Modernizing Mainframe Development Tools Can Help Drive Greater ROI

Implementing These Tools Better Utilizes Mainframe Technology, Improves The Developer Experience, Increases Efficiencies, And Improves Business Output
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Executive Summary

The ability to develop, deliver, and maintain software is critical to business success, whether the software is hosted in the cloud or on the mainframe. Mainframe application development software has continued to evolve to be cross-platform oriented, and mainframe development tools are critical to enterprise plans. However, these tools are often hobbled with outdated and ineffective software development tools that slow developers down and create enterprise risks. IT leaders are neglecting one of the most important aspects of mainframe technology: ubiquitous software development tools that deploy applications to the platforms needed to run their businesses.

BMC commissioned Forrester Consulting to evaluate the state of mainframe development tools at IT organizations. To explore this topic, Forrester conducted an online survey with 408 software developers from EMEA and North America involved with software and application development for the mainframe at their organization. We found that 76% of developers indicated the mainframe is of utmost importance to their organization and 79% said their organizations’ mainframe development tools need significant improvements to be effective in developing mainframe applications. If they had the proper mainframe development tools, the quality of their organizations’ applications would increase by 23%.

KEY FINDINGS

› **Despite the importance of the mainframe, most IT teams rely on subpar software development tools.** While most surveyed developers indicated the importance of the mainframe to their organizations, few praise their current development tools. In fact, most felt their mainframe development tools are subpar when compared to other platforms they use. This creates a world of “haves” and “have-nots” that not only slows mainframe development teams down, but also increases enterprise issues such as skills gaps and recruitment challenges that further compound enterprise challenges when modernizing mainframe applications for the digital age.

› **Subpar mainframe development tools result in lower quality applications, which bring greater enterprise risk.** Developers reported doing basic software development tasks, such as understanding and identifying source code changes, is challenging. The same is said for other software development basics, such as test automation and performance testing. But even more concerning is that 56% of developers stated that maintaining operational stability and uptime is very challenging. That is not particularly comforting for an enterprise relying on the mainframe to perform transactional processing or operate as a centralized data server.

› **Modern mainframe development tools deliver true ROI.** From increasing velocity to increasing quality of work, developers report that modern mainframe software development tools are worth the investment. Three-quarters of surveyed developers reported that modern development tools will help them increase release velocity. Nearly two-thirds said modern tools will increase quality. With many developers indicating the usage of a mainframe rivals their use of hybrid and cloud, it seems about time their mainframe development tools should rival those platforms as well.
Subpar Mainframe Development Tools Stunt Mainframe Application Modernization Efforts

Across industries, customers and users demand new and modern applications and automation. It’s no wonder that top priorities for mainframe development teams are providing better personalization to customer-facing web and mobile experiences, implementing DevOps practices, and increasing automation. The pandemic has only accelerated this demand, placing more urgency on the tools needed to achieve those goals.

That is why mainframes have been — and continue to be — important to organizations and enterprise infrastructure now and into the future. In addition to mainframes, development teams work on multiple platforms, such as cloud-native apps, on-premises apps, and mobile apps, to develop and maintain systems. Despite the stated importance of mainframes, developer experience working on mainframes is inferior compared to most of these other systems.

- **The pandemic created more urgency for modern applications and automation.** To keep up with demand during the pandemic, the initiatives that developers reported prioritizing over the next 12 months include:
  - Better personalization of customer-facing web and mobile experiences (77%).
  - Implementing DevOps practices of continuous integration (CI) and continuous delivery (CD) pipelines (72%).
  - Increasing automation of software development life cycle (SDLC) tasks (71%).
  - Improving secure practices for mainframe developers (71%).
  - Increasing the use of feedback loops (65%) (see Figure 1).

The COVID-19 pandemic heightened the importance of these initiatives by at least 50%. For some, it increased the importance by as much as 71%.
Mainframes are considered very important or critical to an enterprise infrastructure. Over three-quarters (76%) of developers indicate the mainframe is very or critically important to their organizations and over half (58%) of their organizations’ IT infrastructure relies on the mainframe.

Relative to the other systems developers work on, their mainframe experience is inferior. The mainframe experience is considered relatively inferior to each of the other systems used for developing and maintaining applications. Among developers, 58% said developing for the mainframe is worse than mobile-based systems, 52% said it’s worse than on-premises workloads, 48% said it’s worse than webservers, and 45% said it’s worse than cloud-native.
The Lack Of Modern Mainframe Tools Undermines Software Quality And Increases Risk

Finding people with the right skills and retaining top IT talent is a major hurdle for mainframe developers when developing mainframe applications. Another challenge is culture, since there are incorrect perceptions that mainframes are costly and not agile. Modernizing mainframe developer tools can retain and acquire talent, making the mainframe more accessible. Additionally, using a common set of development tools that all developers can use regardless of platform would reduce the ramp-up time for new mainframe programmers.

Not utilizing the most advanced developer tools also results in poorer software quality, which places the enterprise at risk. In fact, eight out of 10 (79%) developers said their mainframe development tools need significant improvements to be more effective.

When developing mainframe applications, it’s harder to identify performance issues, conduct automated testing, and detect issues in existing source code. Additionally, it causes slower release times, increased security risks, and the inability to automate SDLC tasks, which results in operation instability. Modernized software can address these issues and help improve outdated perceptions of the mainframe.

› **Internal challenges, such as staffing and cultural resistance, create hurdles for developing mainframe applications.** Finding people with the skills needed to modernize mainframe apps is the biggest challenge (72%). Respondents also reported other challenges, such as changing misperceptions of the mainframe being costly and not agile (62%) and acquiring and retaining top mainframe talent (59%) (see Figure 2).

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Eight out of 10 developers said their organizations’ mainframe development tools need significant improvements to be more effective.

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**Figure 2**

“How challenging are the following business/operational factors when developing mainframe applications?”

(Showing “Very challenging” and “Extremely challenging”)

**Staffing**

- **Finding people with the skills needed to modernize mainframe apps**: 77%
- **Retaining top IT/mainframe talent**: 59%

**Culture**

- **Changing the perception around mainframe as being costly and not agile**: 62%
- **Managing cultural resistance to change**: 42%

Base: 408 global developers involved with software and application development for the mainframe
Source: A commissioned study conducted by Forrester Consulting on behalf of BMC, May 2021
Improving the developer experience increases employee satisfaction, retaining and acquiring critical talent. IT decision-makers recognized the need to improve the developer experience to retain talent and stay competitive in a tough hiring environment. Nearly three-quarters (72%) reported their developers’ experience needs improvement and nearly two-thirds (64%) reported that the employee satisfaction of their developers is critical to their organizations’ ability to retain critical talent. Further, 59% said that improving their developers’ overall employee experience would place their organization in a more competitive position when it comes to hiring (see Figure 3).

Figure 3
“Rate your level of agreement with the following statements.”

- The experience of our developers needs improvement. 72%
- The employee satisfaction of our developers is critical to our ability to retain critical talent. 64%
- If the overall employee experience of our developers were improved, we would be a more competitive organization when it comes to hiring. 59%

Base: 408 global developers involved with software and application development for the mainframe
Source: A commissioned study conducted by Forrester Consulting on behalf of BMC, May 2021

The lack of modern mainframe development tools hinders development teams’ ability to improve software quality and slows down ramp-up times. This is especially significant as reduced quality places the enterprise at risk. There are several challenging technology factors when developing mainframe applications. These include detecting performance issues, automated testing, and understanding and identifying what changes need to be made to existing source code (see Figure 4).
If companies had a modern tool that could be integrated across platforms, they would be able to greatly reduce onboarding times and increase the time-to-productivity for new hires. Further, this modern tool set would create a more seamless experience for existing employees who might otherwise be difficult to retain in a market with a talent shortage. Having an understanding of program logic, how the entire application works, and how dependent applications use data is all needed to make a quality change. This more seamless, consistent experience would also reduce the risk of employees making errors or bad changes that could impact the security of the organization.

The absence of modernized mainframe development tools causes slower release times and increased risk. In addition to the slower release cycle time and increased security risks, there is also the inability to modernize applications and automate SDLC tasks, as well as unintegrated front-end and back-end systems. These risks often result in operational instability. In fact, 56% of developers agreed that it’s a significant challenge to maintain operational stability and uptime as updates to mainframe applications are released.

The risks resulting from outdated mainframe development tools cut across multiple dimensions from scalability to security. The issues involve releasing applications less securely (55%) and reliably (41%), greater risk of cyberattack/breach (44%), less visibility into live site metrics (41%), and the inability to scale high volume of transactions (40%).
Modernizing Mainframe Development Tools Delivers Multiple Benefits And Improves Development Teams’ Output

The use of software tools to modernize the mainframe development experience increases both the velocity and quality of development teams. This yields multiple benefits including more productive development teams, better compliance, more uptime, and predictably higher-quality releases. A combination of these factors can ladder up to an increased ROI for the overall organization.

To stay competitive and succeed in meeting the increased demand from customers for modern applications and automation requiring mainframe technology, it’s essential for organizations to implement these tools. Increasingly, more companies recognize the value that these tools can provide and are investing in modernization efforts. As the demand continues, the potential upside will only increase and companies that fail to implement modern development tools will quickly fall behind.

› **Implementing modern mainframe tools drives both business and technical benefits.** Many of the benefits of having software tools that modernize mainframe development address the critical challenges that companies are facing head on. From a business/operational perspective, the top 5 benefits include:
  1. More productive developers.
  2. Better adherence to regulatory and privacy compliance.
  3. Increased ability to retain operational stability/uptime as updates to mainframe applications are released.
  4. Increased competitive advantage.
  5. Predictably higher-quality releases.

The top 5 technical benefits of having software tools that modernize mainframe development include:
  1. Greater security controls/reduced risk.
  2. Increased mainframe agility.
  3. Improved security monitoring.
  5. Quick remediation of threats and the improved ability of developers to deliver high-quality code with less friction.

› **Developers recognize modernization tools will increase the velocity and quality of applications.** Over three-quarters (77%) of survey respondents reported that software tools modernizing mainframe development will increase the velocity of developing applications by 18%. Nearly two-thirds (62%) said it will increase the quality of their organizations’ applications by 23%. This can lead to multiple benefits that can help drive ROI for an organization over time.
Organizations are increasingly investing in modernization tools for the mainframe. One-third (35%) of decision-makers reported that their organizations have modernized their mainframe applications, while nearly another third (31%) are in the process of modernization. Notably, 20% plan to modernize their organizations’ mainframe in the two years, which would bring up the total number of respondents whose organizations who have modernized mainframe applications to 86% in just two years (see Figure 5).

**Figure 5**

"Which of the following statements best describes your organization’s effort to modernize applications that run on mainframe?"

<table>
<thead>
<tr>
<th>Statement</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>We have completed the process of modernizing our mainframe applications.</td>
<td>35%</td>
</tr>
<tr>
<td>We are in the process of modernizing our mainframe applications.</td>
<td>31%</td>
</tr>
<tr>
<td>We are planning to modernize our mainframe applications in the next two years.</td>
<td>20%</td>
</tr>
<tr>
<td>We are planning to migrate away from mainframe to an alternative platform or cloud.</td>
<td>9%</td>
</tr>
<tr>
<td>We have no plans to modernize our mainframe applications.</td>
<td>6%</td>
</tr>
</tbody>
</table>

Base: 408 global developers involved with software and application development for the mainframe

Note: Percentages may not total 100 because of rounding.

Source: A commissioned study conducted by Forrester Consulting on behalf of BMC, May 2021
Key Recommendations

Many organizations have realized that the mainframe systems their companies have relied on for years are not only a capable platform for today, but also for the future.

Our study showed that organizations who have implemented modern mainframe development tools have effectively improved the developer experience on mainframe vs. other systems by 25%. This has created a positive relationship with the mainframe platform, making it more likely for their organizations to factor a mainframe into their future plans. We also discovered that teams with modern tools are further along in their efforts to create modern mainframe applications and have fewer issues with skills gaps and top-talent acquisition. This makes it clear that modern mainframe development tools enhance the developer experience, improve business outcomes, and drive return on investment.

When choosing a modern mainframe development tool, look for the following:

**A modern integrated development environment (IDE) for editing and debugging code and automating testing.** Developers can clearly see the difference between a modern IDE and one that is legacy. Modern tools allow developers to find and manage code more efficiently and with greater quality, enabling them to complete tasks quicker and move on to the next. Attempting to automate testing on a legacy system is a challenge for many, so seeking a modern tool with automated testing features is critical to reducing overall risk.

**Modern source code management for better version control and deployment capabilities.** It’s hard to imagine a development team not having modern version control, yet many operate this way. It’s simply not sustainable and invites risk into each and every code change. A modern source control system provides version control, creates an audit trail of changes, and helps development teams achieve compliance and reduce risk.

**The ability to provide process metrics, such as velocity, quality, and efficiency.** As new concepts, such as value stream management, take hold in the software industry, the ability to capture software development KPIs has become an important component to a development team’s modernization efforts.
Appendix A: Methodology

In this study, Forrester conducted an online survey of 408 developers in EMEA and North America who are involved with software and application development for the mainframe at their organization to evaluate mainframe digital transformation. The study began in April 2021 and was completed in May 2021.

Appendix B: Demographics

Base: 408 global developers involved with software and application development for the mainframe
Note: Percentages may not total 100 because of rounding.
Source: A commissioned study conducted by Forrester Consulting on behalf of BMC, May 2021