turbo, Codex, DALL-E and Whisper, that perform tasks such as content generation, summarisation, semantic search and natural language to code translation. Enterprises use this service to improve digital customer experience by adding chatbot/generative AI capabilities to customer-facing solutions with Azure AI services and Azure OpenAI.

→ Azure AI Search

Azure AI Search lets enterprises build rich search experiences over their private and heterogeneous data sources in web, mobile and enterprise applications. Azure AI Search utilises advanced deep-learning models to provide contextual and relevant results. It also supports features such as semantic search, knowledge mining, summary results, faceting, suggestions, synonyms, geo-search and more.

→ Azure AI services

Azure AI services is a suite of out-of-the-box and customisable AI tools, APIs and models that help modernise business processes faster. Azure AI services include services for vision, speech, language, decision, metrics advisor, immersive reader and more. Enterprises use these services to build intelligent applications that automate document processing, improve customer service, understand the root cause of anomalies and extract insights from content.

→ Azure Kubernetes Service

Azure Kubernetes Service simplifies deploying managed Kubernetes clusters in Azure by offloading the operational overhead to Azure. Kubernetes is a popular open-source platform for orchestrating containers that run applications. Enterprises use AKS to run their containerised applications at scale with high availability and performance.

→ Azure Cosmos DB

Azure Cosmos DB is a globally distributed, multi-model database service that offers single-digit millisecond response times, automatic and instant scalability and guaranteed speed at any scale. Azure Cosmos DB supports multiple data models including document, key-value, graph and column-family data. It also supports multiple APIs, such as native NoSQL, MongoDB API, PostgreSQL API, Apache Cassandra API and more. Enterprises use Azure Cosmos DB to store and query their data in the most suitable model and API for their application needs.

Power your intelligent app strategy with Microsoft Azure

AI-powered digital applications have the potential to drive business growth by delighting customers with never-before-seen capabilities. Creating intelligent apps with Azure AI tools and services makes your customer interactions more convenient, personal and meaningful – inspiring loyalty and propelling your business to the forefront of your industry.

Migrate to Azure and take advantage of its AI solutions to empower your team to develop and deploy intelligent apps quickly while maintaining the highest standards of security and cost efficiency.

Learn more about how Azure helps enterprises innovate intelligent apps while saving on costs.

Azure Innovate offers advanced analytics and support to help you build AI-infused and cloud-native apps. Explore Azure Innovate >

Develop generative AI solutions with Azure OpenAI Service >

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