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Retiring the mainframe

The path to IT modernization and competitiveness



This executive summary highlights CGI's successful approach to retiring mainframes and illustrates the striking outcomes.

The death of the mainframe has been heralded several times and several times postponed.

CGI's experience demonstrates that retiring the mainframe platform can save up to 90% of its associated operating expenses, reduce time for competitive upgrades and more.

Yet, a mix of inertia and misunderstanding of what it takes to realize these savings causes businesses to waste precious

resources to maintain obsolete technologies, impeding their competitiveness.

Today's modernization paths enable businesses to keep all of their applications intact and can trigger the simplification of the legacy portfolio – all without investing a single dollar to fund the adoption of a far more competitive platform.

Is this too good to be true?

A brief history of mainframes

During the early years of the computer industry (1950s to 1970s), several manufacturers produced mainframes, but, despite many mergers and acquisitions, the mainframe market has always been dominated by IBM. In the 80s, the market faced tremendous pressure as mini-computers started to perform the same tasks at a fraction of the cost, and terminals began to be replaced by PCs.

The growth of e-business dramatically increased the number of back-end transactions and the size and throughput of databases, providing a second breath of life for mainframes.

Mainframe providers have tried to increase their hold on the market by bundling and integrating mainframe hardware and software. By increasing the weight of software in the mix and refusing to license software to other makers, IBM in particular has become a de facto monopoly in many regions, with more than 90% of market share.

This has allowed mainframe providers to increase prices despite declining demand in opposition to what's happening in the rest of the computer industry (Moore's Law). For example, for a given upgrade of mainframe memory, a company will pay up to 60 times more for an upgrade in an open system environment and, even though mainframe components are built to be more resilient, such a difference has a direct impact on a company's competitiveness.



Overcoming the handicaps



“Mainframe” is the name chosen in the sixties to label large systems designed to host core applications and bulk data processing for corporations and government organizations. This class of equipment was designed to handle high volumes of transactions, enable the hot-swapping of system capacity without disrupting its functioning, tolerate faults, and support high I/O throughput by using specialized dedicated processors.

Based on this legacy, a significant portion of today's transactions is still processed by mainframes. Yet, unlike in the beginning of the computer era, big businesses no longer require mainframes to handle large volumes of data quickly and accurately. Today, the largest transactional systems in the world don't run on mainframes. Leaders such as Apple and its iTunes and Apps stores, Facebook, Amazon, Google and most leading telecommunications companies and retailers no longer operate mainframes.

Most importantly, new competitors across all sectors of the economy are challenging incumbents without the handicaps of old mainframe technologies, and therefore benefitting from radically lower costs and far faster response times in launching new service offerings.

But, if mainframes are such expensive and complex computing devices, why are they still used when much better and cheaper alternatives exist? In reality, every new business, and large ones in particular, don't use mainframes.

Our experience demonstrates that retiring the mainframe platform can save up to 90% of its associated operating expenses, reduce time for competitive upgrades and more. CGI has helped clients reduce infrastructure and application maintenance platform costs from 50-70% and to redeploy 30-50% of resources towards innovation projects.

Apart from being locked into a single provider, organizations still dependent on mainframes face four increasing handicaps:

- **Slow time-to-market:** Launching new services takes too long and responding to competitors' new services can be a nightmare.
- **Rapidly aging skill pools:** Many mainframe vendors have closed shop or stopped supporting their old platforms, putting business continuity at risk.
- **Lack of access to best-in-class software:** Such software is no longer being developed for the mainframe (e.g., CRM, Liferay, etc.).

- **High maintenance costs:** With additional CPU capacity and memory priced at a premium and business rules hard coded, making changes is costly and time-consuming.

CGI addresses the complexity and the highly integrated nature of mainframe applications by maintaining their integrity, minimizing recoding, and retaining functionality while adopting a state-of-the-art system landscape.

Mainframe modernization

CGI's modernization approach migrates mainframe-based applications to open and cost-effective Unix and Linux-based platforms and has generated the following benefits for our clients:

- Reduced infrastructure and application maintenance platform costs from 70% to less than 50%
- Redeployment of resources towards innovation from 30% to more than 50%

Our track record reveals an extremely compelling business case. A typical modernization project involves the following economics:

- The annual cost per MIPS ranges from \$2,000 to \$5,000 (€1,500 to €4,000).
- Depending on the complexity of the mainframe technologies involved, a migration project costs approximately the same as one year of maintenance.
- Resulting ongoing system maintenance costs are around 20% of mainframe costs.

The below chart provides high-level savings estimates for how for a modernization project involving a midsize mainframe (4,000 MIPS) delivers benefits.

Mainframe cost	\$6 to \$16million/year
Migration project	\$8 to 10million (one time)
New system cost	\$1.5 to \$2.5million/year
Project payback	9 to 12 months
Savings	Approximately \$8 million/year



A fully funded alternative



CGI believes in sharing risks and rewards equitably and can leverage its strong balance sheet to fully underwrite the migration and modernization process. For example, for the same midsize mainframe (4,000 MIPS), financing the modernization project and mainframe operation with a five-year loan at 6% interest rate would generate the following results:

Mainframe cost \$10 million/year

	Years 1 to 5	Years 6 to 10
New system cost	\$7.7million/year	\$6million/year
Savings	\$2.3 million/year	\$4 million/year

“With the mainframe re-hosting, we cut annual operating costs by 95 percent, while providing new functionality to better serve our constituents. Now we have a consolidated, flexible foundation to quickly respond to market change and future integration requirements.”




Dr. Carlos Brito, CIO,

Instituto das Tecnologias de Informação na Justiça

CGI's IT Modernization Global Competence Center

CGI's IT Modernization Global Competence Center encompasses a specialized team of highly competent and experienced professionals whose main goal is to align a client's vision and goals with the evolution of its IT infrastructure.

We have honed a proprietary process and tools—the M8 (Modernization Automated Tools Environment)—to help clients address mainframe handicaps and migrate to cost effective, flexible platforms with little risk to their business processes, often within 6 to 12 months. Our approach has three steps that enable our clients to maintain full control of the process and associated decision-making:

-  The completion of a questionnaire to obtain a quick overview of the project's scope, potential benefits, critical steps and risk mitigation.
-  The execution of an in-depth, structured assessment to gain a clear picture of the necessary work and engage in a dialogue with the client on the options at hand. Through this process, the best option is selected in light of the specific circumstances and upside.
-  A migration implementation project is then initiated to re-host the mainframe application(s) on Unix or Windows-based platforms.

The following options or combinations are typically considered:

Convert:

Automatically convert 4GLs, COBOL or PL/I language into Java, C/C++, etc.

Re-write:

Recover content by recycling business rules, mining models and forward engineering

Replace:

Replace applications with custom or packaged solutions and enable SaaS and other cloud technologies

CGI's M8 approach automatically gathers and analyzes data about legacy applications by creating complex queries for the source code and building a clear picture based on dependencies and interdependencies. These same tools also can be used during the migration project to automate conversion steps and to test comparison activities.

CGI's transformation approach is agile and uses live production data, and our IT modernization proposition and delivery is based on a repeatable, proven solution. We provide mainframe and target system technologies, a variety of target infrastructure configuration and administration services, data expertise at the DBA level (e.g., DB2, CDC, Oracle, GoldenGate, etc.), systems architecture design (mapping source to target technologies), and automated software conversion, development and testing.

CASE STUDY

Portugal Ministry of Justice

Among European governments, the Portuguese government has faced some of the most extreme budgetary pressures requiring it to re-think most of its processes, including its IT infrastructure.

CGI has helped the country's Ministry of Justice reduce operating costs by retiring its 250 MIPS mainframe. The migration was executed without impacting its 24x7 IMS applications, accessed by thousands of users around the world.

CGI deliverables

The migration was carried out in seven months by a combined team of CGI, its partners and client staff.

A target platform was established on servers running Linux. DBDs, PSBs and copybooks were parsed, and missing and duplicate information was identified. The application and data migration process was completed on time and on budget. All transaction processing capabilities, communication functionality, screens and hierarchical data were deployed on the open system with no disruption to end users. The hierarchical IMS data was moved into a flexible relational database. All existing user interfaces were retained, making migration invisible to end users and requiring no end-user training.



Benefits

Operating costs were reduced by 95%, and current productivity is much higher. The Ministry now operates a flexible IT environment that enables a far more efficient roadmap for application development.

CASE STUDY

Leading pension funds in the Netherlands

A leading Dutch pension fund was looking for ways to eliminate its dependency on a single provider and increase its service innovation and time-to-market for new services.

CGI was selected to migrate the pension fund's mainframe applications to a Unix platform, reducing costs by more than two thirds, while increasing flexibility and improving service levels. Today, the pension fund is vendor-independent and able to more quickly adopt cost-effective technologies that are better aligned with its business requirements.

CGI deliverables

CGI delivered a turnkey migration without changing a single application. The team deployed proprietary software that enables the running of the original applications in a Unix environment. It also configured the environment, converted all data, tested end-to-end processes, and trained operational staff.



Benefits

The bottom line impact was immediate. A multi-million euro tab was reduced to a fraction of this amount, providing a financial payback within a year. All relevant source code, including JCL scripts, was adapted to run on Unix environments. In addition, all data stored in DB2 database and mainframe files was converted and transferred to Oracle DB in the Unix environment and throughput time for batch processing was shortened by a factor of three.

The savings were redeployed to accelerate critical customer front-end projects within the same budget envelope.

Furthermore, the migration was delivered on time and on budget, with no unplanned service interruption.

Through our proven approach, CGI helps clients reduce operating expenses, freeing those dollars achieve top-to-bottom-line results.



About CGI

Insights you can act on

Founded in 1976, CGI is among the largest IT and business consulting services firms in the world.

We are insights-driven and outcomes-based to help accelerate returns on your investments. Across hundreds of locations worldwide, we provide comprehensive, scalable and sustainable IT and business consulting services that are informed globally and delivered locally.

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