

Make your mainframe work smarter not harder

Accelerating business improvement through technical innovation

INTRODUCTION

The natural home for core business applications has traditionally been the mainframe. Continued investment in maintenance, product updates and support returns critical business value year on year by keeping existing applications current, relevant and supported. It makes sound financial, business, and technical sense to ensure that business functions and the systems that support them continue to be developed, enhanced and improved as an IT priority.

However, the complexity of existing business applications and the environment that has grown up around them can limit the potential for innovation. Taking the mainframe applications forward and making the mainframe work harder requires a different type of approach to remove a number of constraints.

In this paper we examine available approaches to maximizing the value your mainframe applications deliver, and highlight the most cost-effective and pragmatic ways of improving the return.

WHY IMPROVE MAINFRAME APPLICATIONS?

It's a valid question. After all, if these systems and applications have been on the mainframe, delivering business value for up to thirty years, surely they are robust enough not to require major ongoing attention.

Mainframe applications provide core services to the enterprise. They contain information and processes so tied into how the business operates that they are key competitive assets. They have to be updated and enhanced to meet the changing business demands. Nothing stays the same as changing business demands dictate that these applications receive ongoing enhancements and maintenance. Mainframe applications are subject to changes to their interfaces, data and reporting capabilities to meet demand. The changes can come from within an organization: making more efficient use of resources, different reporting requirements, a merger or acquisition; or be driven by external factors such as legislative change, competitive pressure or changes imposed by the mainframe vendor.

Meeting the demand to change and modernize the application landscape presents the IT organization with significant challenges that are both operational and functional.

Operational Challenges

Time, resources, financial, and technical and competitive pressures all have an impact on the effectiveness of mainframe application development and workload.

> Time pressure

Getting updates into the hands of the user and delivering value on time is a major responsibility for IT. Mainframe application development and delivery is under considerable time pressure to meet aggressive timeframes.

With the IT organization having to deliver better service, all aspects of the development life cycle – including initial assessment, unit testing, and even essential pre-production test phases – come under scrutiny as potential bottlenecks in the release process.

> Resource pressure

Mainframe-based development and delivery activities demand that the right resource is available at the right time.

Development, Unit Test activities and Pre-production testing can only be scheduled according to the capacity available on the mainframe – in MIPS (Millions of Instructions per Second). If there isn't sufficient mainframe capacity for testing, the delivery of updates that meet the functional and time demands of the business is compromised. Development Heads, QA Directors and Service Delivery Managers are tied to the existing mainframe capacity and have little scope to increase throughput. In fact, they are frequently under pressure to reduce the MIPS and time that their activities consume in favour of production.

Resource constraints come into sharper focus when a new system delivery threatens to exceed available MIPS or software license limits. Mainframes are often already at the top end of their system limits due to incremental system updates, greater customer access methods such as web and mobile, and higher volumes of customer data. Adding an update can tip the balance, leading to difficult decisions about what to compromise for it to go live.

Similarly, adding more people to manual testing is unlikely to provide the solution – even if it were affordable. Outsourced application maintenance and testing is no longer the cheap option as demand for skilled professionals increases.

➤ Financial pressure

'Deliver more with less' is the mantra of today's IT organizations. Ensuring that core systems deliver trusted performance year after year, and continue to support the need to reduce cost and accelerate time to market is a persistent challenge.

The 6th annual BMC Mainframe Survey¹ found that while '60% believe that keeping costs down is the number one IT priority,' they also found that '93% of large companies expect capacity to grow or remain steady.' In short, delivering more for less cost.

The key tasks involved in building and delivering mainframe systems typically consume mainframe resources – and incur costs in lease or maintenance costs for both hardware and software. As organizations look to reduce IT costs, the spotlight falls on mainframe expenditure which is often a high proportion of the overall IT operating expenditure.

➤ Technical and competitive pressure

The mix of platform and application portfolios presents a changing landscape. A generation of technically-aware consumers demand more – better access to more services – and they are more aware than ever of the power of choice.

Today, it is unimaginable for an insurer not to offer quotes online, or for a retailer not to take money for goods through the web, or for a bank not to offer internet banking. Many industries have made innovation part of their customer experience – business flyers check-in at the gate by showing their boarding pass on their iPhone, logistics companies provide an 'app' to track deliveries on a mobile device, and innovative boutique hotels provide guests with free iPads for the duration of their stay so they can use smart technology to locate local restaurants, theatres etc.

There has to be careful thought about how to create innovative services and verify them before going live. Development technology does not usually support the creation of composite applications (i.e. those which provide web interfaces to mainframe services), and existing mainframe test practices are just not enough.

Traditional mainframe-centric methods of development and quality assurance do not usually accommodate creating, debugging, unit and system testing using Java or other new-breed technologies that interface with back-end mainframe processes.

Functional challenges

Delivering mainframe applications also raises significant challenges according to the particular activities being undertaken in the overall application delivery lifecycle:

➤ Knowing what to change

Around a decade ago, Micro Focus undertook an inventory of a major US bank's application portfolio to assist with a strategic initiative to consolidate systems. Using enabling technology, Micro Focus quickly identified a large area (roughly 4 million lines) of application code that was being diligently maintained, tested and supported, and yet was never being executed. There was no possible way the code could ever be run. This code was immediately removed from the portfolio and the bank was able to free up resources.

This highlights the importance and operational difficulty of managing the IT estate that serves the business. It's a rare IT portfolio that is fully documented and easily navigated. Only system experts with years of experience can hope to comment with authority about the complex array of interconnected systems. And with each passing year, this complexity increases².

Equally, it is not just the physical IT landscape that needs assessing before decisions about what needs to change can be taken. Factors from around the business must also be considered, such as – ongoing cost, customer satisfaction, revenues and margins, business risk, technical strategy etc.

➤ Making the change

Mainframe development processes are slow and studies show that removing dependency on mainframe-based tools can improve the amount of work achieved by between 25% and 40%³.

As previously mentioned, applications being developed are no longer ring-fenced in the mainframe world. They have to reach a wider range of target customers, platforms and devices than ever. This presents a challenge to the relevancy of any mainframe-centric delivery process.

As well as the processes and technology aspects of making the change, there is the growing concern of the availability of skills to undertake the required work. In a study of 520 CIOs, 71% said they are concerned that the looming mainframe skills shortage will hurt business⁴. As mainframe applications continue to provide enduring business value, it is no surprise that COBOL is one of the most sought after language skills on the market today.

According to Simply Hired, COBOL jobs listings increased over 100 percent since November 2009. While COBOL may not be a popular choice for new developers, the increase in job opportunities suggests there is a growing need for skills for application modernization and virtualization projects for legacy applications.⁵

> Assuring the change

There are two essential truths in software development: All software contains errors and the cost of fixing them goes up the later they are found

According to IDC, "The increased complexity of software development environments and the cost of fixing defects in the field (rather than early in the software cycle) combine in exorbitant ways to drain income and to hamstring businesses as a result of critical software downtime."⁶

Finding the right way to assure application quality as early in the process as possible is a major functional requirement. However, testing on the mainframe can demand more than 45% of mainframe processing power, ironically causing bottlenecks that compromise quality.

> Deploying change

Deploying applications in the mainframe environment is usually limited to certain pre-set parameters. This can make decisions relatively straightforward.

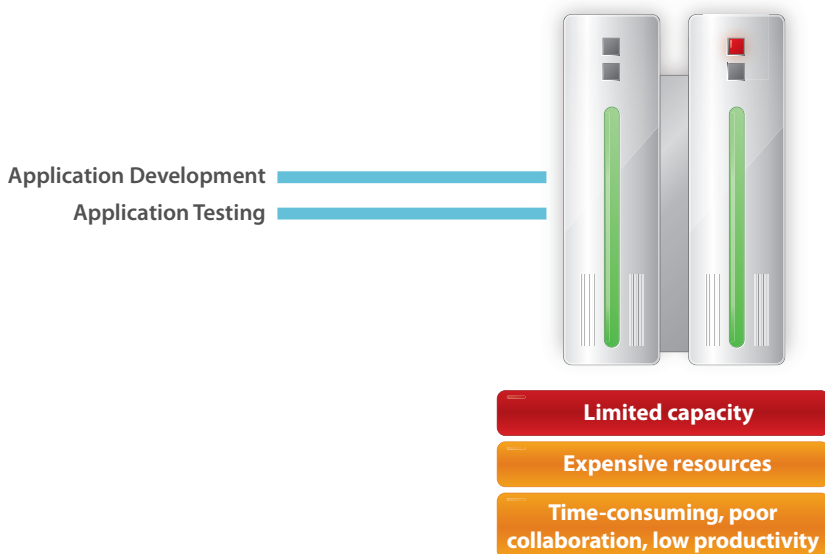


Fig 1: the mainframe environment is a bottleneck for application service delivery

The primary external consideration is cost. Deploying systems into production on the mainframe incurs significant cost which increases with the processing power consumed. This means the challenge is one of continuing justification for your production applications. Describing what an application does and the value it delivers (rather than just how much horse-power it consumes) will be vital in its ongoing operational survival.

It's certainly true that businesses, faced with cost management pressure, will try to do everything in their power to avoid incurring additional mainframe costs. The challenge is balancing that with the need to deploy more change into production.

The pressure is on IT organizations to deliver greater value from its mainframe investments and manage costs better. This is a substantial challenge which calls for a substantial solution.

OVERCOMING CHALLENGES IN THE MAINFRAME WORLD

With processes and schedules for mainframe application delivery handcuffed to the mainframe environment and capacity constraints, delivery managers and CIOs need a game-changing approach to meet the challenges. The options are:

Do the same thing, only better

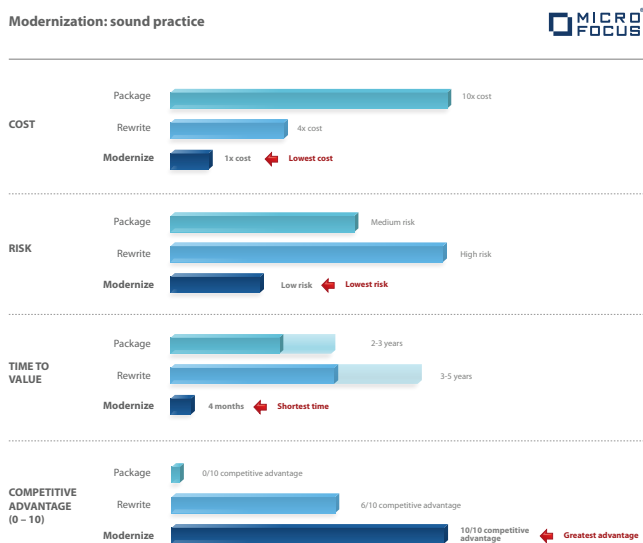
One possible approach lies in exploring 'better' ways of developing and testing applications on the mainframe. A range of technical and consultancy-led solutions claim to improve performance, either through some level of automation or other productivity-improving technology, or by employing skilled or lower-cost resources to provide testing expertise.

While these have their merits, they fail to tackle the core issue of the high cost of drawing on mainframe resources as they require further investment in the same environment either in terms of technology or people (or both).

Rip it up and start again

Faced with meeting the challenges of cost, service delivery speed, ongoing quality issues, skills shortages, lack of flexibility and poor operational efficiency ... and more, there's an obvious temptation to make a 'clean sweep'. This is especially true given the wealth of ready-made application packages available on the open market promising to address the challenges in one single purchase. For those with technical resources, and worried about their uniqueness, rewriting the applications may seem attractive.

Retailer Tesco decided to look at the reality for itself, comparing these options against a potential 'modernization' project – reusing existing systems in a more flexible way.



Or take another look

Source: CIO, Tesco

As the Tesco example illustrates, the rewrite or replace approach is not the only option, and it certainly isn't the best.

Rather than simply increasing resources to do 'more of the same', a more creative and innovative approach is to look at the common denominator linking the 'challenges' – the mainframe platform – and ask whether it is possible to make the mainframe do more without spending any more on it.

Doing this involves taking a fresh look at business needs and recognizing the place that the mainframe has within the wider IT landscape. The IT organization must consider what it can do to reduce cost, increase the speed of delivery and provide a more efficient service.

Improvements in price performance, reliability and security now make many non-mainframe platforms viable environments for some of the core IT activities that currently take place on the mainframe.

Of those platforms, the best candidates in price-performance terms are Intel or AMD based Windows and Linux servers. They also possess better and broader tooling to support these activities, though Windows has greater appeal, a broader skills pool.

This enables heavy-lifting activities such as lengthy development tasks, critical testing, and even some production workflow to happen on, for example, a Windows server rather than the expensive and resource-constrained mainframe. This high-availability and low-cost environment fundamentally resolves the major bottleneck and cost constraints presented by the mainframe.

In a typical mainframe environment, all resource requests are channelled directly into the mainframe and compete directly with production systems for resource in terms of both MIPS and time. Inevitably, this means a delay to non-production activities, potentially compromising important activities. Some, such as upfront analysis work and requirements management, may not even take place at all, or at least not formally, due to the time and resource constraints.

Improving mainframe application service delivery

The cornerstone of the solution is based on a pragmatic view of IT – basically, how to exploit the lowest-cost environment possible to do the most amount of work. Even for mainframe-centric activities this environment is for many tasks, Windows. Exploiting Windows technology releases IT development processes from the constraints of dated mainframe-based tooling and process, enabling organizations to:

- Find the time to undertake a full audit of IT assets to ensure change plans are robust and comprehensive
- Accelerate the development processes by using more productive technology that can be used by all developers but which doesn't consume additional mainframe cost
- Establish a robust and scalable test environment that does not consume mainframe cost but helps accelerate application delivery
- Offer potentially dramatic cost savings by optimizing where system workload executes

This flexibility of choice gives the CIO and IT operations teams unprecedented levels of freedom to make truly pragmatic choices to support IT transformation and modernization requirements.

The costs saved within the application creation and delivery process can be re-invested in other areas of the business, such as increasing focus on customer service or product innovation, while enabling faster time-to-market and improved product quality to improve competitive positioning.

Introducing Windows to serve as the environment for various development, debugging, unit testing, system testing and in some cases even workload deployment, breaks the vicious cycle of resource dependency and releases teams to set their own build, test and delivery schedules (Figure 2) without jeopardizing standards or quality.

What's more, developers, test teams, quality assurance engineers, end-users, or non-mainframe programmers (Java or .NET programmers, for example) involved in developing composite applications that use mainframe resources, can access those applications in a unified distributed environment for development and testing activities, without consuming mainframe processing power. Traditional barriers to teamwork can be addressed by giving the same platform and tooling power and flexibility to both mainframe COBOL and non-COBOL teams.

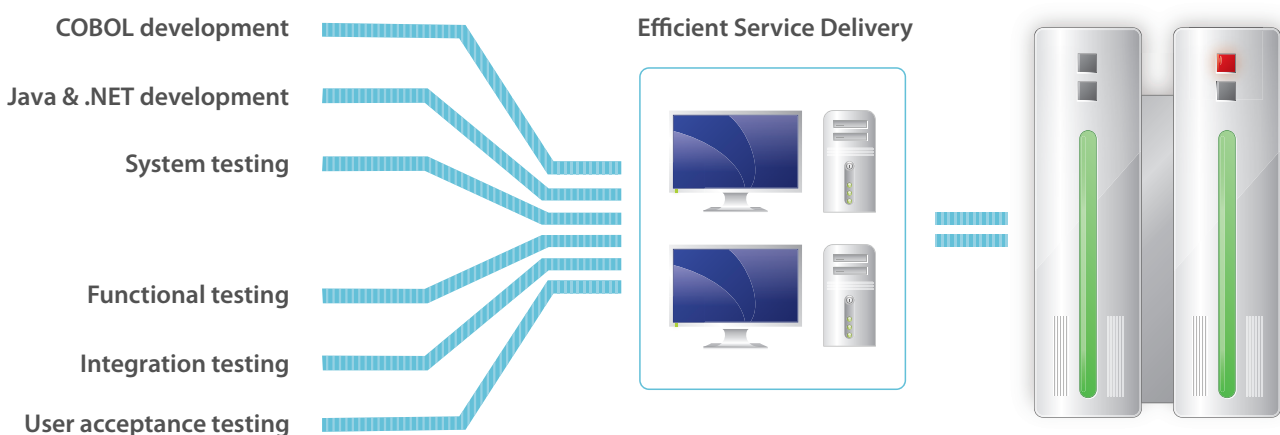


Fig 2: Unprecedented flexibility and cost-efficiency

MAKING THE MAINFRAME WORK SMARTER

Transforming mainframe application delivery to increase effectiveness and performance of key activities without calling on mainframe resources is not a simple task. For a modernization project to be worth considering there has to be some guarantee that the applications will perform on the Windows environment just as they do on the mainframe. The technology needed to provide an analysis, development and testing environment away from the mainframe must incorporate a number of key capabilities:

- The ability to view the entire application estate holistically or by area
- The ability to manage and review customizable metrics about applications to allow key IT change decisions to be taken based on real data
- Full z/OS mainframe compatibility to properly emulate the mainframe
- Advanced development environment for development, debugging and unit testing of mainframe applications, in the same framework as used for non-mainframe development (e.g. Java or C#)
- Mainframe equivalence for common mainframe sub-systems including CICS, VSAM, IMS, DB2 and JCL
- Support for COBOL, PL/I and other mainframe language elements
- Scalable solution to allow smaller- or large-scale testing to be undertaken
- Flexibility of data access, so data can remain on the mainframe or be brought down to the server
- Flexibility of application access, where unchanged code can remain on the mainframe, and only the changed elements that need testing can be focused on in isolation
- Full reference architecture to support the de-deployment of mainframe applications in a Windows execution environment, including appropriate reliability, availability and scalability

WHAT DOES THIS DELIVER?

Once the right approach to transforming mainframe application delivery has been taken, the outcomes for the business are significant. Among the 500 plus modernization projects undertaken using Micro Focus technology, customers have realized significant benefits around the areas of:

Capacity/Time to market: State of the art tooling means development teams can create robust applications far quicker, and QA and delivery teams can complete testing phases faster and with higher quality as test cycles are not constrained by scarce mainframe processing power. And, as the build environment is on Windows, non-mainframe stakeholders including business users and front-end (Java) developers have access to the whole framework, making the development of previously unimaginable levels of integration to be built into enterprise applications.

Cost containment/Reduction: Increasing capacity for application delivery on a low cost commodity platform avoids the need for substantial investment in new mainframe MIPS. In fact, organizations have been able to reduce mainframe MIPS consumption while increasing application delivery capability by performing development, testing and even some production workload off the mainframe.

Quality: None of the benefits count if the quality of delivered applications is at risk. In fact quality improves as teams are able to collaborate effectively, identify issues earlier in the development cycle and reduce costly rework. With more debugging and testing achievable in shorter timeframes, increased testing raises quality. This approach enables many organizations to deliver genuine end-to-end testing of composite COBOL and Java applications in a single environment for the first time, again improving overall quality.

CONCLUSION AND NEXT STEPS

The value of the Micro Focus approach is being felt around the world, in enterprises across state and local government, retail, manufacturing, transportation, finance and insurance industries and many more.

The Micro Focus suite of Enterprise products has given these businesses important capabilities to:

- **Ensure** a thorough understanding of the application portfolio at both management and technical levels
- **Expand** the skills pool by bringing modern development and testing techniques to the mainframe environment
- **Exploit** cheaper and easily available processing power for development, testing and production
- **Enable** choice for modernizing mainframe applications

By providing a compatible mainframe environment away from the mainframe for the redistribution of mainframe workload, Micro Focus is changing the game. We are revolutionizing how mainframe applications are developed, modernized, tested and how key IT services are delivered.

For more information visit www.microfocus.com

REFERENCES

¹ Annual Mainframe Research Report, BMC Software, September 2011

² <http://www.businesscomputingworld.co.uk/making-mobile-work-for-your-business/>

³ Source: Micro Focus case studies

⁴ Vansen Bourne study undertaken on behalf of CA. <http://servers.cbronline.com/news/companies-cant-find-mainframe-skills-for-love-nor-money-survey-24112011>

⁵ Who still cares about COBOL? <http://www.techweekeurope.co.uk/comment/who-still-cares-about-cobol-45945>

⁶ IDC: Improving Software Quality. June 2008

About Micro Focus

Micro Focus, a member of the FTSE 250, provides innovative software that allows companies to dramatically improve the business value of their enterprise applications. Micro Focus Enterprise Application Modernization, Testing and Management software enables customers' business applications to respond rapidly to market changes and embrace modern architectures with reduced cost and risk.

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