HOW AI IS REVITALIZING MAINFRAME SOFTWARE AND EMPOWERING A NEW GENERATION



For years, discussions about enterprise IT innovation have focused heavily on distributed platforms, cloud-native architectures, and newer development paradigms. In that conversation, the mainframe has often been misunderstood or overlooked—not because it stopped evolving, but because its role as a highly optimized, mission-critical platform has largely remained behind the scenes. In reality, mainframes have continued to grow in importance for many organizations, underpinning critical business operations across industries such as banking, insurance, retail, and healthcare. The 2025 BMC Mainframe Survey showed that 97 percent of respondents see the mainframe as a long-term platform or platform for new workloads — the highest positive perception in the 20-year history of the survey. Those of us currently working on the mainframe work on the most modern and successful platform around.

The mainframe skills gap: A looming challenge

While the mainframe remains vital, its critical personnel, which built and maintained these mainframe systems and the applications, is retiring rapidly. These individuals built the environments that run the world, but over time organizations accumulated significant technical debt—not because the platform stagnated, but because systems grew in complexity faster than documentation and knowledge-sharing practices could keep pace.

The now-retiring workforce knows all the nooks and crannies of the systems, has native knowledge

of the applications, and knows just what is normal and what's not—system-level knowledge that might not be shared as these critical resources leave the firm. This has created a gap between technology and implementation—between understanding *how* systems work and *why* they behave the way they do. As experienced practitioners leave, newer team members inherit highly capable systems that are often difficult to fully understand, change, or optimize with confidence.

AI: The key to unlocking mainframe potential for new talent

Artificial intelligence (AI) is transforming how we interact with and manage mainframe software. Modern mainframe products are increasingly incorporating AI-powered features, fundamentally changing how both seasoned professionals and newcomers approach system management, application development, and troubleshooting. While many BMC AMI solutions have machine learning and rules-based automation, these technologies historically assumed a baseline level of domain expertise. As that expertise becomes harder to sustain at scale, AI provides a new layer of assistance, helping users understand complex behaviors, interpret signals, and make informed decisions with greater confidence.

In this way, AI becomes an enabler: reducing the time it takes to understand systems, lowering the risk of change, and helping organizations move faster without sacrificing reliability.

The goal is not to replace IT personnel, but rather to support them and ensure the continuity of essential business functions. As the pool of experienced mainframe experts shrinks, AI acts as an indispensable ally, automating routine tasks, offering intelligent recommendations, and preserving institutional knowledge. By integrating advanced AI technologies, companies like BMC help new IT professionals quickly understand complex system setups, make informed changes, and maintain the reliability that organizations count on. AI keeps the lights on, safeguarding mission-critical operations and empowering both new and veteran mainframers to succeed.

Key components required to help AI benefit mainframe software

- **Automated discovery and documentation:** AI-driven discovery helps uncover system relationships, dependencies, and behaviors that may not be well documented, making it invaluable for new employees who need to understand decades-old systems with minimal documentation.
- **Intelligent recommendations and guided changes:** AI can highlight optimization opportunities, flag potential risks, and suggest safe, context-aware actions, helping teams move forward with greater confidence.
- **Self-healing and predictive maintenance:** By analyzing patterns across operational data, AI can anticipate performance bottlenecks or emerging issues before they impact the business.
- **Natural language interaction**: Conversational interfaces allow users to ask questions in plain language, lowering barriers to insight and enabling faster problem resolution.
- **Institutional knowledge capture and r**: AI helps preserve hard-earned expertise by capturing how issues were resolved, why decisions were made, and what outcomes were achieved—making that knowledge available to future teams.

The mainframe is not simply enduring, it is evolving to meet the demands of an increasingly complex digital landscape. The challenge facing organizations today is not the relevance of the platform, but the ability to scale understanding and expertise as systems grow and workforces

change.

Mainframe software companies like BMC are leading the way by ensuring AI is a platform for all their software solutions, assisting professionals maintaining system reliability and unlocking new possibilities. The mainframe will continue to be innovative in the future, enhanced by filling the gaps and powered by intelligent software and a new generation eager to build on the legacy of their predecessors.

Learn more about how AI is helping organizations bridge knowledge gaps and improve operational efficiency in the Modern Mainframe podcast episode, Closing the Mainframe Expertise Gap with GenAI and AI Agents.