4th ANNUAL

Mainframe Modernization

Business Barometer Report

advanced

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Mainframe Modernization Business Barometer Report

INTRODUCTION

As the pressure of industry competition rises and economic downturns loom, organizations worldwide are embracing change, investing in IT transformation, and rethinking their approach to mainframe modernization.

From banks to hospital systems to government agencies, the same story is playing out among C-suites: Increased industry competition and an economic downturn are forcing organizations into change. Both threats have sparked new investments and ideas as organizations aim to find the best path forward.

Many were already transforming their IT landscapes so they could become more nimble and agile, and now those calculations are more precise and inspired by new priorities, like sustainability and the AI revolution. Gartner predicts that an overwhelming 90% of organizations will turn to generative AI as a workforce partner by 2025.

We talked with 400 decision-makers across the globe to find unique insights into how mainframe modernization is shifting. Each individual who participated in the survey represents a company that runs at least one mainframe, and the data shows a wide spectrum of initiatives and approaches to meeting those goals.

One constant across all verticals is that transformation doesn't spell the extinction of mainframes. In fact, a whopping 92% of organizations are considering mainframe modernization, and only 6% believe the mainframe will be replaced by alternative technologies in the near future.
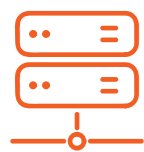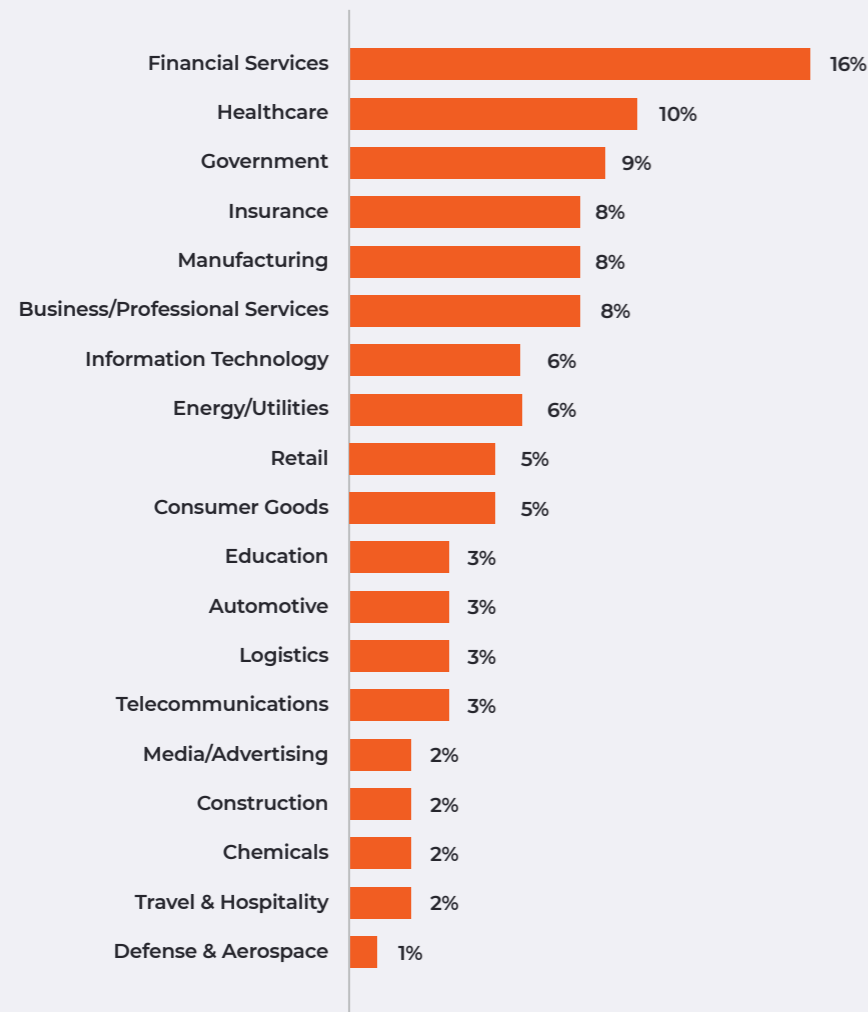
In this report, we explore how organizations are modernizing their mainframe infrastructures and why so many are no longer rushing to get all applications into the cloud – as we saw amid the pandemic-induced frenzy. Since 2020, when cloud migration was almost unanimously a top priority, some organizations made the quick decisions to migrate to the cloud en masse, and we're seeing the pendulum swing the other way in 2024.

90%
of organizations will turn to generative AI as a workforce partner by 2025 (according to Gartner)

Which sector does your organization primarily operate in?

Sector	Percentage
Financial Services	16%
Healthcare	10%
Government	9%
Insurance	8%
Manufacturing	8%
Business/Professional Services	8%
Information Technology	6%
Energy/Utilities	6%
Retail	5%
Consumer Goods	5%
Education	3%
Automotive	3%
Logistics	3%
Telecommunications	3%
Media/Advertising	2%
Construction	2%
Chemicals	2%
Travel & Hospitality	2%
Defense & Aerospace	1%

92%
of organizations are considering mainframe modernization

In 2022, 19% of respondents said cloud migration was the most important strategic initiative for their company — second only to digital transformation. This time around, cloud migration was the top strategy for only 10% of respondents, ranking sixth on the list. As was the case in our last report, digital transformation still reigns supreme, but it only narrowly edged out resilience this year.

Clearly, wholesale migration off mainframes isn't the silver bullet it was once thought to be, and organizations are finding a more deliberate and thoughtful path forward. On average, almost half of an organization's IT infrastructure still relies on mainframes, yet organizations typically allocate only 8% of their IT budget annually to mainframe technology. The imbalance between mainframe use and spending has led organizations to become more intentional in choosing which specific workloads they move and which should stay put. One American retail company put it this way:

"We are on our journey to transition from the mainframe since it is now considered as an old technology. It is not like we will replace it completely when we are exploring modern solutions. It's important to recognize that newer doesn't always equate to better. We are basically utilizing a mix of technologies like cloud, edge computing, and mainframe. But alongside other technologies, mainframes continue to serve as the most sensible choice for us. We also evaluate how well a particular technology can facilitate our organization's modern operations. Talking about the proportion, I would say, around 75% of our applications are on the mainframe whereas the remaining 25% is on cloud and other technology."

Throughout this report, we'll hear other organizations' stories and highlight the trends that have developed both within industries and across the board.

Advanced is committed to understanding modernization objectives and bringing the right skills and experience to support those paths forward. Whether optimizing mainframes, enabling AI, finding the right cloud balance, or driving efficiency, it takes careful consideration to transform an IT landscape in a way that overcomes business challenges.

Tim Jones, Managing Director, Application Modernization, Advanced

1 | Key findings

KEY FINDINGS

Our findings indicate that even though modernization remains a priority for many organizations, it doesn't necessarily mean that they are abandoning the mainframe entirely.

Dependency breakdown

52%

of organizations plan on maintaining or growing their dependency on mainframes

Mainframes aren't just here to stay, in some cases they're a preferred host of sensitive data for security reasons or a source of cost savings.

Companies with revenues of $10 billion or more are **16%** more likely to scale their mainframes to the needs of the business than average, and **18%** of healthcare organizations plan to grow their mainframe ecosystems, more than any other sector.

AI's growing role

52%

of organizations say AI innovations have significantly impacted their perspectives and prompted them to accelerate migration off the mainframe

The tremendous promise of AI has attracted growing enterprise use. Forrester predicts AI will boost productivity and creative problem-solving by **50%** in 2024. Insurance (**64%**), high-revenue (**68%**), and U.S.-based (**57%**) organizations were more likely to report a significant AI impact on their modernization plans, according to our report.

Rise of mainframe DevOps

96%

of organizations say mainframe modernization efforts led to increased adoption of DevOps
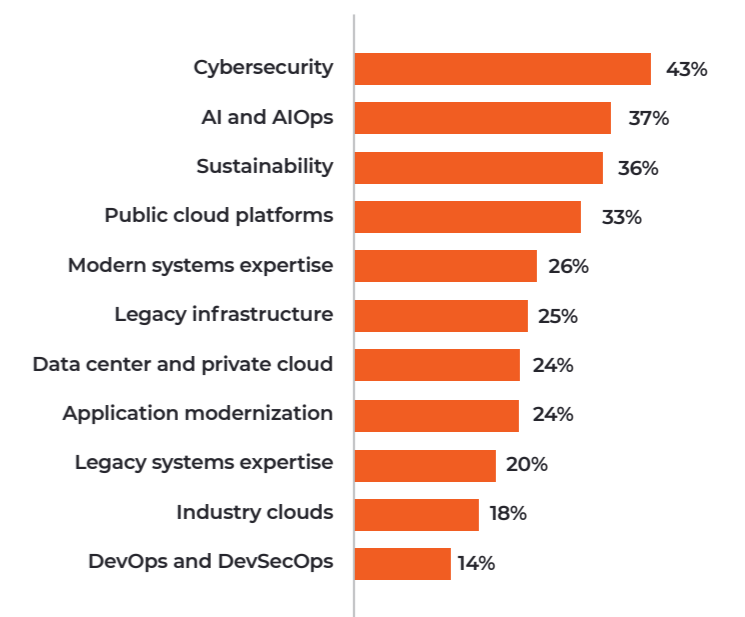
DevOps has become a staple of modern application development, unlocking agility and accelerating timelines for both developers and operations teams. Modernizing legacy systems creates an environment conducive to driving collaboration between teams so they can achieve efficient, competitive, and sustained innovation.
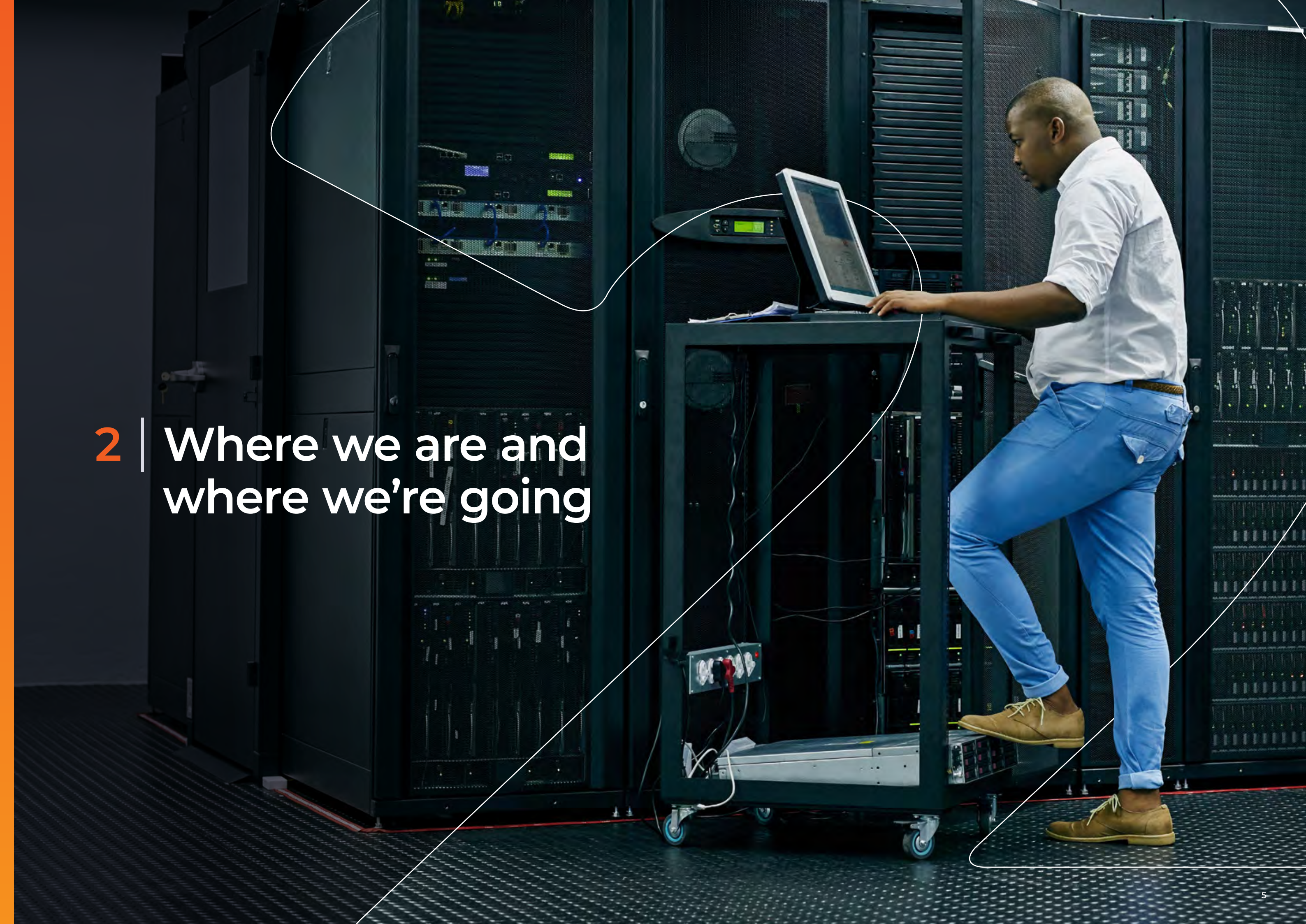
In fact, **50%** of respondents said DevOps is fully integrated and mature across all systems, while **25%** report adoption is more advanced in the broader organization than for mainframe-specific functions.

Follow the money

Top 3

Areas of focus receiving the most investment

Cybersecurity	43%
AI and AIOps	37%
Sustainability	36%
Public cloud platforms	33%
Modern systems expertise	26%
Legacy infrastructure	25%
Data center and private cloud	24%
Application modernization	24%
Legacy systems expertise	20%
Industry clouds	18%
DevOps and DevSecOps	14%

2 | Where we are and where we're going

One of the perceived benefits of cloud migration initially was offloading security accountability to the cloud providers. These days, organizations want some of that accountability back, particularly for the workloads that are most important to them.

More than half of respondents say mainframes are the preferred platform for core applications (56%) and legacy applications that have complex dependencies on mainframe infrastructure (51%).

Organizations are willing to accept the risk of workloads on legacy systems if they're kept internal and look for support in other ways than just migrating to the cloud. External providers can help bridge the skills gap left by mainframe programmers who exited the workforce, and migrating to database structures that are more widely supported helps, too.

At the same time, data analytics and reporting applications are seen as better suited for the cloud (54%). The agility, flexibility, and innovation capabilities of the cloud are appealing for workloads that are more dynamic or customer-facing. The cloud provides the ability to scale analytics on demand and tap into emerging capabilities around AI/ML, big data tools, and visualization.

A division of deployment is emerging — mainframes for core, cloud for innovation. But overall, 72% say modernization efforts have reinforced the importance and viability of mainframes in their technology stack. Most recognize that a hybrid approach balances the strengths of mainframe and cloud most effectively, with 92% favoring this direction.

56%

Say mainframes are the preferred platform for core applications

"We still rely heavily on mainframes for core applications and processes like underwriting and particularly for storing large-scale transactional data, which is sensitive financial information of our customers. At the same time, we have applications on the cloud as well like fraud detection, risk management, claim processing, customer portals, and data analytics capabilities."

Project Manager of a large insurer in the United Kingdom
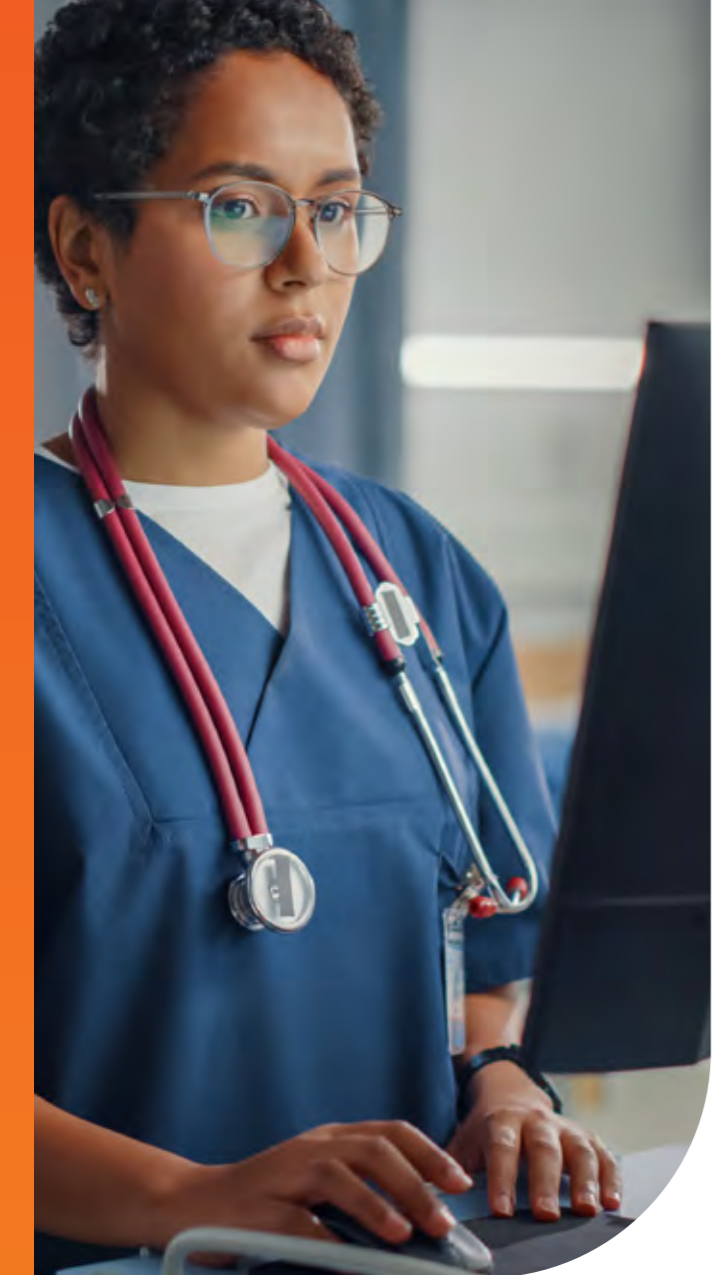
Even with a roadmap in hand, modernization efforts have been and continue to be complex to navigate

Case in point: 86% of respondents say they started mainframe modernization projects in the past, but only 22% reported success, likely due to a combination of ineffective strategy, planning, prioritization, and execution.

This underscores the significant hurdles organizations face when attempting to modernize core mainframe environments. The top three challenges cited were complexity (40%), project cost (36%), and risk (33%), but organizations can run into a litany of obstacles that can take a project off-track. Attempting large-scale migration without fully understanding workload interdependencies or time and budget needs has led many to underestimate the impact of modernization.

Organizations have lofty goals. Respondents were asked to rank their top three success criteria for measuring the effectiveness of mainframe modernization, and eight factors ranked fairly evenly, within six percentage points of one another.
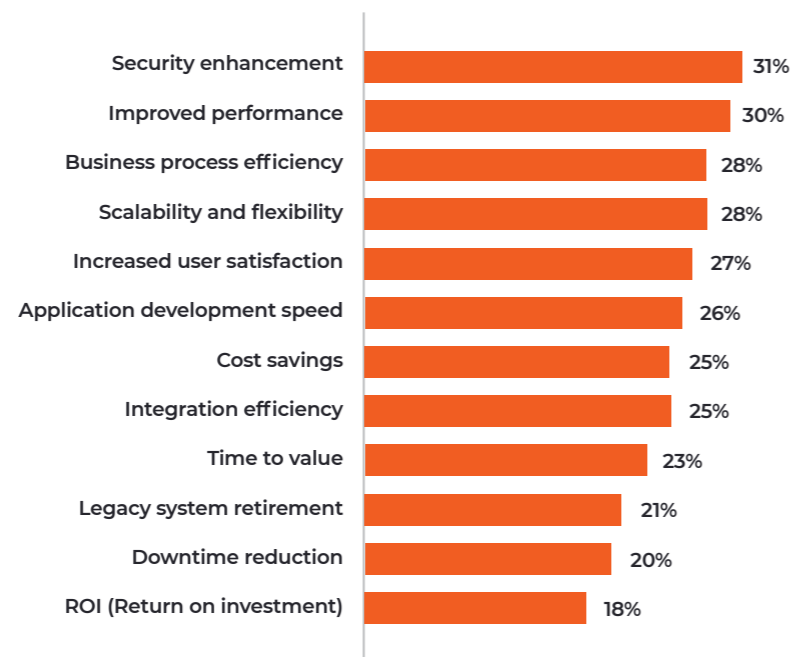
31%
Say security enhancement topped their list of goals

"We are fully committed to embracing a multi-pronged approach to our mainframe strategy. This approach includes collaborating with technology partners, consultants, and experts in the field to ensure that we have access to the latest innovations and best practices inmainframe management. By doing so, we aim to extend the lifespan of our mainframe systems, making them more adaptable and efficient for the long term."

Project Manager at a large financial institution in the U.S.

Top success criteria to measure effectiveness of mainframe modernization

Criteria	Percentage
Security enhancement	31%
Improved performance	30%
Business process efficiency	28%
Scalability and flexibility	28%
Increased user satisfaction	27%
Application development speed	26%
Cost savings	25%
Integration efficiency	25%
Time to value	23%
Legacy system retirement	21%
Downtime reduction	20%
ROI (Return on investment)	18%

Security enhancement (31%) topped the list, and that is valued even more (46%) by healthcare organizations that are increasingly in threat actors' crosshairs. The rise in frequency and severity of cyberattacks on the healthcare industry prompted the Cybersecurity and Infrastructure Security Agency (CISA) and Department of Health and Human Services (HHS) to produce a toolkit for those organizations.

The need to modernize can be influenced by any number of factors, and organizations need to make those calculations carefully to determine what modernization looks like for their specific needs.

"We are continuing to balance digital innovation with cost-efficiency and security," said a UK-based Project Manager. "Simultaneously, we remain committed to maintaining the stability and security of our existing mainframe infrastructure, as the trust of our clients is everything in our industry. We have lots of legacy, lots of environments that cannot be upgraded or will take a lot of time to upgrade, so that will be a gradual journey for us."

Modernizing boils down to thoughtful and pragmatic approaches based on business priorities. A lack of upfront planning and analysis is a recipe for cost overruns, time delays, and underwhelming results. Executed right, modernization can deliver security, performance, and efficiency gains.

There's reason to be optimistic about the future of the mainframe — 68% of respondents believe mainframes will continue being a critical technology platform for large enterprises over the next five years.

Another 26% see mainframes gradually declining in prominence, but still maintaining a presence in certain industries and use cases. Only 6% feel full mainframe replacement is imminent.
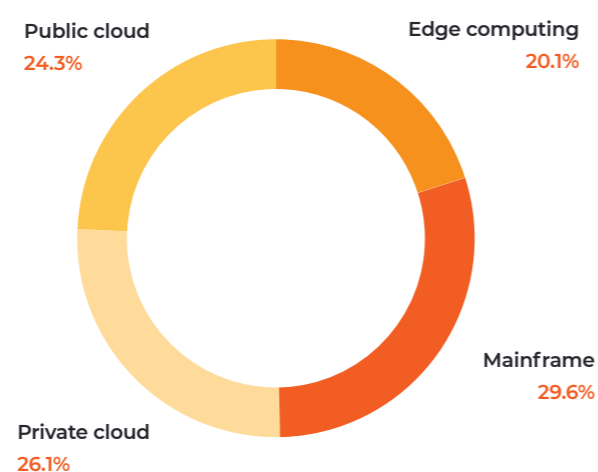
This confidence stems from the recognition of mainframes' ongoing strengths around security, reliability, and performance for mission-critical workloads.

While priorities are shifting to AI, analytics, and agility, hybrid environments allow mainframes to operate alongside the cloud and deliver the best of both worlds. Though mainframe roles will evolve, the platform is expected to remain integral for most organizations. Rather than rip-and-replace, the emphasis is on pragmatic modernization to keep core systems humming while embracing innovation.

2023 IT estate

Public cloud 20.7%
Edge computing 17.5%
Private cloud 20.1%
Mainframe 42%
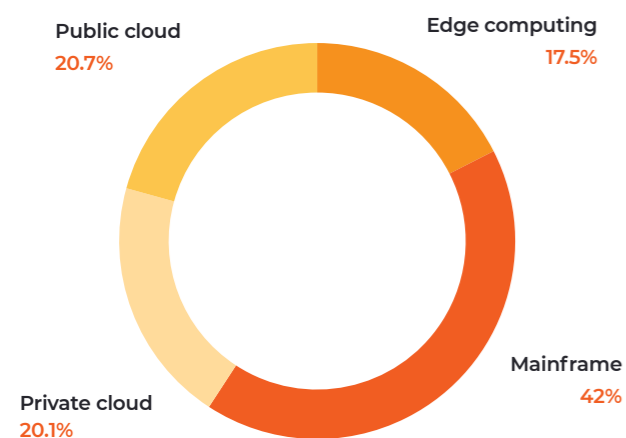
2028 projected IT estate

Public cloud 24.3%
Edge computing 20.1%
Private cloud 26.1%
Mainframe 29.6%

"Over the next five years we are strongly committed to advancing our mainframe strategy in collaboration with Google Cloud. Our goal is to modernize our mainframe systems and leverage Google Cloud's Dual Run solution to achieve greater agility, efficiency, and cost-effectiveness in our operations."

Application Manager at a large professional services business in the Netherlands

3 | Modernization drivers

MODERNIZATION DRIVERS

Increased competition within industries has everyone on edge, ranking as the factor with the most potential to negatively impact an organization (28%), even beating out the economic downturn (21%).

Competition was always a driver, but less of a priority until the pandemic forced a lot of late cloud adopters into innovative spaces, sparking a race to implement features from larger players with deeper heritage. This external pressure is driving modernization efforts aimed at making organizations more agile, scalable, and cost-efficient so they are well-positioned to gain market share.

More specifically, the top three drivers of modernization were increased agility (18%), further leveraging AI/ML for automation (16%), and addressing integration issues/technical constraints (12%). Interestingly, while AI is a top driver, it's also seen as a potential threat by some, with 18% ranking it as the development that could most adversely impact their business. This reflects the mixed views around AI over the past year as organizations grapple with how to best leverage the technology.

Sustainability is another standout driver — neither sustainability nor AI ranked as a driver in last year's report — but organizations are modernizing in new ways that align with their specific priorities and challenges. They're being more strategic in how they construct an IT landscape so they can maximize benefits while mitigating risk and balancing costs.

AI

When ChatGPT debuted in November 2022, it sparked a generative AI revolution.

The market is now crowded with other tools from Anthropic, Hugging Face, Meta, IBM, Microsoft, Google, and others, and companies are racing to adopt them. According to Deloitte's CFO Signals report, 42% of companies are experimenting with GenAI, and 15% are incorporating it into their business strategy.

Against this backdrop, our survey found that 52% of respondents say recent AI innovation has prompted an accelerated migration off the mainframe. The figure rises to nearly 70% among high-revenue firms. Another 29% are exploring how mainframes can integrate AI capabilities. No matter how it happens — on the mainframe or off — nearly everyone wants in on the AI action.

"Generative AI is set to have a huge impact on how we handle our mainframe and cloud strategies," said the CIO of a large energy company in the EMEA region. "Imagine all the manual tasks that currently take up so much time and effort becoming automated and streamlined. That's the power of AI. Plus, it's not just about making things easier; it's about making them smarter too."

That narrative seems to be pervasive, as 37% of respondents said AI and AIOps are among the top three areas of their organization receiving the most investment. The C-suite is taking a particular liking to AI — 26% of CTOs and 22% of CIOs reported AI adoption was the most important initiative for their organization — but they're taking a measured approach.

"As we embrace the impact of AI, we must exercise caution in fully entrusting it due to our handling of sensitive data. This includes crucial information such as the capacity of megawatt energy we can offer through our operations and our commitment to delivering specified quantities to government and organizational partners while accounting for unforeseen events. Consequently, we cannot place exclusive reliance on AI for managing vital information. Even if we employ it, we must maintain vigilant oversight to ensure precision in our calculations."

CIO of a large energy company in the EMEA region

Despite not ranking at all in our last report, sustainability was cited by 15% of respondents as their organization's most critical initiative.

Amid rising stakeholder focus on ESG performance, especially within the last year, it's not a shock that this would finally rise in focus after years of relative indifference to mainframes' effect on the environment. Investors, customers, regulators, and employees are all increasingly considering sustainability. According to a report by Capital Group, the global ESG adoption rate has hit 90%.

Clearly, green objectives now factor prominently into modernization roadmaps. Top goals for IT include contributing to broader green initiatives (43%), boosting reputation (38%), and improving energy efficiency (37%).

"Our commitment here is to combat climate change, promote clean energy, and manage resources sustainably," said a Project Manager of a large financial institution in the U.S. "We're determined to accelerate the adoption of cleaner energy sources and facilitate the transition to a low-carbon economy. Our ambitious goal is to invest around $1 trillion in these efforts by 2030. We're dedicated to mobilizing financial resources to advance the United Nations Sustainable Development Goals (SDGs)."

"Our mainframe modernization strategy is intended to improve energy efficiency through the optimization of hardware and processes," added an Enterprise Architect of a major American retailer. "Edge computing, which uses localized servers in stores, helps to reduce the energy consumption associated with centralized data centers."

Modernization can help achieve these goals if done thoughtfully. Migrating to the cloud can lower emissions through consolidated data centers and access to renewable energy. Cloud providers' ability to scale enables optimization. Google in particular has made sustainability a core part of its branding for cloud offerings and touts that it is 1.5x more efficient than a typical enterprise data center. But on-prem platforms like mainframes can also drive efficiency through steps like virtualization and workload consolidation.

"By upgrading our mainframe infrastructure with more energy-efficient hardware and optimizing cooling systems, we've reduced our data center's energy consumption by 20%, resulting in significant cost savings and a lower carbon footprint," said the CIO of an energy supplier in the EMEA region.

This organization isn't alone — 89% of respondents reported mainframe modernization has positively impacted sustainability goals, a 17-percentage-point increase over 2021. But there's more work to be done. With sustainability now a strategic priority, modernization plays a dual role in supporting business needs while advancing environmental objectives.
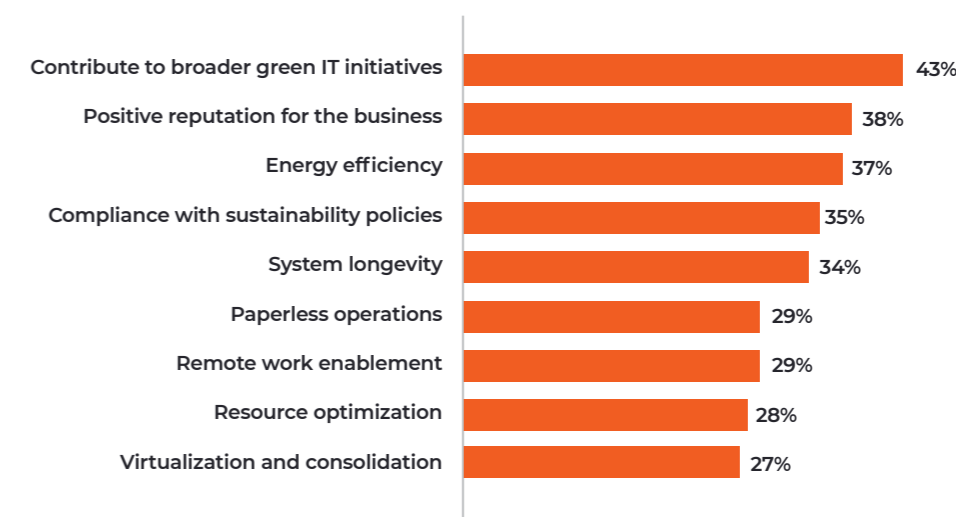
90%
of companies worldwide have adopted ESG programs (according to Capital Group)

"Our organization handles a vast amount of paperwork, ranging from incident reports and case files to administrative documents. By migrating these processes to the cloud, officers and administrative staff can create, access, and manage digital documents and data, reducing the reliance on physical paperwork. This leads to substantial cost savings and helps us mitigate our carbon footprint."

Project Manager at a government agency in Australia

Sustainability goals expected due to mainframe modernization

Contribute to broader green IT initiatives	43%
Positive reputation for the business	38%
Energy efficiency	37%
Compliance with sustainability policies	35%
System longevity	34%
Paperless operations	29%
Remote work enablement	29%
Resource optimization	28%
Virtualization and consolidation	27%

In 2022, security was the biggest modernization driver for 33% of respondents, despite mainframes' excellent reputation when it comes to security.

This year, it was cited by only 8% as the top driver and fell from first on the list to fifth. While 2022 may have been a blip on the radar for cybersecurity as a modernization driver, it's still an organizational priority.

"Enhancing cybersecurity is a continuous and non-negotiable initiative," said the CIO of a telecommunications organization in the UK. "We are vigilant in staying ahead of evolving cyber threats, bolstering our security measures, and ensuring the confidentiality and integrity of customer data."

"Mainframes excel at data encryption, both at rest and in transit. In an era where data breaches are a growing concern, the ability to encrypt data at the hardware level is a significant advantage. This level of security is essential, especially when handling sensitive customer information and financial transactions."

Another driver that decreased this year was the shrinking talent pool, a top driver for only 7% of respondents, down from 16% last year. As we cover in the next section, organizations are taking new approaches to modernizing, and they're not all dependent on a dwindling number of programmers.

Similarly, cost reduction was cited as a top driver for only 7% of respondents. While an economic downturn has affected many businesses and their outlooks, IT budgets have bucked the trend and actually grown. In July 2023, Gartner predicted IT budgets to grow 4.3% for the year to a whopping $4.7 trillion, and it projects more than double that growth, 8.8%, in 2024 to an astounding $5.1 trillion.

While the mix of drivers continues to shift, modernization must keep aligning with business goals. By maintaining this focus, organizations can navigate changing dynamics and set priorities that deliver the most value. Though the path forward isn't always straightforward, modernization remains key to staying competitive.

$5.1 trillion

Gartner's projection for global IT budgets in 2024

"We have been actively modernizing our IT infrastructure to keep up with the evolving technological landscape. As part of this modernization we have been gradually reducing our reliance on legacy systems and adopting a modern approach to our IT architecture."

Application Manager of a large professional services company in the Netherlands

4 | **Modernization strategies**

Mainframe modernization remains crucial, but it's no longer about mass migration. The rush to move workloads to the cloud has given way to more nuanced strategies aimed at balancing legacy and innovation.
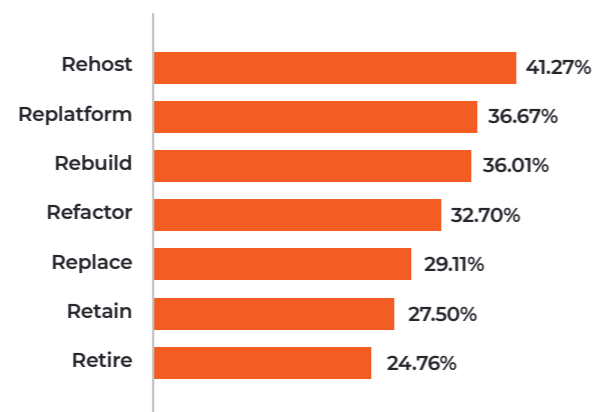
While nearly all organizations (92%) plan or have planned mainframe modernization initiatives, their goals have evolved. Rather than wholesale cloud shifts, 92% also prefer a hybrid approach. As the CIO of an energy supplier in the EMEA region put it, "We have been working on moving toward cloud services, but due to our strict privacy and security policy, we still very much prefer to keep mainframes as our primary infrastructure."

This selective focus is reflected in the numbers. The top considered initiatives are replatforming (57%), rehosting (53%) and refactoring (43%).

What's more, 53% intend to either scale mainframes to business needs or reduce their dependence on mainframes, but won't fully decommission them. High-revenue organizations are more likely to scale to the needs of the business by 16 percentage points, optimizing mainframe ROI.

On average, respondents expect to migrate 43% of workloads off mainframes eventually — a substantial amount, but not a complete exodus. The key is aligning modernization to business priorities rather than migrating for migration's sake. Blending mainframe and cloud thoughtfully allows organizations to balance innovation with resilience.

To provide clarity, we defined the following terms and the disposition strategies they represent for survey participants based on Gartner's updated guidance:

Rehost
Redeploy the application to other infrastructure (physical, virtual, or cloud) without recompiling, modifying the application code, or modifying its features and functions.

Replatform
Migrate the application to a new runtime platform. May include minimal changes to code for compatibility with new platform (e.g., to use cloud services or another DBMS), but no changes to the code structure, language, or features and functions it provides.

Refactor
Convert the application code and database(s) from one language/DBMS to another using automated tooling and operating the transformed application(s) on the mainframe or deploying to a physical, virtual, or cloud environment while retaining functional equivalence.

Rebuild
The manual transformation of the legacy code by taking the functionality of an existing application and re-writing the application in a new language.

Replace
Purchase commercial off-the-shelf (COTS) packages to take the place of applications developed and running on the mainframe.

Retire
Eliminate the mainframe entirely, inclusive of its applications and databases.

Retain
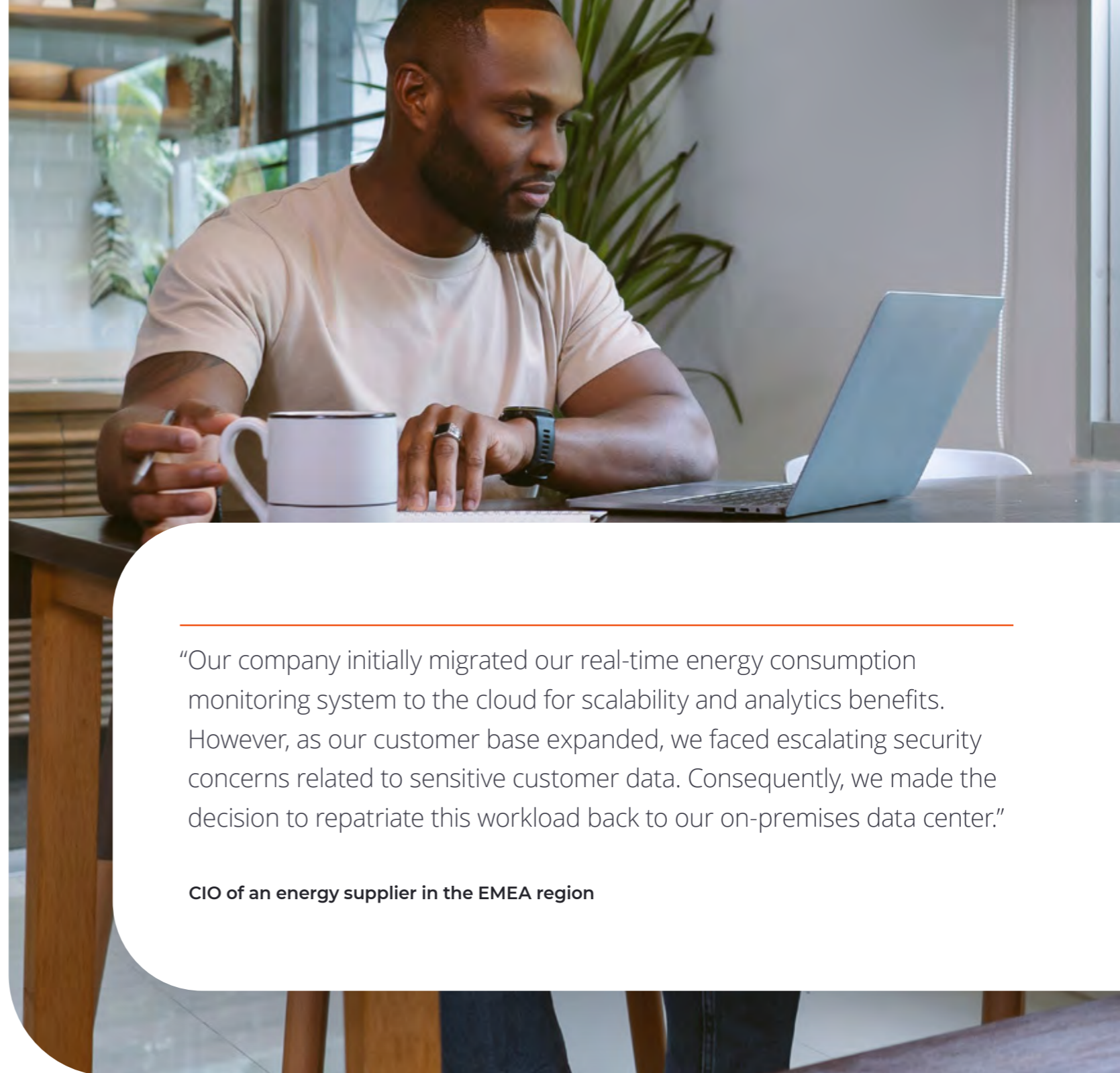Keep the mainframe and its workloads in some capacity.
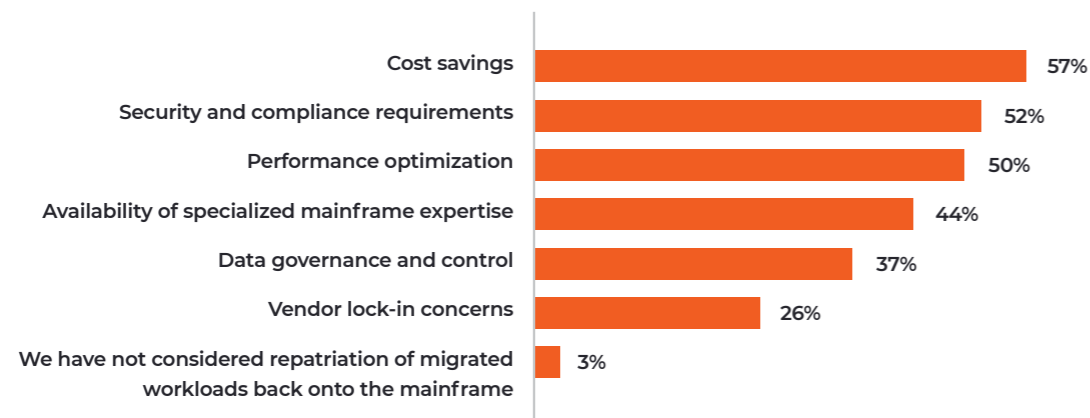
Percentage of mainframe workloads being modernized

Rehost	41.27%
Replatform	36.67%
Rebuild	36.01%
Refactor	32.70%
Replace	29.11%
Retain	27.50%
Retire	24.76%

The pandemic created an ecosystem where everything could be (and in most cases was) remote, so there was near consensus that the future was all about the cloud. Major providers cashed in — IDC reports public cloud service revenue grew 29% in 2021 to a staggering $408.6 billion.

In the rush to the cloud, many organizations failed to fully evaluate workload suitability. This led to less-than-optimal outcomes and some eventual reversals. Cost savings was the biggest factor in deciding whether to repatriate back to the mainframe, cited by 57% of respondents – a surprising stat considering the perception that mainframes are prohibitively expensive and cloud comes with a lower cost.

Security and compliance were another key consideration (52%) as was performance optimization (50%). Only 3% of respondents said they never considered repatriating.

"Our company initially migrated our real-time energy consumption monitoring system to the cloud for scalability and analytics benefits. However, as our customer base expanded, we faced escalating security concerns related to sensitive customer data. Consequently, we made the decision to repatriate this workload back to our on-premises data center."

CIO of an energy supplier in the EMEA region

Key drivers to repatriate back to the mainframe

Driver	Percentage
Cost savings	57%
Security and compliance requirements	52%
Performance optimization	50%
Availability of specialized mainframe expertise	44%
Data governance and control	37%
Vendor lock-in concerns	26%
We have not considered repatriation of migrated workloads back onto the mainframe	3%

This aligns with the 68% who see mainframes remaining a critical platform. The lesson is not that the cloud should be avoided, but that thorough analysis is required on where it makes technical and business sense. Certain workloads benefit from cloud attributes, while others are better suited to mainframe strengths. At least for now.

As a Project Manager of a large U.S. bank put it, "Whatever system currently we have on the mainframe, we want to retain it onto the mainframe only for the next couple of years. But coming back to the mainframe is not (at) all our plan."

Rather than lift-and-shift mandates, a nuanced workload-by-workload evaluation and staggered transition process help avoid costly missteps.

When undertaking modernization, organizations face a build vs. buy decision for securing necessary expertise. Some 46% of overall respondents still plan to solely leverage internal resources. That number is even higher in healthcare (61%).

This is a common misstep because while organizations may have some mainframe expertise in-house for maintenance purposes, migrating workloads requires considerably different expertise. Case in point: Only 22% of respondents who previously started a modernization project called it a success.

Partners provide specialized skills, purpose-built and proven toolsets, and bandwidth that internal teams often lack to execute modernization initiatives successfully. External experts also bring proven methodologies and best practices that ensure governance, scalability, and continuity of initiatives. For example, external expertise can assist by avoiding common pitfalls like identifying unsafe infrastructure, business continuity gaps, and opportunities for reducing MIPS.

"We don't care about having that (mainframe) expertise in-house," said a Project Manager of a small manufacturing company in the Netherlands.

"This is not our core portfolio or product. Rather than creating expertise on that, we can just offload it to people who can do it well. And having a full person, full-time on payroll, is expensive for such things. So, you pay for what you use. They do everything from implementation to full setup. If we have issues they fix it, basically they are managing everything."

Rather than reinventing the wheel, a partner can provide turnkey frameworks refined through experience from past engagements. This combination of niche talent and tested processes enables organizations to undertake modernization initiatives smoothly and minimize risk — far more easily than trying to build equivalent capabilities in-house. Tapping partners' institutional knowledge and expertise allows companies to focus on strategic goals rather than building core competencies from scratch.

Just over half of respondents plan to leverage external modernization expertise (29%), a systems integrator (14%), or a cloud provider/hyperscaler (9%).

"In our pursuit of a smooth transition and effective mainframe modernization, we recognize the value of leveraging external expertise. By collaborating with external partners who bring specialized skills and experience to the table, we aim to not only lighten the load on our internal team but also tap into a broader knowledge base. This decision allowed us to navigate the complexities of modernization with greater efficiency and confidence, ultimately enhancing our chances of success in this critical initiative."

Project Manager of a large logistics company in the APAC region

DevOps has become a major focus for mainframe modernization because it increases two coveted features: speed and agility.

According to the [2022 Accelerate State of DevOps Report](#), the best DevOps performers can deploy on-demand, multiple times per day, while low performers deploy every one to six months.

DevOps aims to break down barriers between mainframe development and operations teams through greater collaboration, automation, and continuous delivery. It represents a cultural shift as much as a technical one.

Whereas mainframe teams have traditionally operated in silos with lengthy release cycles, DevOps brings developer and operational insights together. This facilitates faster provisioning, deployment, and monitoring of mainframe applications. It enables mainframe teams to deliver improvements at the pace of business demands.

The benefits are clear — 96% of respondents reported mainframe modernization led to better awareness and integration of DevOps practices in some form, and 66% said the improvement was significant.

"We have made significant strides in integrating mainframe DevOps into our overall DevOps pipeline," said an Application Manager at a large professional services company in the Netherlands. "While it's an ongoing journey, we have achieved a level of partial integration that has already delivered tangible benefits. We have implemented continuous integration and continuous delivery (CI/CD) pipelines that incorporate mainframe development allowing us to automate the building, testing, and deployment of mainframe applications alongside our other systems."

While the payoff is significant, so are the challenges. More than half (52%) of organizations reported the biggest roadblock was limited tooling and resources for integrating mainframe systems into the DevOps pipeline. This was particularly true in the government (76%) and manufacturing (62%) sectors.

"The mainframes we use often rely on legacy technology stacks and programming languages that aren't inherently compatible with modern DevOps methodologies. Let's take an example of our core services catering to industries like finance, healthcare etc. which runs on a mainframe and uses COBOL, making automation and continuous integration complex."

**Application Manager at a large professional services company in the Netherlands**

Other challenges include difficulty aligning mainframe development processes with agile and continuous integration practices (45%), resistance from traditional mainframe teams (38%), and a lack of understanding about the benefits of mainframe DevOps (33%).

To overcome these issues, organizations should start with culture. Create an environment where cross-functional teams can work better together and automate the longest and most time-consuming processes. Getting that first positive result is a crucial proof point that reduces the intimidation of changing longstanding processes.

"We have extensively embraced DevOps practices leading to high levels of automation, streamlined processes, and a strong DevOps culture," said the CIO of a large energy supplier in the EMEA region. "This holds true for both our general IT operations and specific mainframe DevOps initiatives, ensuring maximum benefits of DevOps across all aspects of our IT environment. Although, mainframe DevOps adoption within our organization is more advanced compared to the broader IT ecosystem."

96%
of respondents reported mainframe modernization led to better awareness and integration of DevOps practices
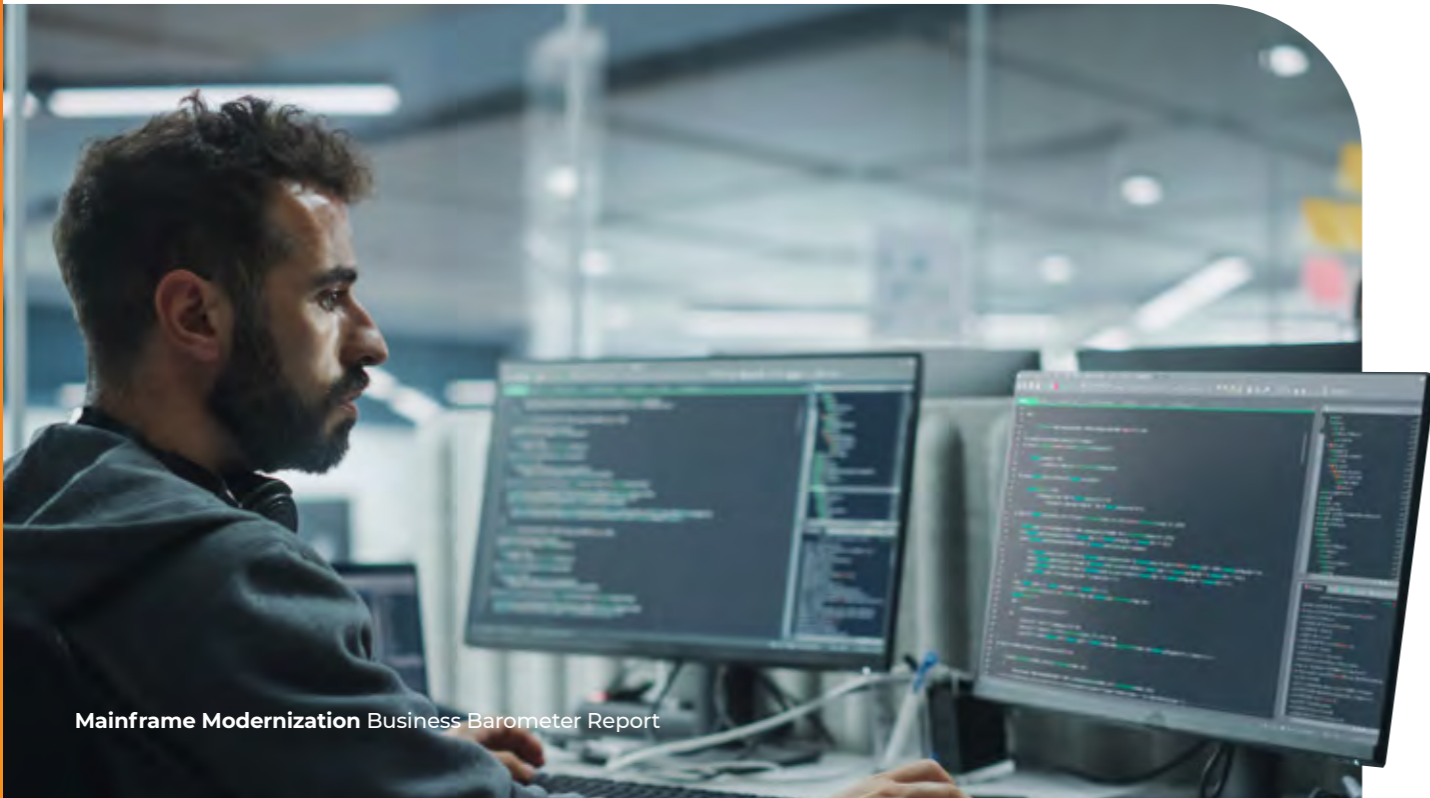
5 | Success stories

With no one-size-fits-all silver bullet for mainframe modernization, it's critical that organizations identify their priorities and then craft a plan of attack to achieve success. For some, it may be all about cost reduction; for others, maybe it's mitigated risk or improved performance.

A Project Manager at a large American financial institution reported, "A pivotal metric for us is cost reduction, where we meticulously assess the reduction in operational and maintenance costs associated with our mainframe systems. Equally crucial are our efforts to drive efficiency improvements, carefully monitoring enhancements in system performance and resource utilization. Furthermore, we keep a watchful eye on application performance, ensuring that modernized systems meet the high standards our clients expect. User satisfaction and downtime reduction are also pivotal indicators, reflecting our commitment to providing seamless and reliable services."

No matter what sector you're in, it's a tight needle to thread to achieve all your KPIs. It will require careful, thoughtful planning to arrive at the setup that works best for your organization. There is no "right" way to do it, no predetermined number of workloads you should seek to move off your mainframe.

What's important is that your modernization journey includes the foresight of potential challenges and how you might deal with them, whether that's on your own or with help from deeply experienced partners.

"The journey throughout was a good experience. Our partners made it easy for us," said the CIO of a large telecommunications firm in the UK. "In 2022, we partnered with AWS to modernize our legacy infrastructure. This worked very well, and we were able to migrate our targeted applications off of the mainframes. This also resulted in the permanent shutting down of our old data centers. This saved us millions and also reduced the burden from our head, as all the operations were handled by AWS."

Perhaps the only thing we can say with certainty about modernization efforts is that eliminating the mainframe entirely is likely a mistake. No organization in our study retired more than 60% of its mainframe workloads, let alone decommissioning the whole thing. Love them or tolerate them, mainframes are still hanging around for quite some time.

"I see mainframes being relevant in the future, even with increasing demand for cloud computing. I personally view them as strategic technology solutions for long-term survival and operations. When it comes to the finance industry, credit transactions rely heavily on mainframe systems. (I believe) mainframes are also evolving, and these systems have the ability to upgrade by means of integrating them with cloud platforms and provide scalability solutions to any business."

Project Manager at a large insurance firm in the UK

6 | About Advanced

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METHODOLOGY

The report is based on a survey of 400 executives conducted by Coleman Parkes in August and September 2023 across a variety of industries, providing unique insights into these shifts. The team spoke with leaders who serve a variety of roles — enterprise architects, CIOs, application managers, program and project managers, and CTOs. The majority of respondents were in the U.S. (74%), with 10% located in the United Kingdom, and the remaining 16% spread out across 10 countries in Europe and Asia.