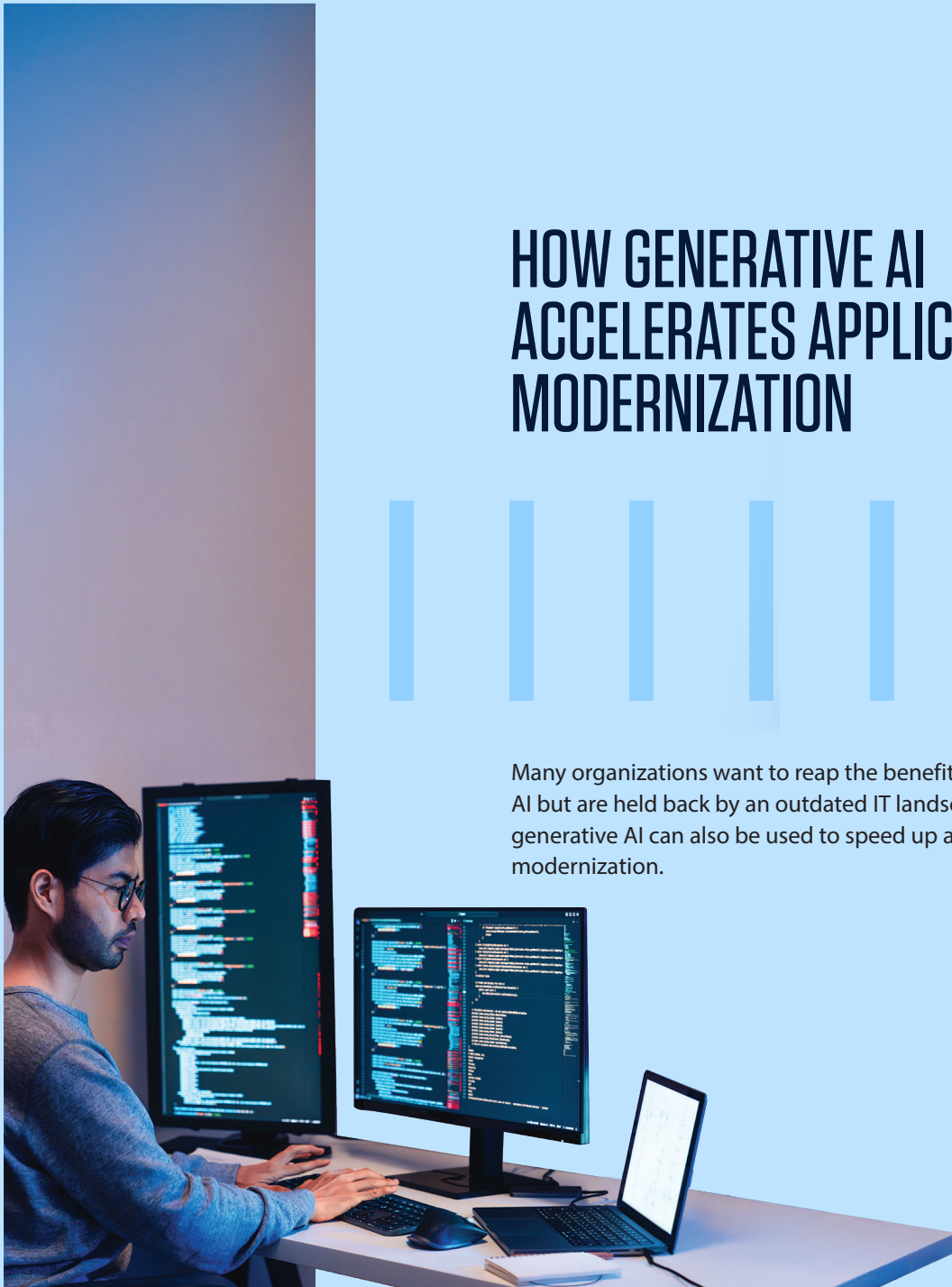
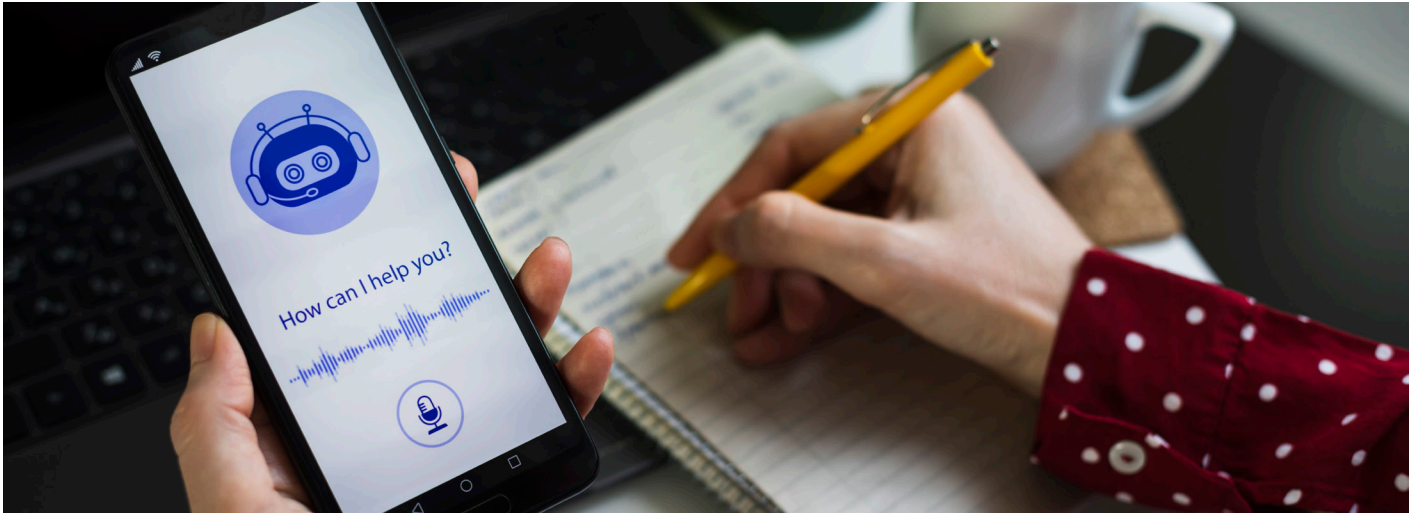


# HOW GENERATIVE AI ACCELERATES APPLICATION MODERNIZATION

Many organizations want to reap the benefits of generative AI but are held back by an outdated IT landscape. Fortunately, generative AI can also be used to speed up application modernization.





As artificial intelligence (AI) innovations promise to reshape industries, companies are under pressure to modernize, or risk being left behind. Generative AI products and services provide an opportunity to enhance efficiency, accelerate innovation, and boost competitiveness, but many organizations face significant barriers to using them because of outdated IT landscapes.

According to [Infosys research](#), 84% of organizations expect the use of generative AI to increase profits, with 83% anticipating lower costs and 82% better business models. Yet despite this optimism, [only 9% of organizations](#) have the technological maturity to be able to benefit. This means most lack foundational capabilities — such as scalable cloud environments, flexible architectures, and real-time data systems — to integrate AI tools into their business and workflows.

Application modernization offers a clear solution for enabling AI, with significant, measurable benefits. Research estimates that businesses investing in modernization initiatives can expect a return on investment of [more than 200% over three years](#). It is important for organizations to choose the most appropriate modernization route for their needs. Three stand out:

First, transitioning from monolithic to microservice architectures, which enables the agility and flexibility required by modern applications. Second, modernization of applications on the cloud, which offers scalability at a lower cost as well as advanced data integration. And last, modernizing databases, which ensures that data — the crucial building blocks of today's business operations and what drives the reliability of AI systems — is available in real time, wherever it is needed.

The first route encompasses the second and third ones — building applications on the cloud and database

modernization — but these can also be undertaken independently if there is no monolithic architecture to replace.

Whichever route is chosen, generative AI can help make the application modernization journey faster and more efficient, in addition to improving business outcomes and processes.

[Building applications on the cloud and database modernization can be undertaken independently if no monolithic architecture is in place](#)

## Overhauling legacy landscapes: from mono to microservices

To stay competitive, organizations need to use modern applications and services such as real-time, personalized customer experiences. These require an IT architecture that supports scalability and flexibility, meaning it must be able to process large amounts of data at speed, deliver content dynamically based on context, and deploy AI-powered, real-time decision-making capability for an application such as a recommendation engine. Outdated IT systems can't do this.

In monolithic architectures, adding new technology components or updating existing ones can mean knock-on changes to the entire ecosystem. A new AI-powered recommendation engine, for instance, might demand changes to the inventory management system, which in turn could necessitate changes to the underlying application, its interfaces, and the database. When technology components are so entwined, single updates become massive projects, slowing product releases and raising software delivery costs.

With a microservices architecture, each part of the system can be updated, replaced, or scaled independently, without affecting the others.

If new large language models (LLMs) are published, such an architecture will provide a plug-and-play solution to replace older versions with the latest models. A microservices architecture also enables the required services to be delivered faster and at lower cost. Such flexibility allows businesses to continually improve operations, keeping them competitive and responsive to customer demands.

## Understanding current systems with generative AI

However, untangling a monolithic architecture to create a microservices model isn't easy, particularly if the system is old. The software might be written in a deprecated language, such as COBOL, Natural, or PowerBuilder, and the staff who had a deep understanding of its workings might have retired or left. Documentation is also often incomplete.

Generative AI can help overcome these problems and accelerate modernization. For example, it can be used to understand how legacy systems function through detailed business requirements. The resulting documents can be used to build new systems on the cloud in the second phase. This can make the process cheaper too — and thus easier to get business cases approved. Additionally, generative AI can help create training documents for the current system if the organization wants to continue using its mainframes.

## Building new systems with generative AI

Generative AI can turn business requirements into application and database design documents, as well as generating microservices and the underlying code for direct deployment on the cloud. The generative AI-based modernization approach can quickly replicate the database schema into the new database and migrate the data. This helps build a new application from a legacy system faster and with less effort and human intervention.

That's how it worked for a leading credit card company struggling to modernize its legacy applications. Manual efforts were slow and error-prone due to system complexity and dependence on individual experts. Using generative AI tools trained to check their facts against external sources, Infosys extracted business rules and generated Java code with over 85% accuracy in a pilot, a high number given the number of hallucinations current models are vulnerable to. Given that substantially fewer lines of code needed to be written, this reduced the manual effort involved in modernization by up to 50%, accelerated the process by up to 30%, and cut manual defects by half.

## How to unleash cloud agility

Infosys research suggests that [nearly 75% of surveyed companies report building applications in the cloud as very effective or extremely effective](#) to meet growth and transformation objectives. Cloud migration or building new cloud-native applications is a critical strategic move for organizations that want to deploy the latest technology and stay ahead. Once achieved, it provides applications with the necessary computing power and scalability more cheaply and efficiently. Having cloud environments also enables organizations to use generative AI tools in their own processes or to offer them to customers.

Here again, generative AI can accelerate the journey, automating tasks such as requirement gathering, design, and testing. It can also generate the business logic required for the application to function. According to experts in Infosys's modernization practice, 50% of the required business language can be generated using LLMs — although it remains crucial that humans review any code generated by the AI.

Infosys recently worked with an oil and gas company to help migrate a critical application — the only IT platform for physical oil operation/movements scheduling and trading across the globe — to the cloud and enable cloud platform as a service (PaaS) abilities. The aim was to upgrade the old software and simplify application deployment. The generative AI tools produced real-time code suggestions, offered alternatives for legacy code, and helped to identify security issues. The result was a 20% reduction in migration effort by using fewer resources, with few security issues or bugs.

In another case, an energy provider wanted to migrate its application estate to the cloud in order to move away from legacy architecture that was reaching the end of its life, while at the same time improving scalability to meet future business demand. Generating code and test cases manually for this migration was slow and error-ridden. Using generative AI tools, Infosys automated much of the process, including writing code and creating templates for cloud infrastructure. This reduced manual inputs by 15%, accelerating the migration.

## Database Modernization

A microservices architecture running on a cloud-based system is a key element of modernization, but how the underlying data is organized often needs to be addressed too. Fraud is a significant challenge for the financial services sector, for example, and AI can be used to [detect it faster](#)



and more effectively, potentially saving money. But this can only happen if the AI tool has efficient access to all the data in one place.

When data is held in silos that can't be connected, or in older databases that can't respond to queries at the speed and scale required by modern applications, then these types of use cases are not possible.

A global financial services company had over 169 petabytes (PB) of data stored on more than 90,000 servers in 21 data centers around the world. This created multiple siloes that were hard, if not impossible, to connect. Infosys created automated data pipelines, moving 50PB of crucial data to Google BigQuery with attribute-level lineage, providing a deep understanding of how specific pieces of data were handled. This provided a unified view of customer data across the company, while making data accessible for AI models. Using leading open-source technologies, a scalable integration solution was built that enabled improvements such as reducing customer onboarding from four weeks to 15 minutes, and daily liquidity reporting from nine hours to two and a half hours across 28 countries. The bank is now

able to use the easily accessible data to feed any AI models it chooses.

Migration is time-consuming and complex, but generative AI can help here too. Feeding generative AI models with legacy database objects means they can help migrate these from legacy technologies such as Oracle, DB2, and Sybase to newer databases such as PostgreSQL or SQL Server.

## People are still vital

Generative AI can accomplish a great deal, but it is not the solution to every problem in application modernization. For some legacy systems written in older languages or using custom-built software, there might not be enough examples with which to train AI to generate solutions or create workflows. In these instances, companies will have to rely on their human experts to manage modernization patterns.

Furthermore, not all tasks are appropriate for generative AI. Deciding which processes to optimize and in what order is often best led by humans who understand the nuances of the business and specific organizational challenges.



It is also important to remember that these modernization patterns still require a human in the loop. Their role is to ensure the accuracy, quality, and optimization of the generative AI-generated code, requirements, and other artifacts. This is especially true for business-critical functions where mistakes could be costly.

Finally, some organizations are likely to be more cautious in deploying generative AI, particularly in highly regulated sectors such as healthcare or finance, because of data security and intellectual property concerns. This might result in edicts limiting how generative AI can be used in systems that store or process sensitive data.

## A powerful partner and platform

No modernization project will succeed without a careful assessment of what is actually needed, so any project must begin with thorough preparation to ensure you use the most appropriate technology available for the required purpose.

Draw on experience within your network to gather as much knowledge as you can about your IT landscape, your

business needs, and the technological opportunities. It's important to be pragmatic; there is only so much you can achieve with your team and the time available, so prioritize your key targets and plan ahead. Working with a partner can also make for a smoother journey.

Generative AI is now a crucial part of the application modernization journey, providing the tools and capabilities needed to overcome legacy-system challenges, accelerate cloud migration, and enhance database performance. While AI is not a magic bullet, its ability to help streamline complex processes, reduce costs, and speed up the journey toward modern infrastructure makes it an indispensable part of any digital strategy. Also important is having a tried and tested platform supporting multiple modernization patterns that can leverage the right fit generative AI model while providing a workflow for human review of every output.

As businesses continue to adopt advanced technologies for modernization, those that achieve sustained success in their innovation and growth ambitions will be those that use AI prudently as part of a wider strategy, building on a strong organizational culture as a catalyst for change.

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