
# Mainframe Excellence 2025

## A Generational Call for Strategic Platform Stewardship

Compuware

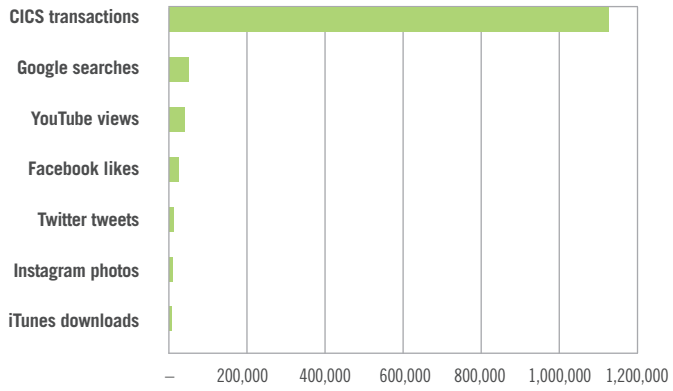
## A GENERATIONAL CALL

A changing of the guard is taking place in enterprise IT. A new generation of IT leaders is assuming responsibility for guiding their organizations to success in tomorrow's increasingly tech-centric digital markets. And, having forged their careers through a period of intensive technological innovation, these leaders are by and large very well-prepared to do so.

Many of these next-generation IT leaders, however, have had relatively little opportunity to gain experience exercising appropriate stewardship over what remains the single most important IT asset at most global enterprises: the mainframe.

This is a serious issue. Despite rumors to the contrary, the world still runs on mainframes. More than 220 billion lines of mainframe application code are in use today, and five billion more are added every year. Over 1.15 million CICS transactions are executed on System z every second of every day. That's more than all Google searches, YouTube views, Facebook likes and Twitter tweets combined.

### Transactions per second by platform



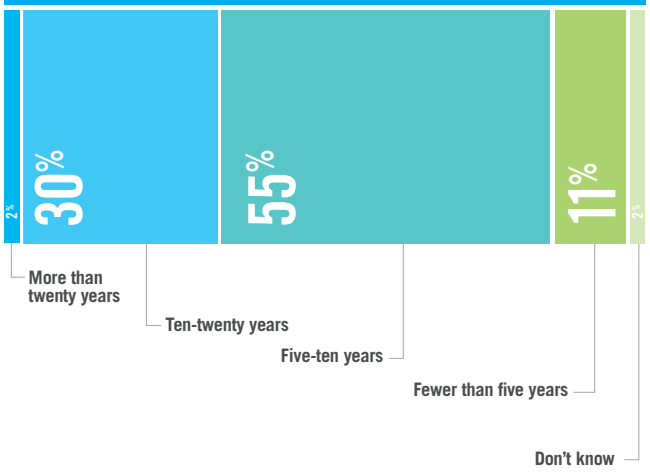

**The volume of CICS transactions alone handled by the world's mainframes dwarfs the combined scale of today's heavily hyped web/mobile services.**

*Source: ibm.com/developerworks*

And the mainframe cannot be simply imagined away. Studies confirm that most large enterprises expect to continue relying on their mainframes for at least another ten years—and that its economic value will extend well beyond 2025.

This longevity is no accident. No other platform or set of platforms comes close to delivering the performance, scalability, reliability or security of the mainframe. None offers a lower marginal cost. Nor has any other platform come close to demonstrating a similar ability to adapt to the changes in the world around it decade after decade.

### How many more years do you think your organization will continue to rely on mainframe appications?




**87% of enterprises that currently use mainframes expect to continue doing so for more than five years.**

*Source: Vanson Bourne, commissioned by MicroFocus*

Just as important, mainframe applications are the repository for irreplaceable intellectual property. These applications represent more than $1 trillion and multiple decades of investment in business rules and process logic. Optimized exploitation and extension of this core application-resident capital is therefore an existential issue for every global enterprise.

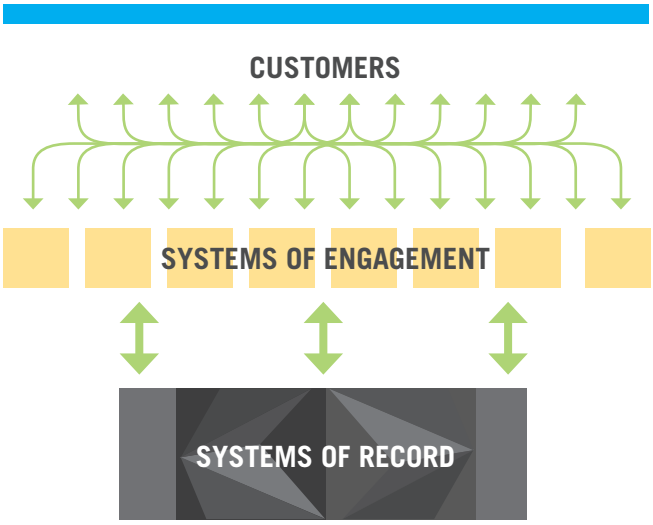
For these reasons and others, next-generation IT leaders must come to terms with the mainframe and genuinely commit themselves to making the most of its unique attributes—even as they pursue emerging opportunities such as consumerization and the cloud. In fact, it is exactly in the context of those opportunities that the mainframe has the potential to deliver even greater value over the next decade than it has in the previous five.

The question is how next-generation IT leaders can best achieve the mainframe excellence so essential to their companies' futures—and whether they will be wise enough to do so.

## THE SYSTEMS-OF-RECORD PLATFORM FOR THE PERFORMANCE ECONOMY

The digital economy is a performance economy. On the user/consumer side, performance is paramount because tolerance for anything less than immediate response and always-on reliability is relentlessly approaching zero. On the IT/provider side, performance is paramount because budget and staff resources are finite—so it's essential to have infrastructure that can efficiently support even the most processor- and I/O-intensive webscale application workloads.

To win in the digital economy, companies need more than clever ideas for apps. They need to deliver this kind of dual-natured performance. Without such performance, they will be unable to meet the ever-rising expectations of users/consumers and to support the webscale workloads that are generated as digital engagement with customers, partners and the new virtual workforce continues to grow.




**As enterprises expand their systems of digital engagement exponentially across global markets, unprecedented demands are being placed on their transactional systems of record.**

The mainframe uniquely fulfills these dual-natured webscale performance requirements. No other platform comes close to matching the mainframe's transaction processing capabilities. The mainframe's distinctively engineered combination of hardware and software places it in a class of its own when it comes to the application-level Reliability, Availability and Serviceability (RAS) required for success in an increasingly digital global marketplace.

In addition to delivering unmatched performance and handling massive transaction loads, the mainframe is also uniquely capable of processing an almost infinite amount of data. This is another vital attribute in a real-time world where companies must cope with unprecedented data volume and velocity.

The mainframe is further set apart from other platforms by key attributes such as security, manageability and low marginal cost. IT organizations have spent countless dollars and countless hours trying to bring these same attributes to their distributed and web environments—with far-less-than-hoped-for results. In fact, IT leaders are more acutely aware than ever of the insecurity, unreliability and high marginal cost of these environments. Meanwhile, in stark contrast, the mainframe persists as the gold standard in every one of these functional categories.

> **The mainframe is an indispensable platform for success in the performance economy.**

It is also worth noting that the modern mainframe System z ecosystem has expanded to include Application Assist Processors (zAAP) for Java and XML, an Integrated Facility for Linux (IFL) and other specialty engines. These enhancements have kept the mainframe highly relevant to evolving enterprise workloads.

Taking all of these key attributes into consideration, the high total cost of ownership (TCO) for distributed and web environments—combined with the suboptimal outcomes achieved despite massive investment in those environments—make the mainframe the most cost-effective platform for webscale enterprise applications.

Ultimately, these factors—unmatched performance, near-infinite data capacity, superior security, nonstop reliability, lower TCO and more—make the mainframe an indispensable, strategic platform for success in the performance economy.

## LIVING VALUE

It is not uncommon to hear people talk about mainframe applications as relics from another time—a sort of necessary evil that has to be temporarily preserved due to the lack of immediate alternatives, but that ultimately must be done away with to make room for a better future.

Such talk does not jibe with the reality of the matter. The longevity of mainframe applications does not make them less valuable. It makes them more valuable. They are the repositories of incalculable financial, human and intellectual capital that has accrued over the years. The business rules and process logic in today's mainframe applications have not been left to ossify untouched. They have been continually updated to reflect the changing realities of the business.

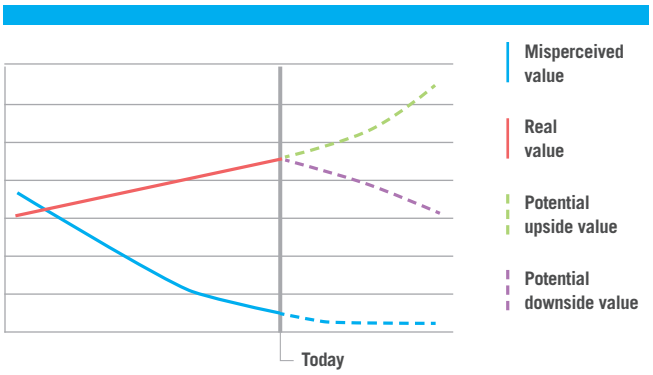
In fact, asserting that mainframe applications have lost their relevance to the business because they were originally written in the 20th century is a bit like asserting that the Constitution has lost its relevance to the government of the United States because it was originally written in the 18th century. Both are living entities that deliver living value to the institutions they support. So the correct course of action is not to abandon them—but to diligently leverage and modernize them as appropriate.

There are those, of course, who would argue that neither the Constitution nor mainframe applications have been sufficiently modernized to reflect today's changing times. And they could certainly make a strong case for both. But this is simply an argument in favor of re-doubling such modernization efforts.

**Mainframe applications are repositories of incalculable accrued financial, human and intellectual capital.**

In the case of mainframe applications, a variety of worthwhile modernization efforts suggest themselves. Generally speaking, mainframe application lifecycle management has not benefitted as much from methodology innovations such as Agile and DevOps as it probably should have. Additionally, many IT organizations have been too slow in taking advantage of the enhancements in COBOL 5.X or the opportunity to run Java and C++ code on the mainframe.

Far from offering rational justifications for throwing away the massive and precious capital residing in mainframe applications, then, well-founded criticisms of the mainframe's current state only underscore the importance of an even more aggressively evolved approach to stewardship over the platform and its applications.




**Next-generation IT leaders have the opportunity to radically increase the business value delivered by mainframe applications and data over the coming years.**

## A CULTURE OF EXCELLENCE

The mainframe platform is not only unique technically. It is also unique culturally. This culture is characterized by a rigorous adherence to a standard of excellence demonstrably higher than that associated with other platforms. IT organizations actually expect and plan for problems and patches in other platforms. Mainframe application and system programmers, on the other hand, expect and demand perfection.

This current culture of excellence has its origins at IBM in the middle of the last century. And it has been preserved and extended to the vendor ecosystem that surrounds IBM's mainframe business—as well as to the professionals who have been exercising stewardship over the mission-critical mainframe environments of the world's largest companies.

While this distinctive culture is certainly to be admired and appreciated, it must also be acknowledged that it has created a certain chasm between mainframe professionals and the rest of IT. In fact, the extremely risk-averse culture of the mainframe community—including both vendors and enterprise IT staffs—has often put it at odds with the very spirit of innovation that allows the mainframe to offer organizations such tremendous value.

This cultural chasm, in combination with the distinctive nature of mainframe technology, is also what makes the mainframe so "foreign" to next-generation IT leaders—who, as noted above, have generally spent their careers focused on other technologies.

That said, it is essential to also acknowledge the fact that IBM and its partners have aggressively evolved the mainframe to keep pace with the evolving requirements of its enterprise customers. Mainframe innovations over the past decade alone have included the introduction of zEnterprise systems that support both mainframe and distributed technologies in a single system; modern GUI interfaces replacing "green screens;" and solutions that extend enterprise data and transactions to mobile users. So, while the mainframe may not have led the way in terms of innovating systems of digital engagement, it has more than kept pace with the needs for evolved systems of record that enterprises need to support such engagement.

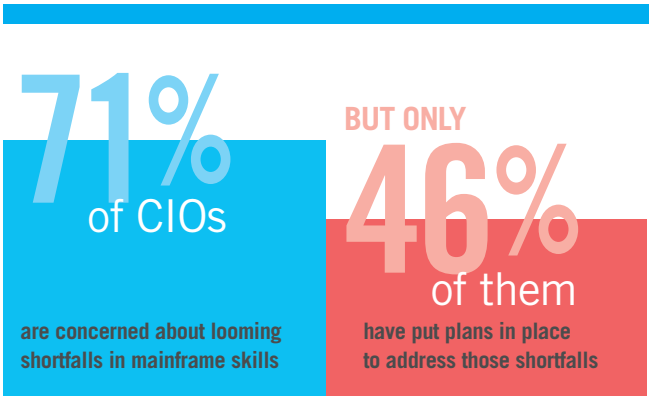
The bottom line is that enterprises do not face an either/or choice. Technology success has always been about balancing innovation and risk. Next-generation IT leaders must therefore support and sustain the mainframe platform and its associated culture even as they nurture innovation. It can even be argued that the success of that innovation may actually depend on a strong ongoing commitment to mainframe excellence.

## THE MAINFRAME WORKFORCE CHALLENGE

Perhaps the most pressing mainframe-related issue next-generation IT leaders face is the platform's transition to a next-generation workforce. The current mainframe workforce is comprised of Baby Boomers who are between 50 and 68 years old. As these experienced professionals retire, IT leaders need to replace them with a new generation of skilled technologists. This is a non-trival challenge, since younger IT pros have gravitated to other disciplines such as web, mobility and gaming/entertainment.

Several factors, however, are likely to work in favor of next-generation IT leaders when it comes to re-staffing their mainframe workforce:

- Shrinking supply relative to demand will increase the earning potential of younger tech professionals who opt for mainframe skilling. This is in contrast to the commodification of other more commonly pursued disciplines such as Java programming.
- Because mainframe systems of record are becoming so intimately associated with web/mobile systems of engagement, the mainframe workforce is likely to become less segregated from the rest of IT. This will help attract younger tech professionals who want to stay at the forefront of web/mobile innovation.
- Mainframe vendors will continue to modernize the look-and-feel of their solutions. This will make mainframe operations less foreign to next-generation "digital natives."
- The convergence of programming tools is leading to an integrated development environment (IDE) across mobile, web and mainframe environments. This will to some degree insulate enterprise developers from underlying platform complexities.
- With the support of the mainframe community, universities are developing stronger curricula and degree programs for mainframe computing. This is already helping to re-supply the industry.




**71% of CIOs are concerned about looming shortfalls in mainframe skills—but only 46% have put plans in place to address those shortfalls.**

*Source: Vanson Bourne, commissioned by Compuware*

As favorable as these factors may be for the industry as a whole, next-generation IT leaders will still have to be intentional about ensuring that their companies have access to essential mainframe skills. Mainframe application development skills will be particularly vital given the importance of maintaining and advancing the extraordinarily high-value intellectual property residing on mainframes in the context of an ever-evolving digital economy.

**IT leaders can gain competitive advantage by ensuring their access to essential mainframe skills.**

It is also important to note that while next-generation IT leaders will be tasked with evolving their companies' existing COBOL, PL/I and Assembler programs, Java will inevitably become the dominant language for new mainframe workloads. Enhancements to Java—coupled with advanced support for Java within mainframe specialty processors and microcode—will make it much easier for IT to leverage the platform's peerless transaction and data management facilities.

The mainframe workforce challenge is thus a very real one, but it is no way insuperable. In fact, like most such challenges, it offers those who meet it the opportunity to achieve sustainable competitive advantages over those who don't.

## THE ULTIMATE CLOUD SERVICE

IT faces a future that is as daunting as it is exciting. Telemetry from vehicles is enabling insurance companies to provide usage-based policies and value-added services to their customers. Wearables are creating new opportunities for the healthcare and fitness industries. Retailers are leveraging smartphones to engineer in-store experiences that are as personalized as cookie-enabled websites. There seems to be no limit to the opportunities afforded to companies by Big Data, analytics, mobility, social networking and the Internet of Things.

IT, however, needs to keep pace with the extreme volume of data being generated by these billions of devices—and it needs to be able to generate and respond to analytic outcomes in real time. Plus it has to be able to do so with the utmost security, reliability and resource-efficiency.

**The mainframe is a "cloud service" that delivers transaction processing and data management power.**

Many have placed their hope for such capabilities in the cloud—which can loosely be understood as a large, variable number of virtualized commodity-class infrastructure components (compute, memory, network, database, etc.) available on-demand, whether on- or off-premise. And there is some truth in this. The on-demand availability of commodity capacity can play an important role in the delivery of all types of IT services to all kinds of constituencies.

But the cloud has its own limitations. Some are technical, since distance and the movement of data in and out of memory present intractable performance constraints. Others relate to governance, since companies put their brand value and customer relationships at risk every time they capture, store, process or transmit information—and can ill-afford security breaches, outages or errors.


**Real-time transaction processing and large-scale data management**

In fact, if the principle behind the cloud is that companies should have access to the exact capabilities they need, when they need them, then the mainframe can be understood as providing the ultimate cloud service: the fastest, most reliable, most scalable and most secure compute power in the universe—which can readily be applied to any appropriate workload.

The mainframe, in other words, offers the enterprise of 2015—and, as far as anyone can tell today, of 2025—the ideal platform for any application that requires high rates of real-time transaction processing and vast data management power. And, given the fact that it is already the repository for most of the world's most critical data and business rules, it offers the additional advantage of incumbency. So there can be no question about the mainframe's relevance for the future. It is relevant by definition. The challenge is how to best leverage and optimize that relevance.

## A PLAN-OF-ACTION FOR STRATEGIC PLATFORM STEWARDSHIP

Given the facts of the matter, what specific actions should next-generation IT leaders take? How can they best exercise appropriate stewardship of a platform that is so vital and relevant—and that can potentially deliver so much value going forward?

While every company's requirements and resources differ, the following checklist should be helpful:

- ☐ **Fully inventory existing mainframe data, applications (including business rules), capacity, utilization/MSUs and management tools.** Because many next-generation IT leaders have not had a wealth of hands-on experience with the platform, their journey to mainframe excellence should begin with a clear and accurate baseline inventory of their mainframe's current state. Such an inventory is essential for making the right near- and long-term decisions—and for periodically assessing the quality of those decisions.

- ☐ **Build a fact-based skills plan with a realistic timeline.** A general notion that there will be skill attrition over the coming years is insufficient. IT leaders need to know which skills will be lost to retirement and when they are likely to be lost, so they can make appropriate decisions regarding skills replenishment and transfer of expertise—especially in regards to continued mainframe application advancement.

- ☐ **Ramp up on current and road-mapped mainframe capabilities.** Next-generation IT leaders will benefit from a better understanding of high-value platform attributes such as IBM's Integrated Facility for Linux (IFL), its ability to run Java workloads and its ability to contribute to "Green IT" initiatives vis-à-vis reduced energy and floor space consumption. By learning about these attributes, IT leaders can better understand the optimum role of the mainframe in their broader resource portfolio.

- ☐ **Rightsize investments in mainframe application stewardship**. As noted above, mainframe applications represent a substantial corporate asset that needs to be properly preserved and leveraged. This can't be done without an appropriately sized budget. IT leaders therefore need to gather the facts necessary to project requirements for staffing and software licenses.

- ☐ **Institute an immediate moratorium on short-term cost-cutting with long-term consequences.** IT leaders who don't view the mainframe strategically can be lured into a migration to inferior operational tools by vendors offering aggressive discounts. This kind of tactical, short-term thinking should be nipped in the bud to avoid compromising the strategic, long-term future of the platform.

- ☐ **Combat denial and hype in regards to non-mainframe platform capabilities, costs and risks.** IT has a long history of under-estimating real TCO and marginal costs for new platforms, while over-estimating their benefits. A more sober assessment of these platforms will make the strategic value and economic advantages of the mainframe much more evident in comparison.

Of course, next-generation IT leaders can take an entirely different approach to mainframe stewardship. They can view the mainframe as a burdensome relic from the past. They can starve it of resources and neglect its ongoing evolution, so that it merely lingers in the enterprise as a "legacy" system running "legacy" applications.

But that would not be a wise course of action. The mainframe doesn't just represent years of investment from the past. It is also a compelling investment for the future. Mainframe excellence is thus as much a mandate for next-generation leaders as are mobile, social and the cloud. All, in fact, go hand-in-hand. IT leaders ignore this reality at their own peril.

## ABOUT COMPUWARE

Compuware empowers the world's largest companies to advance their mainframe intellectual property to meet the demands of the digital economy. Our application development, testing and performance management software set the industry standard by enabling businesses to deliver high-quality applications more quickly, reliably and resource-efficiently. Learn more at **www.compuware.com/mainframe**.

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