

Faced with the need to navigate diverse modernization challenges and objectives, mainframe users may benefit from the specialist resources and support of a third-party solutions and services provider.

Organizations Are Modernizing Mainframe Environments to Tap Multiple Benefits

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Introduction

For many organizations, mainframe computing systems continue to be the mainstay for mission-critical workloads, relied on for their performance, reliability, and security. At the same time, a growing number of C-suite executives are recognizing the importance of modernizing their mainframe environments to ensure they are more integrated with their broader IT infrastructure footprints and application development environments.

Most mainframe users recognize that modernizing their mainframe environments can unlock multiple benefits, including lower costs, more efficient operations, enhanced integration, hybrid cloud enablement, and access to the latest cloud technologies, developer and DevOps tools.

However, mainframe users are all at very different stages in their mainframe modernization journey. Although some have already undergone a process of mainframe modernization, some have only just embarked on the modernization journey, and others are still deciding what their approach to mainframe modernization will be. Among those organizations that have yet to start modernizing their mainframe environments, some are likely to prioritize modernization initiatives in response to changing workload demands and an increasing appreciation of how improved mainframe integration can benefit an organization's wider digital transformation goals.

Approaches to mainframe modernization differ considerably and many organizations do not have a single, uniform strategy. Almost 22% of organizations say their primary modernization strategy involves upgrading their existing mainframe systems in place (see Figure 1). This means ensuring that the latest hardware and software are in place, which is essential for maximizing the latest performance and security capabilities.

A further 15% of organizations say their primary modernization strategy involves migrating existing mainframe workloads to public cloud or distributed platforms. Other primary mainframe modernization strategies include leveraging

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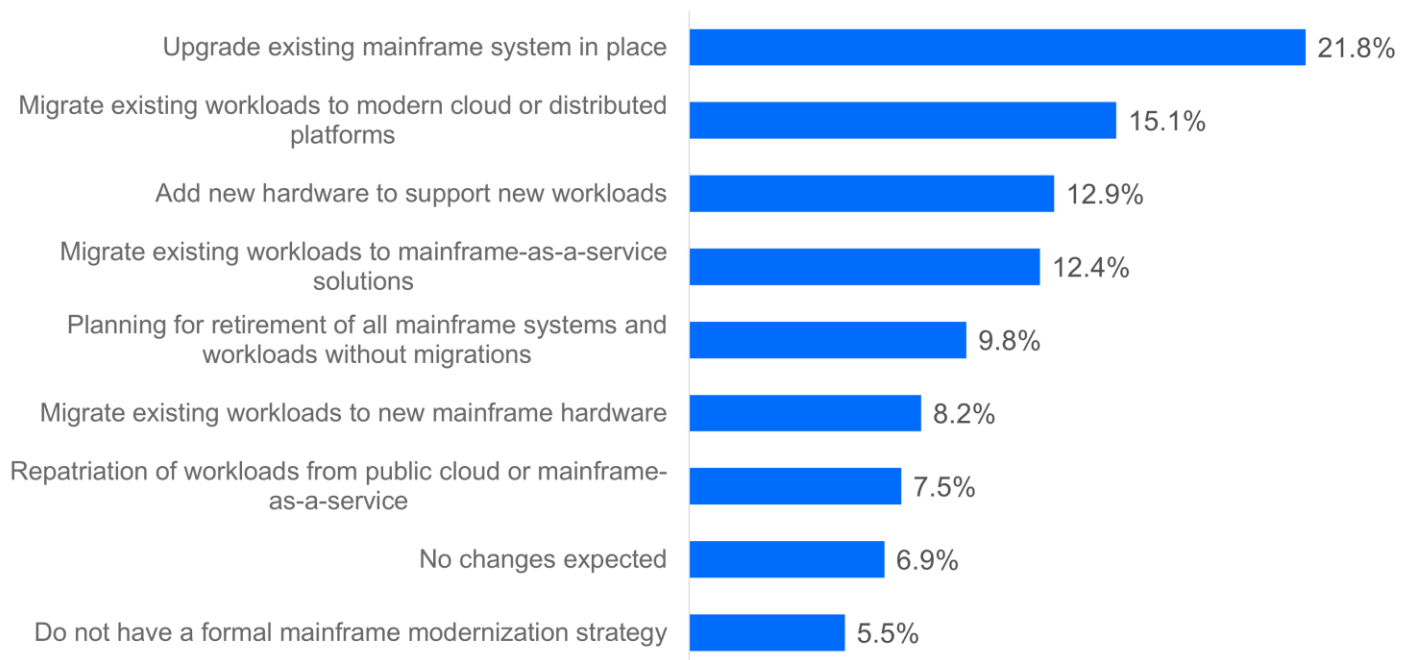
KEY STATS

- » According to IDC's 2025 *State of the Mainframe Survey*, 98% of mainframe users plan to modernize their mainframe environments over the next five years, with specific strategies ranging from upgrading their mainframe systems "in place" to leveraging mainframe-as-a-service options and migrating existing mainframe workloads to public cloud or distributed platforms.
- » 82% of mainframe users plan to significantly improve mainframe data integration for AI support over the next two years.

mainframe-as-a-service options, retiring mainframe systems and workloads, and repatriating workloads to the mainframe from public cloud and mainframe-as-a-service environments.

However, it is important to stress that, despite being able to identify a primary modernization strategy, many organizations are pursuing a combination of approaches. Many organizations that have already migrated (or which are planning to migrate) mainframe workloads to public cloud and mainframe-as-a-service environments remain committed to running core workloads on mainframe systems for the foreseeable future. For C-suite executives, this will require the prioritization of different overlapping strategies that include the optimization of mainframe systems to ensure they incorporate the latest mainframe hardware and software capabilities. It will also require them to integrate their mainframe systems with their wider IT footprints and operate those environments in a hybrid manner. An integrated and hybrid approach to mainframe modernization necessitates an adequate and holistic approach to mainframe environment management, one which maximizes efficiency, agility, cost-effectiveness, and ROI.

FIGURE 1: **Primary Mainframe Modernization Strategies over the Next Five Years**



Source: State of the Mainframe Survey, IDC, April 2025

Mainframe Modernization Benefits and Drivers

Organizations have a wide range of priorities and objectives which underpin and drive their mainframe modernization strategies (see Figure 2). These include the desire to achieve better integration between mainframe workloads and applications running in cloud and distributed environments. They also include ensuring that all necessary mainframe data privacy, residency, and compliance requirements are maintained, avoiding and mitigating cybersecurity risks, supporting sustainability goals, and reducing the cost and complexity related to mainframe app development and management.

For many organizations, the incorporation of their mainframe environments into their broader AI strategy is an important C-suite priority that is driving their mainframe modernization goals. IDC research shows that AI is emerging as a top

strategic workload, driving new interest in mainframe modernization, data integration, security, and scale. According to IDC's 2025 *State of the Mainframe Survey*, 82% of mainframe users plan to significantly improve mainframe data integration for AI support over the next two years. A growing number of organizations recognize the potential for AI to help them simplify access to trapped business logic and data stored on the mainframe. It can also help them accelerate the development and deployment of applications and services. At the same time, organizations identify a host of challenges that need to be addressed if they are to succeed. These include security concerns, compliance requirements, skills limitations, and the absence of processes and systems to prepare mainframe data and ensure mainframe data quality for AI use.

FIGURE 2: **Top 3 Priorities Driving Mainframe Modernization Strategies**



Source: *State of the Mainframe Survey, IDC, April 2025*

Organizations also identify multiple challenges which have the potential to hinder their mainframe modernization strategies generally. The biggest challenges include cybersecurity, regulatory, and compliance commitments/requirements, and the costs associated with moving data between different platforms. They also include lack of funding and the absence of appropriate or requisite skills, a lack of executive support and/or prioritization, and cultural resistance to change within the organization. To help them navigate these challenges and ensure success with their modernization objectives, organizations may benefit from the specialist resources and support that a third-party solutions and services provider can provide.

Cognizant’s Approach to Mainframe Modernization

Cognizant offers a wide range of mainframe modernization services that have been developed to help organizations transform and optimize their legacy mainframe environments. Cognizant’s mainframe services include support for

specific modernization strategies, help with the migration of mainframe workloads to cloud and distributed platforms, and the provision of mainframe management and optimization tools.

Cognizant's mainframe modernization strategy leverages specific platforms and services such as Skygrade, Flowsource, and Zero Deviation LifeCycle (ZDLC), and technology partnerships with technology and solution providers including IBM:

- » **Skygrade** — A key component of Cognizant's suite of services to help organizations transition to modern, cloud-native architectures, Skygrade uses AI and automation to accelerate the modernization and migration of mainframe applications to the cloud. It also helps customers manage their on-premises infrastructure, including edge locations, as part of hybrid, multicloud environments.
- » **Flowsource** — A generative AI-based (GenAI) solution, Flowsource is designed to help mainframe customers streamline their entire software development life cycle by automating and integrating various stages of the life-cycle process. Key objectives include enhanced quality and control (including security and compliance), increased cross-team productivity, and accelerated software development and time to market.
- » **KDLC** — Helps mainframe users automate the process of extracting knowledge from mainframe applications. Key benefits include more efficient and less costly application development processes, and the ability to modernize complex mainframe applications, including those written in COBOL.
- » **IBM** — Cognizant and IBM provide mainframe users a broad set of solutions to support mainframe modernization objectives. Cognizant brings its consulting, implementation, and management expertise to the partnership to help customers deploy IBM's mainframe technologies, including those that aim to integrate mainframes with AI and hybrid cloud environments.

Cognizant's approach to mainframe modernization is intended to help organizations enhance operational efficiency, reduce operational and management costs, and increase the efficiency and agility of their mainframe environments, by enabling them to re-architect monolithic systems and applications into more flexible, integrated, and hybrid environments. Cognizant's portfolio of mainframe modernization tools is also designed to help mainframe users innovate and transform with the help of AI.

How Cognizant and IBM Enable Mainframe Modernization Goals

Cognizant and IBM have a strategic alliance that spans over 20 years and which aims to help their customers drive innovation and expand to new markets while also reducing costs. Through its collaboration with IBM, Cognizant is able to offer solutions that harness IBM's diverse portfolio of solutions — from AI and automation to hybrid cloud, FinOps, and cybersecurity. The Cognizant-IBM alliance leverages a range of delivery models that include resale, co-selling, and the provision of managed services.

In their approach to mainframe modernization, Cognizant and IBM leverage a range of technologies and fields of expertise to help customers with their modernization goals. Areas of focus include:

- » **Modern IT architectures** — A key solution for helping mainframe organizations adopt modern IT environments is IBM's z/OS, the flagship operating system for IBM Z mainframe environments. Using tools such as z/OS Connect, mainframe customers can modernize core mainframe applications, by exposing z/OS applications as RESTful APIs and allowing z/OS applications to call external RESTful APIs. This allows mainframe users to integrate mainframe

applications with cloud and other environments without the need to change their underlying code. Cognizant offers a range of professional and managed services to help mainframe customers deploy and effectively take advantage of IBM's z/OS solutions. Other tools to help mainframe organizations transition to modern IT environments include AI-based solutions such as IBM watsonx Code Assistant for Z. In addition, tools from Red Hat, including Red Hat Ansible Certified Content for IBM Z, are intended to help customers automate mainframe tasks and integrate z/OS into their wider automation strategy.

- » **Modernization with AI** — Cognizant and IBM help organizations integrate AI tools and capabilities into their mainframe operations and modernization strategies, with specific goals including more efficient mainframe operations, reduced costs, and the ability to unlock the value of their mainframe data resources. Key technologies include IBM's watsonx Code Assistant for Z, which helps mainframe customers analyze, document, and translate legacy COBOL code into modern languages such as Java. Cognizant and IBM are also committed to AI governance, with IBM's watsonx.governance tools helping customers ensure that the use of AI in conjunction with their mainframe environments is fair, transparent, and compliant with regulations. AI is also central to Cognizant and IBM's collaboration on intelligent finances and IT operations management. Specifically, Cognizant has integrated IBM's Apptio and Turbonomic software with its own service offerings, which give mainframe customers enhanced visibility into their IT investment and consumption costs, and the increased use of automated processes.
- » **Hybrid cloud adoption** — Joint solutions from Cognizant and IBM help customers with their hybrid cloud adoption goals, including the operation of mainframe systems as part of hybrid cloud environments. Cognizant offers customers extensive planning, design, and cloud migration services and integrates IBM technologies with its own solutions (including Skygrade and Flowsource) to help customers manage and optimize hybrid cloud environments. For example, Cognizant's Skygrade multicloud management platform integrates IBM Apptio, Turbonomic, and watsonx Code Assistant for Z to provide customers with a unified approach to managing and governing hybrid IT assets. Also, by leveraging the open source capabilities of Red Hat OpenShift, mainframe customers can operate the same software stack across public cloud, private cloud, and on-premises infrastructure, including mainframes. Meanwhile, IBM's Apptio software leverages GenAI and machine learning capabilities to provide customers with insights into their cloud consumption costs, helping them optimize usage and eliminate waste across hybrid and multicloud environments.
- » **Modern app development** — Cognizant and IBM help mainframe customers implement tools and practices for modern application development. These include Cognizant's GenAI-based tool, Flowsource, which helps organizations streamline the software development life cycle and enhance app development efficiency and innovation. Flowsource integrates IBM watsonx Code Assistant for Z and IBM's Apptio and Turbonomic software which equip customers with additional tools and capabilities for modernizing mainframe application environments. IBM Developer for z/OS Enterprise Edition (IDzEE) is a set of tools for developing and running applications on IBM z/OS systems, as well as supporting modern DevOps practices. It includes advanced debugging, support for languages like COBOL and PL/I, and various automation tools, and is designed to enable modern CI/CD pipelines. Cognizant leverages IDzEE as part of its own support for mainframe customers looking to modernize their DevOps and application development environments.

Challenges

- » **Intensively competitive market** — Cognizant operates in an intensively competitive market, with other major global IT service providers also targeting mainframe modernization needs and opportunities. Competitors include Infosys, DXC Technology, Kyndryl, Capgemini, and Wipro. Many of these providers also have strategic partnerships with IBM and have stepped up their focus on applying and integrating AI capabilities to mainframe environments. The challenge for Cognizant will be to differentiate its portfolio, value proposition, and brand recognition in an already busy and dynamic market.
- » **Addressing modernization barriers** — Mainframe users identify various concerns and barriers that hinder their ability to successfully modernize their mainframe environments. These include compliance, regulatory and cybersecurity requirements, skills gaps, lack of executive support and a clear business case for modernizing, and concerns about the potential cost and complexity of modernization projects, and the high risk of business disruption. Whether perceived or real, these concerns frequently result in modernization initiatives becoming delayed/postponed and present real challenges that service providers such as Cognizant need to address.
- » **Support for “in-place” modernization** — 22% of mainframe users say their primary mainframe modernization strategy involves upgrading their existing mainframe systems in place, while a further 13% say their primary strategy is to add new hardware to support changing workload requirements. As part of its competitive strategy, Cognizant needs to counter market perceptions that its main focus involves helping organizations move off the mainframe, and to demonstrate that it also offers extensive modernization support for “in-place” mainframe modernization efforts.
- » **Mainframe and AI adoption challenges** — An important aspect of Cognizant and IBM’s joint approach to mainframe modernization involves demonstrating the value of applying AI tools and capabilities to mainframe systems, applications, and data. However, despite widespread and growing engagement with AI, mainframe users still express concerns about adopting and deepening their use of AI that Cognizant and IBM will need to address going forward. These include data privacy, security, and privacy constraints, a lack of necessary skills and a mainframe modernization road map for AI, and environmental hurdles, including networking costs and challenges.

Conclusion

Mainframe users are at various stages in the mainframe modernization journey, and although most organizations can identify a primary modernization strategy, many are simultaneously pursuing a combination of approaches. As they strive to achieve a range of modernization goals, C-suite executives have to balance different overlapping strategies and priorities. Increasingly, mainframe organizations need to be able to operate their mainframes as part of a wider, hybrid IT footprint that includes use of public and private cloud environments. Over the next few years, many organizations also plan to significantly integrate their mainframe environments with different AI tools and capabilities in order to unlock a breadth of objectives. However, mainframe users also identify various challenges which they see as a potential hindrance to their ability to modernize successfully and take advantage of new AI capabilities. These include concerns about the potential cost and complexity of modernization projects, a lack of necessary skills, and the high risk of possible business disruption.

Faced with the need to navigate these diverse challenges and achieve success with their modernization objectives, many mainframe users may benefit from the specialist resources and support that a third-party solutions and services provider can provide. Cognizant offers an extensive portfolio of mainframe modernization services that are designed to help organizations transform and optimize their legacy mainframe environments. Cognizant can support a breadth of mainframe modernization strategies that range from helping organizations modernize mainframe workloads “in place” to leveraging diverse mainframe management and optimization tools, and migrating mainframe workloads to cloud and distributed platforms. Through their long-standing partnership with IBM, Cognizant is able to offer solutions that harness IBM’s diverse portfolio of solutions for IBM Z customers, which include tools and capabilities for enabling modern IT and hybrid cloud environments, applying and integrating AI technologies to mainframe environments, and implementing practices for modern application development on the mainframe. Together, Cognizant and IBM are well-positioned to help mainframe customers achieve a wide range of modernization objectives that can help them maximize efficiency, agility, cost-effectiveness, and ROI. However, they must also address and help mainframe organizations navigate various challenges, including the need to challenge market perceptions about the cost and complexity of modernization projects, and tackle concerns about the ability to successfully integrate mainframe environments with emerging AI technologies.

Together with IBM, Cognizant offers an extensive range of modernization services that are designed to help IBM Z users transform, modernize, and optimize their mainframe environments.

About the Analyst



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Chris Drake is Senior Research Director within IDC's worldwide infrastructure research organization and part of the compute infrastructure and service provider trends practice. As part of the compute infrastructure research, Chris covers key trends in the computing systems, platforms, and technologies markets. These encompass high-end, accelerated, in-memory and heterogeneous computing infrastructure systems, platforms, and technologies, and include servers with discrete and embedded accelerators (e.g., GPUs, FPGAs, and ASICs) deployed in the cloud, at the core, and at the edge. Chris's research spans mission-critical computing platforms, mainframes, and RISC-based systems as well as their associated operating environments (e.g., Linux, z/OS, UNIX).

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