



3 steps to complete cloud-native modernization

A guide to business growth
opportunities and avoiding
common pitfalls

Rishi Kulkarni
Senior Vice President: Application Modernization, Cloud Services, NTT DATA



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Introduction

The move to cloud-native is happening across industries, but organizations that jump on the bandwagon without fully understanding what cloud-native means for their software applications and infrastructure risk losing out on the benefits of cloud computing, such as scalability and cost efficiencies.

There are two approaches to optimizing your applications and infrastructure for the cloud in pursuit of business agility, innovation and digital transformation:

Migration refers to a bottom-up transformation of your infrastructure to achieve the cost efficiencies, scalability and resilience offered by the cloud. It involves rehosting (“lifting and shifting”) on-premises workloads in the cloud – without making big changes to the applications themselves – or retiring workloads that can be replaced by cloud services.

Modernization is a top-down approach focused on the end-to-end transformation of business processes and applications to make your entire ecosystem more agile, flexible, scalable and efficient. It involves rearchitecting applications, an exercise that can range from simply refactoring some aspects of the code in line with cloud-native principles to completely rewriting or replacing applications with cloud-native technologies or software-as-a-service products.

Modernization goes hand in hand with migration. They are not siloed strategies but two aspects of a holistic approach to cloud migration.



Why modernization matters

If you want to launch new, better and more innovative products, you have to transform the applications at the core of your business. This will allow you to innovate and respond to your customers' needs faster and more efficiently.

The outcomes of cloud-native modernization include hard benefits – those with a discernible impact on the bottom line – and soft benefits, which have more of an indirect effect on financial performance.



Primary benefits

- Right-sizing your application portfolio to lower the total cost of ownership, improve speed and reduce complexity
- The ability to scale automatically based on business demand, thanks to the elasticity of cloud-native services
- The need for fewer software licenses



Complementary benefits

- Business agility and productivity
- Automated maintenance
- Less of a need to hire employees with specialist skills
- An always-on IT ecosystem
- Faster deployment cycles
- An improved user experience, which increases customer loyalty



Modernization also supports continuous innovation. Technologies such as 5G, IoT, blockchain, edge computing and AI deliver the most value to your organization when they are integrated with a modern ecosystem.



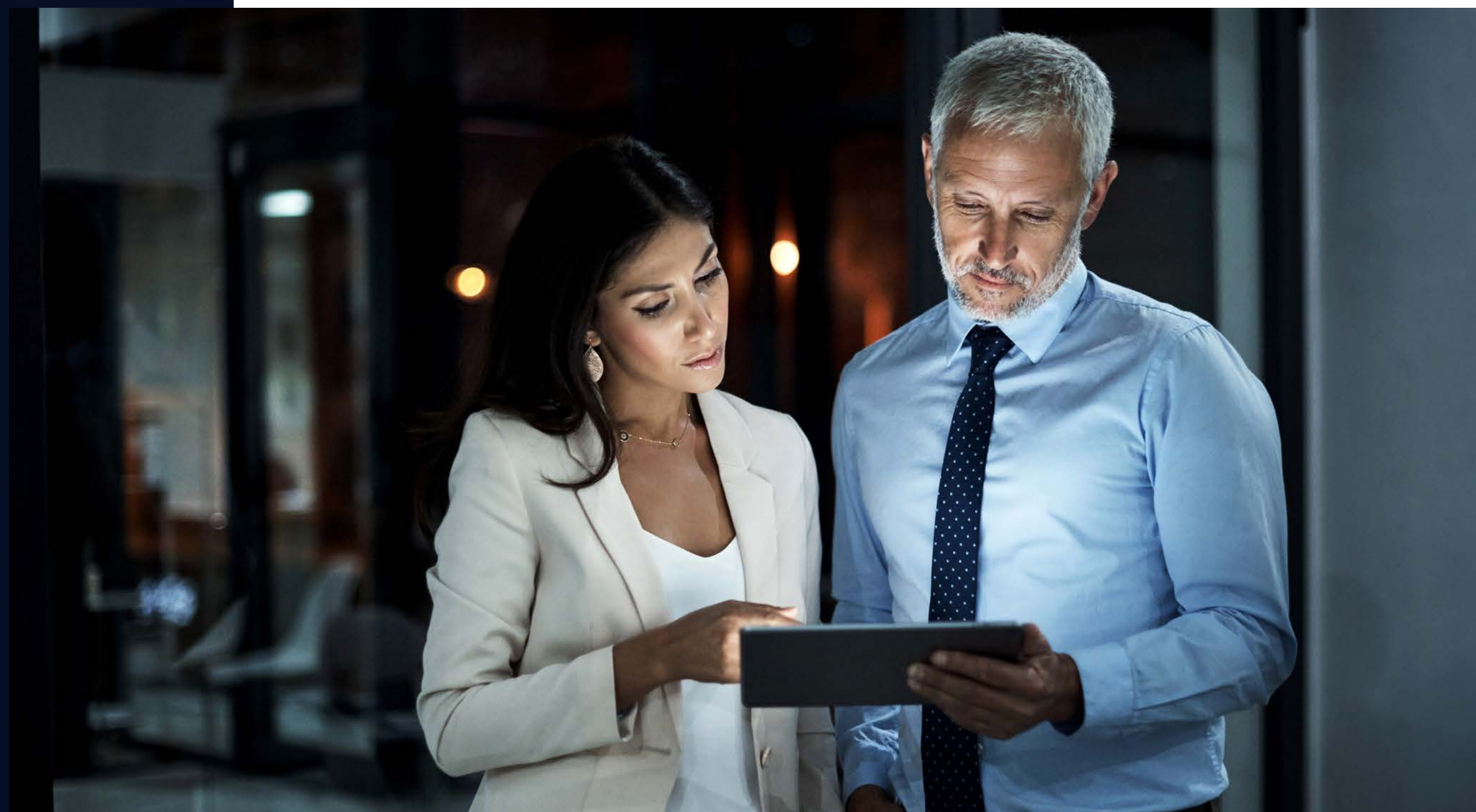
What is being modernized?

Choosing which applications and infrastructure to modernize depends on your organization's needs and goals and your current technology stack.

Modernization aims to improve business agility, enable innovation or reduce costs.

Although it's typically centered on adapting your legacy applications (custom or packaged, such as SAP or Oracle) to cloud-native architecture, modernization is not just a matter of updating an application or infrastructure.

It is more about business transformation and a means to achieve business outcomes by transforming your organization's processes, technologies and culture. If you don't pay enough attention to updating your organizational structures, procedures and skills alongside your applications and architecture, your modernization efforts may come to naught.



“ Cross-organizational transformation cannot be an afterthought. It must be planned for at the start of any modernization project.



The 6 main challenges of cloud-native modernization

1

The business case

The challenge: The biggest challenge in a cloud-native migration or modernization project is building an end-to-end business case and return-on-investment (ROI) model that maps your business goals to the key performance indicators (KPIs) for your applications and infrastructure – and then monitoring how your organization is improving because of the change.

How to address it: If your organization lacks a detailed understanding of your asset and application portfolios, you'll find it difficult to pursue a cloud-native strategy. A process of discovery and assessment will get you started on building a broader business case that includes a plan to monitor the success of each phase of your transformation journey.



2

Security and compliance

The challenge: Another major challenge is addressing the growing volumes of data residing on clouds that need protection. Identity management and threat intelligence are key in preventing breaches.

How to address it: Cloud providers invest heavily in technology that could actually improve your organization's security and data protection. Understand just what it is that they offer and how this compares with or could enhance your current security controls. Then communicate this to concerned stakeholders to strengthen your approach to safeguarding information and minimizing security risks.





3

The skills

The challenge: The employees working on or maintaining your legacy technology may not be aware of the technologies and paradigms involved in cloud-native architecture, so you face considerable cost and effort in upskilling and reskilling these employees.

How to address it: To ensure a seamless shift, you can work with global system integrators and managed service providers (MSPs) who have helped other organizations move to a cloud-native architecture. Your employees will also benefit as some of these skills are passed on to your in-house teams.

4

The technology

The challenge: You have to be pragmatic in selecting technologies. Vendor lock-in, for example, may cause integration problems in your cloud-native modernization, resulting in a complex distributed ecosystem spanning hybrid or multicloud architecture.

How to address it: Do a detailed assessment of your technology needs and their compatibility with your organization's technology footprint and evolution roadmap. Avoid creating a siloed technology landscape that will be difficult to manage.





5

The operating model

The challenge: You might find it hard to adopt a cloud-native operating model because, like many organizations, you operate in a **waterfall model** with siloed teams looking after different phases of legacy projects. Cloud-native applications require a higher level of agility and cross-functional capabilities than project-centric models.

How to address it: Adopt a highly agile, product-centric operating model with an increased focus on DevSecOps and site reliability engineering (SRE). This can be challenging and is likely to require a cultural shift among the employees involved in delivering this transformation, but can be achieved faster and with less resistance to change with the help of a system integrator.



What is site reliability engineering (SRE)?

“ SRE is a way of continuously monitoring, governing, predicting and self-healing a cloud-native ecosystem. It’s a set of practices, processes and tools that enable improvements in the reliability, availability and performance of software systems and services.

It supports the ongoing modernization of this ecosystem by establishing service-level objectives, preventing failures, monitoring KPIs, responding to and learning from incidents, supporting capacity planning, and optimizing cloud resources to reduce costs, among others.





6

The leadership

The challenge: Cloud-native modernization and migration take time and can involve multiyear programs. So, there is a risk of losing focus and impetus over time.

How to address it: Align your organization's leadership with your long-term goals. Drive these projects with a phased approach like the [strangler-fig pattern](#) (the software design and migration approach that involves a gradual transition from legacy systems to new technologies) instead of basing your strategy on immediate ROI.



Beyond the public cloud

A cloud-native approach focuses on the quality and speed of service delivery. Most cloud-native apps are built with vendor-neutral architecture in mind and can be deployed on public, private, hybrid or multicloud platforms.



While most public-cloud providers offer integrated development tools, enterprise-grade security and native management services for implementing serverless and microservices-based applications, enterprise applications such as SAP and Oracle also provide options to build and deploy cloud-native services in their ecosystems, offering an alternative to public cloud for modernizing workloads and achieving similar levels of scalability and performance.



What drives investment in modernization?

Apart from gaining scalability and moving away from your legacy technology, here are 10 compelling reasons to invest in cloud-native modernization:

- 1 It can increase application processing and response times and performance, enabling your organization to handle peak loads without overprovisioning resources or increasing costs.**
- 2 Improved interfaces and a better user experience make your applications more appealing to users, thereby driving adoption and loyalty.**
- 3 It becomes easier to use analytics, machine learning and AI to support automation and data-driven decision-making in your organization.**
- 4 It significantly reduces integration complexities because your monolithic applications and microservices can work together more easily.**
- 5 You gain access to better security practices, tools and technologies to protect your organization against cybersecurity threats and help you comply with legal and regulatory requirements.**



Cloud security: far beyond the perimeter

Cloud-native security is designed specifically for applications and platforms built and deployed in cloud environments. It's embedded in every layer of the application architecture to cover identity and access management, API security, container security, workload security and more.

And, it's built into applications and infrastructure from the start, rather than added on as an afterthought. The goal is to protect against vulnerabilities unique to cloud environments while ensuring your workloads are compliant with industry or geospecific regulations and standards.

- 6 You can more easily experiment with new features, services and business models.
- 7 You can save costs thanks to better resource allocation, automation, eliminating redundant or inefficient processes, and no longer having to maintain outdated applications and infrastructure.
- 8 It can be easier to recruit and retain skilled employees who are attracted to modern technologies and an agile way of working.
- 9 Your applications can leverage API-driven and DevSecOps mechanisms to make your operations more energy-efficient and reduce your organization's environmental impact.
- 10 Modernized applications enable teams to complete more work in a specific timeframe, so you deliver results faster.



The 3 steps to modernization

1

Start with an assessment

First, understand your objectives. What kind of flexibility do you need to build in and how will you approach innovation so your organization can continually respond to changing customer and market needs?

Then, examine your entire ecosystem to determine what needs to be modernized and which approach to take. To get the most out of your investment, include change management and the transformation of processes alongside the modernization of your technology.

By aggregating data, it's also possible to group applications by theme – for example, by criticality, problem volume, risk or cloud suitability – to drive stability and velocity.

A what-if framework is a key part of the assessment. It sets out your organizational strategy, vision and guiding principles to drive decision-making and provide parameters for how IT will engage with the business.

“

An in-depth understanding of your current IT landscape gives you a strong foundation for a business case and outcomes-oriented roadmap, as it can help you identify what to eliminate, consolidate, modernize, replace or remove, and where to invest.



2

Build a roadmap and business case

Your execution roadmap should prioritize initiatives such as application modernization, cloud infrastructure and DevSecOps automation based on the timelines, costs and other findings documented during the assessment phase.

[Gartner's Pace-Layered Application Strategy](#) is a good place to start: it helps you categorize the value of your applications, the pace of change, and what to invest in, tolerate, eliminate or consolidate.

When you're categorizing your applications, consider whether they are systems of innovation, systems of business differentiation or systems of record. For example, if an application is designated as a system of record to tolerate, you'll need to invest in incremental transformation to get it cloud-ready. For an application that's already cloud-based and seen as a system of innovation and differentiation, your focus will shift to the people and processes associated with the application.

To build your business case, you need to analyze the motivations for cost savings and develop a current-state cost model per application (to calculate the average monthly cost of a virtual machine) and per database. Compare this with the costs of cloud hosting to help prioritize IT spending decisions.

“Your business case should cover the financial rationale for modernization – including anticipated costs and savings. It should provide an ROI forecast and align IT changes with business KPIs to make sure that project funding will be available at the right time.”





3

Plan to manage change

Your strategy for change management should set out the organizational shifts you'll need to support technological change. Include a target operating model that records the make-up of the "new" organization, including roles and responsibilities, and the skills you'll need to develop (by upskilling existing teams) or recruit.

Determining this strategy is critical to any transformation program and is likely to involve workshops, interviews and other assessments to find alignment across your organization.

A deep understanding of your organization from the bottom up and a roadmap based on thorough research will enable you to manage and track your transformation effectively.



Watch out for these pitfalls



1

Your roadmap and business case

Embarking on modernization without clearly defined goals and objectives can lead to directionless efforts and on-the-spot decisions, resulting in wasted resources, scope creep and missed opportunities. Similarly, failing to involve key stakeholders in your organization can cause resistance to change and misalignment on how to achieve business goals.

2

The discovery and assessment phase

Don't underestimate the complexity of modernization efforts, especially for legacy systems, where it's easy to overlook system and business process dependencies – if you do, you are likely to face delays and cost overruns. Neglecting security and compliance considerations can expose you to data breaches and regulatory issues, for example.



Watch out for
these pitfalls





3

The execution and delivery model

Don't execute cloud-native projects in the waterfall model, and keep in mind that a lack of automation will hamper your modernization lifecycle. Having siloed teams working on different phases of your modernization project can lead to unexpected issues, as will inadequately testing your modernized systems.

Plan for some scope creep along the way, but take care not to let the project's scope expand beyond the original plan, as this is likely to lead to delays and budget overruns.

Failing to prepare your employees for the changes associated with modernization can result in resistance and reduced productivity.

Also, don't forget the value of a comprehensive cloud economics strategy in optimizing the financial management of cloud resources and services within your organization.

4

The technology

Adopting a cloud-native design without a proper strategy – deciding between [Kubernetes](#) and managed container services, for example – can lead to suboptimal cloud deployments and cost inefficiencies.

An overreliance on specific vendors or proprietary technologies can limit your flexibility and increase costs in the long term. And, while you're looking ahead, be sure that your architecture will be able to support application management and maintenance well beyond the initial modernization project.



Watch out for
these pitfalls



In short: 11 principles of implementing cloud-native architecture

- 1 Build with the business in mind. Use domain-driven design and **bounded context principles**, which help define the boundaries of a domain within a software system to ensure clarity, maintainability and ease of development.
- 2 Embrace API-first, cloud-first, container, serverless and event-driven architecture.
- 3 Gaining velocity takes time: start small and deliver incremental business value via minimum viable products and the strangler-fig pattern.
- 4 Adopt platform-driven architecture and **multitenancy patterns** to ensure scale and flexibility in terms of observability, disaster recovery and more.
- 5 Adopt the **"15 factor" principles** for building and deploying applications in the cloud.
- 6 Embed security and compliance in each layer of your architecture and every phase of the software development lifecycle.
- 7 Design for resilience and decoupling across all layers of architecture.
- 8 Design with **site reliability engineering** in mind, and align your business objectives with service-level objectives and indicators and your KPIs.
- 9 Enable an automation-first approach and self-service capabilities.
- 10 Adopt **agile best practices** with a product-centric delivery approach.
- 11 Don't reinvent. Use proven tools and patterns, but remember that one size does not fit all – rely on expertise from vendors and system integrators to tailor solutions for your needs.



Why partnerships make sense

Most successful organizations work with trusted IT partners so they can focus on their core business while their IT ecosystem is managed by experts.

System integrators have the skills needed to build and manage modernized applications and infrastructure in line with best practices and execution templates based on large-scale implementations and years of investment in research.

They also continually invest in new technologies such as generative AI to improve their overall speed of delivery and efficiency, which means their clients stand to benefit from these technological advances without having to make the investment themselves.

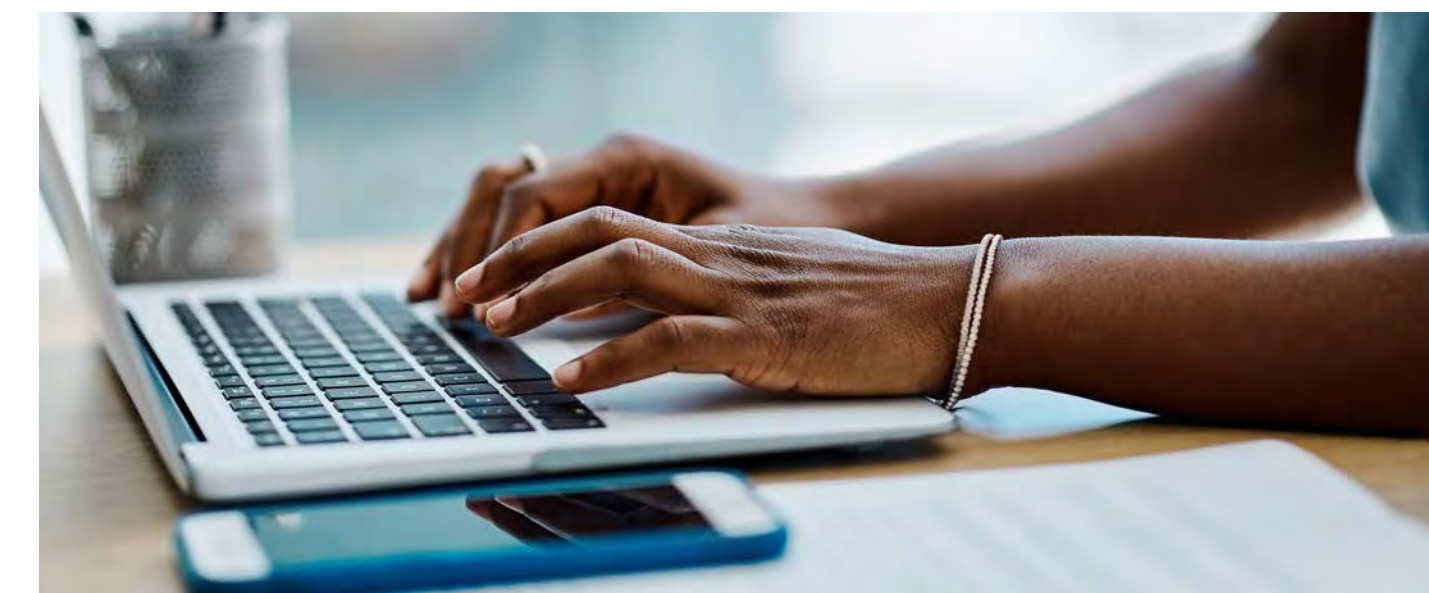
The need to work with an external partner can become obvious during the initial assessment stage, when you're faced with the complexities of compiling a comprehensive roadmap and business case for cloud-native modernization.

If you're considering working with a systems integrator or managed service provider, consider:

- Their track record of delivering similar initiatives
- How experienced they are – not only in the relevant technologies but also in your industry
- Their client references and success stories
- Their ability to scale and evolve in line with your business needs
- Their approach to innovation
- Whether their organization's culture is compatible with yours
- How transparent they are in terms of costs and their ability to adapt to change
- Their partnership ecosystem
- Best practices and templates that they can access to improve your speed to market and reduce overall costs

You may require multiple rounds of evaluation – and even pilot projects – before entrusting a systems integrator with your migration and modernization contract.

Ultimately, an expert partner must be able to set out, in detail, all impacts on your organization during and after modernization, including how your operating model and organizational structure will be affected, the ROI and how incremental business value will be delivered.



Why
partnerships
make sense



Cloud-native done right: speed, quality and innovation

Increased complexity, cloud sprawl and ageing systems have made it difficult for many organizations to improve customer experience, achieve operational excellence and drive cost savings.

At NTT DATA, we do cloud-native modernization and migration right. We use a combination of tools, best practices, code bases and accelerators to ensure your cloud-native applications, workloads and business processes are improving the time to value for your organization.

Working alongside your team, we build, deliver, manage and maintain cloud-native applications and services. Our cloud-native transformation development practices, site-reliability engineering and enterprise application services will improve your speed to market, resolve vulnerabilities in your applications and technology stacks before they affect your business, and reduce the time it takes to deliver business-essential applications.

Plus, with our industry cloud blueprints and building blocks, you'll have more time and budget to innovate and drive end-to-end reliability across a variety of cloud platforms.



