



Perspectives on private cloud services for artificial intelligence



The potential of artificial intelligence (AI) is game changing. AI-driven processes and technologies can provide organizations with many benefits, including enhanced efficiency, reduced costs and time to market, improved productivity, and a better user experience. AI's ability to shape the future is driving organizations across industries — healthcare, finance, manufacturing, transportation, retail and more — to embrace its capabilities.

However, many organizations are struggling to understand how to develop an AI strategy for various use cases and select the right solution from the multitude of AI offerings and services available.

To help you make the right AI decisions for your business, this paper will highlight core AI concepts, key use cases and Kyndryl's range of AI solutions and services to guide your journey.

AI concepts

AI is broadly described as computer systems and machines that can reason, learn and act in a way that would normally require human intelligence, involving enormous amounts of data that far exceed what can be analyzed by humans alone. Although AI techniques are constantly evolving, today's mainstream AI can be broadly classified as predictive AI and generative AI.

Predictive AI systems can make informed decisions or predictions based on training data, intelligently perform specific preset tasks and help organizations extract comprehensive business insights from new and existing data to improve decision-making. Predictive AI relies on training data, applies machine learning and operates within the boundaries set by human programmers.

Examples of predictive AI include customer personalization, demand forecasting, sentiment analysis and supply chain optimization.

Generative AI can mimic — and sometimes surpass — human capacities to generate text-based and visual content. Generative AI models employ deep learning techniques to grasp patterns and structures from large data sets, which enable them to create content through sampling.

Examples of generative AI include financial reports, product documentation, software testing and application programming code.

The primary difference between predictive AI and generative AI lies in their capabilities and applications. Predictive AI systems are primarily used to analyze data and make predictions, while generative AI goes a step further by creating new data based on its training data. The following table provides a high-level comparison for these two AI applications types.

Predictive AI

Performs tasks that require human intelligence to make smart decisions or predictions

Applies machine learning models, encompassing supervised, unsupervised and reinforcement learning

Performs analysis, classification or prediction based on inputs and rules

Requires data scientists or analysts who design and implement AI solutions

Generative AI

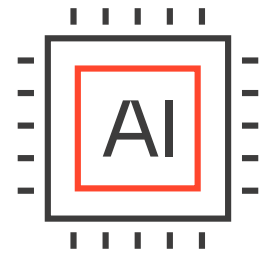
Performs tasks that require human intelligence and creates new content or data from existing inputs

Leverages deep learning models, such as variational autoencoders, generative adversarial networks and generative pretrained transformers, as well as vast amounts of training data

Produces novel and realistic artifacts that do not repeat the training data

Empowers end users by allowing natural language or other modalities

Predictive AI and generative AI: Major use cases by industry



The following table lists popular AI use cases across industries.

Industry	Predictive AI	Generative AI
Finance	- Personalized banking - Fraud detection - Risk analysis	- Investment strategies - Documentation drafting - Regulatory change monitoring
Healthcare	- Improved patient care - Medical image analysis - Anomaly detection	- Appointment scheduling - Claims processing - Drug discovery
Retail	- Self-checkout - Personalized shopping - Loss prevention	- Virtual try-on - Product image generation - Automated catalog creation
Manufacturing	- Predictive maintenance - Manufacturing safety - Quality control	- Factory simulation - Product design - Digital twins
Media and entertainment	- Content recommendations - Personalized advertising - Box-office prediction	- Content generation - Speech and music generation - Image creation
Telecommunications	- Virtual assistants - Predictive maintenance - Network performance optimization	- Marketing campaign content - Faulty equipment simulation - Synthetic network data generation
Public sector	- Disease outbreak prediction - Disaster response - Crime prediction	- Policy document drafting - Urban planning - Public awareness campaigns
Energy	- Predictive maintenance - Demand forecasting - Water leak detection	- Optimized infrastructure design - Customer support automation - Digital twins

Key business challenges and opportunities

With the myriad advantages presented by AI, organizations are looking to adopt solutions that will help them save resources through business process automation and increase employee productivity. Off-the-shelf solutions can speed AI adoption for some organizations; however, they may not be able to address some key challenges.

In addition to these key challenges, organizations have major concerns around the cost of implementing AI solutions and the privacy, exposure and control of data. To overcome these challenges, many organizations are adopting a hybrid AI approach and paradigm where they run their experiments in a public cloud – using infrastructures or services provided by major cloud providers – and then implement AI solutions in their own private cloud.

Known as private AI, this approach allows organizations to leverage compute, network and data infrastructures that they own, as well as the existing data governance, security and access rights policies, and management implemented by their IT departments. Existing investments in organizing and managing critical data can now be capitalized for AI-generated value. This approach allows organizations to keep complete control of their mission-critical training data, access rights, policies, management and models for each AI solution.

Using a private AI approach, organizations can work with technology partners like NVIDIA or AMD as hardware acceleration providers, and VMware, Red Hat, Nutanix and others to provide robust and cost-competitive private AI infrastructures. As an experienced global systems integrator, Kyndryl works side by side with organizations to design, build, implement and manage private AI solutions around the world.

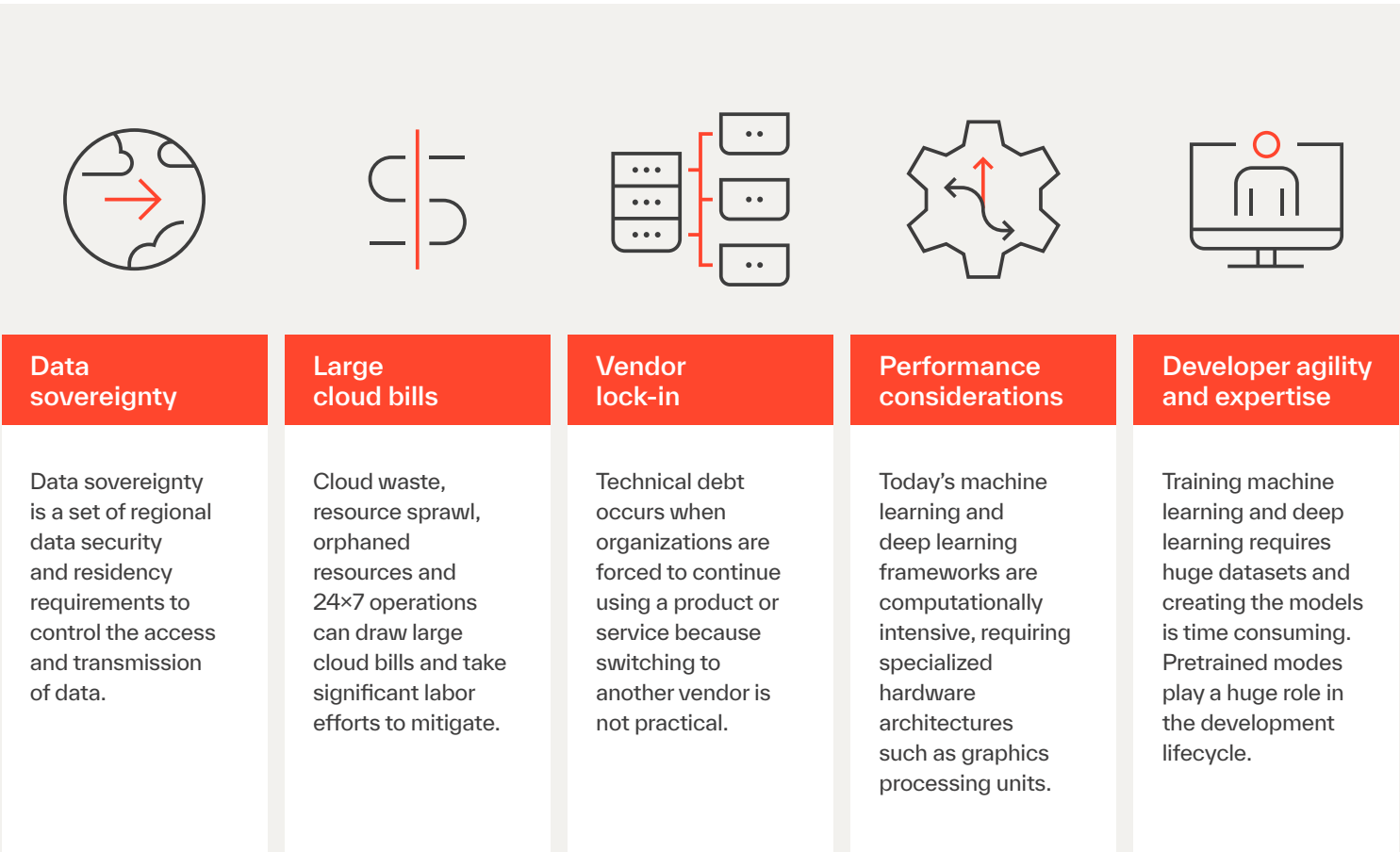


Figure 1: Key AI challenges

Private AI versus public AI solutions

With private AI, organizations develop fine-tuning algorithms on data that is proprietary and specific to one user or organization. Proprietary datasets can be brought to a pre-trained language model – such as Llama 3 from Meta or Megatron-Turing Natural Language Generation from Microsoft and NVIDIA – keeping data under the organization’s control inside company boundaries.

Data remains self-contained within the hosted environment where it resides and outputs are generated. Data and chat capabilities are available only to users within the organization who have been granted access or to customers with verified accounts. Using private language models, custom AI solutions are created using an organization’s data for domain-specific tasks.

Public AI refers to any publicly available AI infrastructure that trains on a wide set of data pulled from users or organizations and brought to the public cloud. For example, with public AI services like Azure AI or Google Vertex AI, there is no need to deploy an infrastructure to create, train and run the AI models; however, organizations need to bring their own proprietary – and, in many cases, critical – data into public cloud AI platforms. Using a public AI solution may be a good approach if data is already hosted on public infrastructure and governed appropriately. It’s possible to use a public AI solution with on-premises data, but it would require a significant lift of data governance, security and access management, which could be very expensive. It also may not comply with corporate policies and regulatory concerns around data privacy, security and governance. Private AI solutions address these concerns, as well as the challenges we outlined in Figure 1.

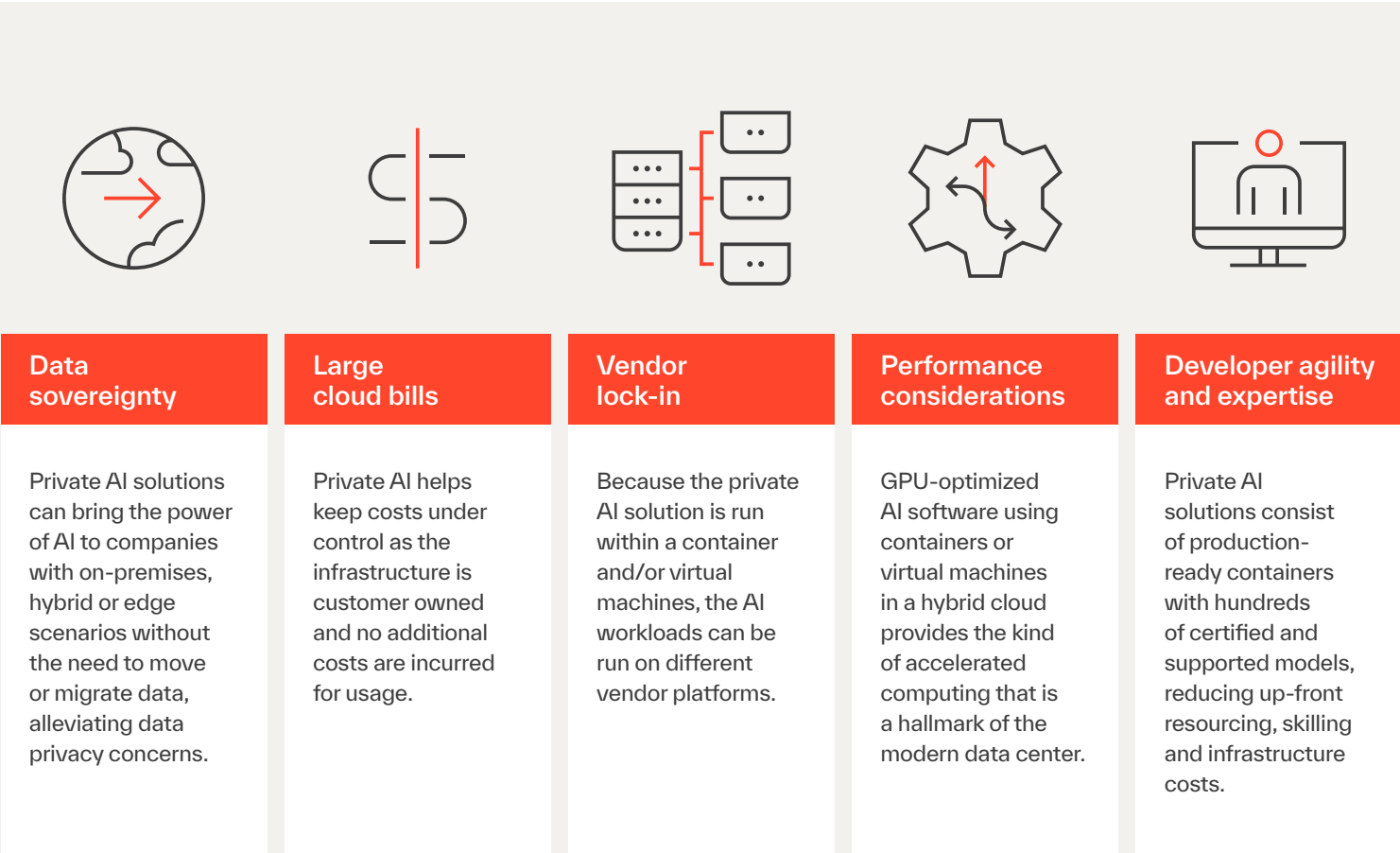


Figure 2: Addressing AI challenges

Kyndryl AI and generative AI services catalog

Kyndryl AI and generative AI services provide a way to design, run and manage AI solutions and applications for private, public and hybrid cloud environments through a modular method led by skilled experts. We work side by side with organizations to guide their AI journeys, including:

- Designing and implementing a security-rich and cost-effective private AI solution
- Defining business strategy and vision
- Implementing AI applications
- Building data and AI development and management tools
- Managing infrastructure and applications

Examples of some of our key services are listed below:

Kyndryl AI advisory services

Kyndryl advisory services bridge digital business needs with the modern IT functions and platforms that enable them. From an AI perspective, we can help organizations supercharge data-driven initiatives around a scalable platform with on-demand capabilities.

Our services can be customized for the development of an overall data strategy, as well as focused advisory in specific areas like data and AI governance, financial operations, data warehouse and business intelligence, data operations, cloud data management and enterprise AI.

Kyndryl AI private cloud services

To help customers navigate the complexities of AI, Kyndryl offers a dedicated, single-tenant, on-premises private cloud platform — whether that be in the customer's data center, a colocation facility or a Kyndryl data center — delivered as a service. The platform is optimized for AI and generative AI and includes accelerated compute, network and storage hardware and orchestrated containers for microservice and application deployment. It also includes data science tools, an AI data foundation, and pipeline ingestion architecture and services. The platform, fully managed by Kyndryl, offers the following services from day 0.

- **Day 0 and Day 1:** Design and build services
- **Day 2:** 24/7/365 infrastructure monitoring and management



Kyndryl data modernization and data platform management services

Kyndryl data modernization services are designed to help organizations create a data modernization strategy, design and build new data platforms and services in the cloud and on premises, migrate data and services from legacy systems, and modernize data processing logic, workflow and architecture.

Kyndryl data platform management services help organizations with the end-to-end operations of their data platforms. This support includes:

- Monitoring data infrastructure, workflows, pipelines, sources and endpoints for availability
- Managing deviations from expected behaviors
- Maintaining platform currency
- Implementing industry-standard technical specifications
- Recording data and metadata to evaluate the accuracy, lineage, quality and consistency of data

Kyndryl AI and generative AI services

We offer a first-hand perspective on AI and generative AI implementation while prioritizing data governance, AI policies and current data strategies for a solid data foundation.

Through AI and generative AI-readiness assessments and discovery workshops, we identify high-value use cases to drive a competitive edge and new business models.

With collaborative innovation, industry-specific models and use cases, and solutions that fuel optimal experiences, Kyndryl helps organizations achieve efficiencies and deliver greater value for their businesses. We help build trusted data foundations, architectures and LLM operations (LLMops) frameworks while generating optimized, responsible AI insights at scale.

Why Kyndryl?

Because AI (specifically generative AI) is likely the breakthrough technology of our time — with the potential for huge impact on our lives — it's a good idea for organizations to work with experienced partners who can help them move forward effectively. In choosing Kyndryl, organizations unlock the strength, expertise and reliability of a recognized global IT services organization with deep engineering roots and more than 80,000 skilled professionals worldwide.

From defining how AI and generative AI can help organizations innovate to gain a competitive edge, to determining use cases, to selecting the right solution from the many AI offerings available, Kyndryl can help organizations design, build and manage AI strategy through a modular approach. We specialize in hybrid IT environments that unlock the benefits of both on-premises infrastructure and cloud services to support AI and generative AI initiatives, providing a flexible and scalable foundation for deploying and managing AI and generative AI applications and workloads. Our experts can manage the IT environment for organizations and even rework existing infrastructure to operate in an AI-friendly environment.

Through strategic consulting and services capabilities, we strive to simplify the adoption of AI and generative AI, empowering organizations to choose cost-optimized AI solutions and design successful modern architectures.

For more information

Generative AI is an emerging technology that presents a multitude of business opportunities — but it also creates certain risks, which we did not discuss in this paper.

Learn more about [generative AI risks](#) or reach out to [Kyndryl Consult](#) to request a complimentary 30-minute consultation.



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