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AI-first for Mainframe Modernization

How Generative AI provides a way out from legacy application constraint and stagnation on the mainframe

Mainframes are still highly prevalent across the global economy

Mainframe systems are at the heart of our economy - they manage our bank accounts, our insurance policies, put food on the shelves of our supermarkets and keep our essential infrastructure running. They are reliable, secure and scalable, and have been serving us for decades.

According to a recent IBM report[1], 45 of the top 50 banks, 4 of the top 5 airlines, 7 of the top global retailers, and 67 of the Fortune 100 companies rely on mainframes as their core platform.

Mainframes have a proven capability to manage scalability, security and resilience, making them a good fit for transaction processing, financial systems and record keeping.

However..

Legacy mainframe applications were not built to meet the needs of modern business

Most mainframe applications are built on aging technology (such as COBOL) that does not meet modern business needs for digital innovation, business agility and cost efficiency.

Key issues

- Manual, inflexible business processes
- System complexity
- Declining pools of expertise
- Lack of documentation
- Niche technologies
- Inefficient technology operations
- Lack of integrated management visibility
- Stranded data assets
- Release management integration
- Vendor lock-in
- Difficulty accessing from digital channels
- Maintaining regulatory compliance

An IBM study showed that **mainframes handle almost 70% of the world's production IT workloads**.

Mainframe modernization efforts in the past have faced challenges

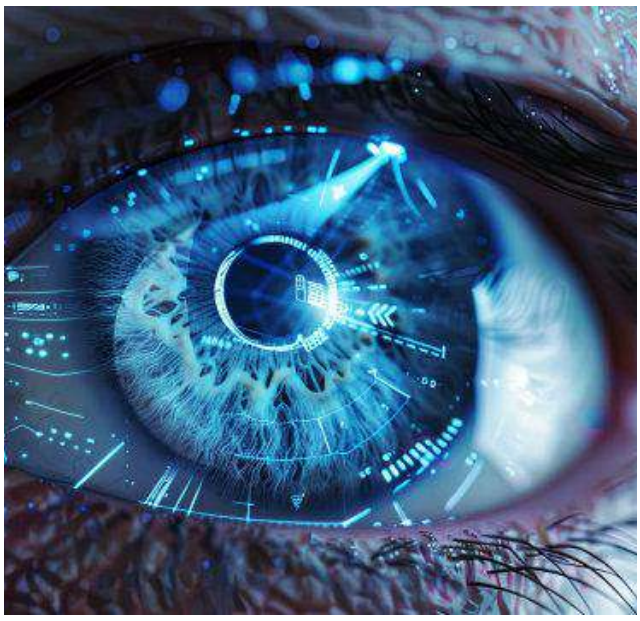
Ideally, we could modernize mainframe applications so that they accelerate, rather than hold back, business change.

But mainframes are complex systems that have been built up progressively over many years.

Modernization teams have struggled to fully understand the current state of applications. Due to gaps in understanding, teams were unable to effectively manage change impacts and transition risks.

These factors resulted in high modernization costs, or sub-optimal modernizations that re-create legacy on a new tech stack.

Now, generative AI is removing the barriers..



[1] *Source: https://www.ibm.com/topics/mainframe*

Generative AI changes what's possible and can increase modernization velocity by up to 70%

Thanks to revolutionary new capabilities, Generative AI creates completely new possibilities for mainframe modernization and puts a modern core within reach. Gen AI techniques are highly applicable across the entire modernization journey.

Modernization scenario	Optimize current mainframe systems	Migrate applications to a cloud-native architecture	Build next-generation replacement solutions
Generative AI accelerators	• Understand legacy code • Modern code on mainframe • SRE & Alops practices • SDET & Ops automation practices	• Reverse engineering current apps • Forward engineering refactored apps • Co-existence enablement • Cloud deployment	• Legacy app translation to specification • Modern code generation • Test case generation • Documentation generation
Outcomes	**Reduce operations costs and unlock budgets to self fund innovation**	**Migrate apps to the cloud to improve agility, performance & security**	**New experiences and re-imagined processes exploiting emerging tech**

Optimizing on the mainframe

Rapid results can be realized using Gen AI to address productivity, risk, and complexity within the mainframe environment.

Focusing on these opportunities in the short term can also free up capacity to re-invest into more transformational modernization activities.

Gen AI tools now make possible:

1. Legacy Understanding. Existing applications can be reverse engineered to fill documentation gaps, interactively explain specific code, and extract business rules.

2. Language translation. COBOL can be translated to modern languages such as Java. Unlike previous translation techniques, Gen AI creates flexible "modern" Java and not just COBOL code re-written in Java syntax.

3. Modern Engineering. New requirements can be implemented in Java using modern DevSecOps practices. Within this context, Gen AI can accelerate new development, increasing productivity.

Modernizing to cloud

Gen AI can also de-risk and accelerate the migration of mainframe workloads onto cloud platforms.

Depending on technical complexity and business value, three major modernization approaches are applicable.

Gen AI tools now make possible:

1. Rebuild. Many applications can be migrated to Commercial, Off-The-Shelf (COTS) solutions. In this scenario, Gen AI can understand existing business logic and generate specifications for parity in new implementations.

2. Refactor. Legacy code can be re-factored to modern languages with Gen AI, and then additionally re-factored to run effectively on the cloud (e.g. containerization).

3. Rehost. Stable applications that need to migrate to either decommission hardware, or co-exist with other apps, can run on virtual mainframe environments. AI can assist in identifying dependencies and integration points for clean scoping.

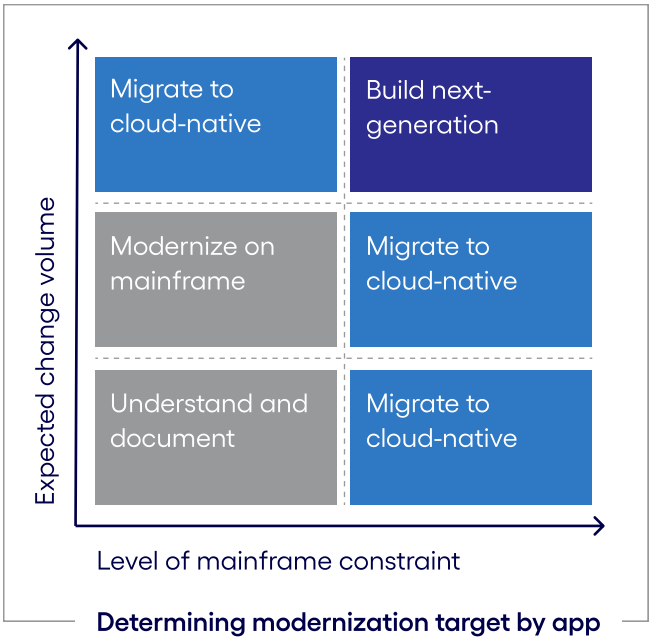
Optimize for business benefit

To maximize the value of modernization activity, different strategies should be adopted for different applications.

Infrequently changing applications that are not constraining the business will benefit most from automation and platform optimization and will likely not justify more invasive modernization.

Applications that are functionally fit for purpose but are creating significant business constraint should be a focus for technical refactoring.

Applications that offer insufficient functionality or ineffective experiences should be a focus for business-led re-implementation.



Determining modernization target by app

Sequence for self-funding

In capital-constrained environments, there are opportunities to sequence modernization to subsidize development activities through savings in operations costs.

Operations automation, infrastructure right-sizing and developer productivity acceleration are all high-priority early-stage activities that create headroom to re-invest in modernization. For this reason, having a partner that handles operations, modernization and new development within a single delivery organization enables much more efficient re-balancing of focus as efficiencies increase.

Accelerate with AI and Automation

All stages of modernization can be enhanced by adopting a range of Gen AI, AI and automation tooling, including:

- Analysis and **understanding of legacy** environments
- Translating and **re-factoring legacy** code into modern code
- Acceleration of **new code development**
- Automation of **DevSecOps** and **production operations**

Case Study

Building a best-in-class scalable order management platform for a North American retailer

The client had a large footprint of legacy mainframe applications that was misaligned to their vision, constraining change, and undermining customer experience.

Cognizant re-engineered the order-management system within Google Cloud Platform using a modern architecture and consolidating across lines of business.

Modernization of **5M lines of code** was successful and **now processes over $10B of annual digital sales**. The modernized solution enables new marketplace and partnership capabilities. The new cloud platform greatly enhances business agility with auto-scaling, self-heal and zero-trust security capabilities.

Partnering with Cognizant

Cognizant will partner to deliver your outcomes

Cognizant has all the capabilities needed to drive end-to-end core modernization. We have already assisted over 500 clients on their mainframe journey and can draw on the capabilities of over 10,000 mainframe application services professionals.

What's unique about Cognizant:

- We combine end-to-end consulting, development, and operations enabling us to modernize in-flight and **seamlessly re-invest efficiency savings into modernization**
- We take an AI and automation-first approach throughout and integrate **cutting edge Gen AI capabilities** at every stage
- We operate with a **flexible approach and domain specialization** that is focused on delivering the best business outcomes for each client

Our platforms

Cognizant's platforms take the best capabilities available in the market, pre-integrate them and then add accelerators.

Flowsource is our platform for augmented engineering that brings together developer workflow, code generation and DevSecOps into an integrated system of work. Flowsource can accelerate new modern engineering development in a way that is transparent, risk managed, and sustainable.

Skygrade accelerates cloud modernization and enables effective multi-cloud management. Skygrade includes AI-powered tooling to analyse legacy applications, define code dependencies, re-factor code, re-platform code and range of other tasks to de-risk and simplify modernization.

Neuro provides autonomous operations capabilities to monitor production environments, use AI to determine root causes of issues and self-heal incidents. Neuro can enable operations cost reduction to fund modernization and can also de-risk the transition period of mainframe modernization programs.

Our partnerships

Our partnerships all include aligned methods and integrated tooling across mainframe, private cloud and public cloud tech stacks.

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