

WHITEPAPER

# Can AI Truly Bridge the Mainframe Modernization Gap?

Comparing AI-driven approaches to code explanation, discovery, and mainframe transformation

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## Key Highlights:

- AI-powered tools are transforming mainframe modernization and operations but face challenges with legacy languages like COBOL.
- Effective code explanation and discovery require robust datasets to train AI models.
- Zorse Project addresses gaps in training data by focusing on COBOL-specific datasets and evaluation tools.
- Generative AI holds promise but requires careful integration with existing mainframe environments.
- Enterprises must balance automation with human oversight to ensure modernization success.

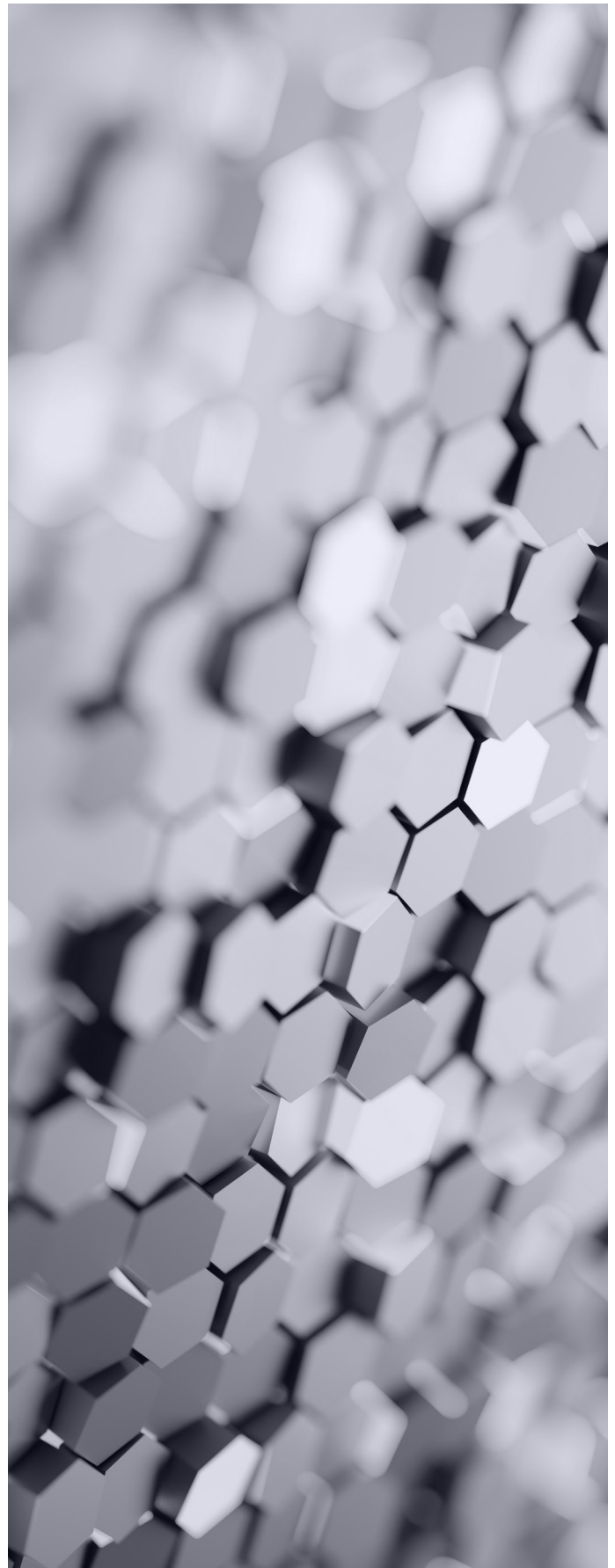
**The News** - Recent advancements in AI-powered tools aim to simplify mainframe modernization, focusing on code explanation and discovery for legacy applications. Solutions such as IBM watsonx Code Assistant for Z and Amazon Q Developer are leveraging generative AI to enhance productivity and accelerate modernization timelines. However a critical challenge remains the scarcity of training data for COBOL, which limits the effectiveness of AI models in mainframe contexts. The recently announced Zorse Project seeks to address this by developing COBOL datasets and evaluation benchmarks. [Learn more about Zorse Project from the Open Mainframe Project.](#)

**Analyst Take** - Modernizing mainframe application has always been a complex task due to the unique challenges posed by legacy programming languages like COBOL, PL/1, JCL And REXX. Generative AI tools have emerged recently as a promising solution to tackle these challenges, offering capabilities such as code explanation, performance optimization, and if the hyperbole is to be believed automated refactoring. However, a new challenge is emerging: the effectiveness of these tools often depends on the quality and availability of training data, particularly for mainframe languages - put simply - without a sufficient corpus of code to train on, these models will struggle to reach their potential.

# Too Little COBOL In The Wild?

Several AI-powered tools for mainframe modernization have been introduced recently, each offering unique functionalities. The latest version of [IBM's watsonx Code Assistant for Z](#) focuses on understanding, refactoring, and optimizing COBOL code, while also providing JCL explanations. Amazon Q Developer, [launched recently at AWS re:Invent](#), looks to accelerate modernization by automating code analysis, documentation, decomposition, and refactoring. [AveriSource recently launched the most recent version of its suite of tools](#). Despite these advancements, a common limitation that is rapidly emerging is the lack of comprehensive datasets to train AI models on COBOL, making the newly emerging Zorse initiative by the Linux Foundation's [Open Mainframe Project](#) to build a permissively licensed COBOL dataset a critical development.

The Zorse Project differentiates itself by not only creating datasets but also introducing tools like COBOLEval to benchmark AI performance on mainframe programming tasks. This effort is particularly noteworthy as it addresses a foundational issue - AI's inability to perform optimally without sufficient, high-quality training data. This lack of training data is not surprising when you think about it - COBOL is where the IP and business critical logic of the world's largest companies and governments is encapsulated, why would they share it for LLM training? The Zorse project looks at collecting decommissioned mainframe systems and leveraging permissively licensed COBOL code, if successful Zorse will ensure that AI tools have a robust foundation to improve their capabilities and provide the training course for LLM's.





## Comparing the AI tools on the Market for Z

**IBM** - Comparing AI-driven approaches, tools like watsonx Code Assistant for Z are targeted at enhancing developer productivity by explaining and optimizing COBOL code. Their ability to provide real-time insights into code functionality and performance issues helps address the talent gap caused by the retirement of seasoned mainframe developers. IBM is investing heavily in Granite models and is getting traction with its guardrails and attestation driven approach, what I am yet to see is evidence of proven ROI from migrating COBOL to Java in the context of a modernise on the mainframe approach. If the approach is modernising a z/OS based COBOL application to Linux running on the mainframe, then the refactoring of the code makes sense, if the application is staying on z/OS then I am more unsure, unless IBM is going to let the Java application be classified as a zNALC workloads, which I doubt.

**BMC** - Announced over the summer and going GA in October BMC AMI Assistant integrates generative AI into existing mainframe solutions to address modernization and operational challenges. It focuses on real-time code explanations, root cause analysis, and actionable insights, enhancing productivity across developers, which is similar to the approaches of the other players in the market. Where BMC is differentiated is with system programmers, and IT managers, where AI is deployed in an AIOps context. The tool simplifies legacy code understanding and development through integrations with modern IDEs like VS Code, while also automating DevOps metrics reporting. By bridging the mainframe knowledge gap, BMC's approach reduces reliance on senior talent and accelerates the modernization of complex systems which will be appreciated by its clients.

**AWS** - The most recent player to the party is AWS. The M2 services on AWS has been the home for a mainframe modernization approach by the company for a while now, but the recently announced service based on Bedrock and Q looks to automate the migration from the mainframe to AWS. I was briefed by the AWS team prior to the launch at re:Invent, but it was obviously hard to gauge the deployment success and client adoption given the newness of the service. What will be interesting for me is that AWS is an obvious player in the space and as a result they will get invited to every party, especially through their relationships with Accenture, Deloitte and Kyndryl amongst other GSI's. The automation angle is interesting on the surface, but I will need to see more depth on how layers like CICS and workload scheduling are handled to be bullish on the surface as a holistic migration tool.

**Broadcom** - As a major player in the mainframe space, Broadcom has focused its AI efforts on the recently announced WatchTower platform. WatchTower for mainframe AIOps incorporates Machine Learning (ML) insights designed to assist organizations in preventing downtime and optimizing IT operations. The ML Insights feature leverages advanced ML capabilities to proactively identify abnormal system behavior, issuing anomaly alerts that facilitate expedited root-cause analysis and problem resolution. This

functionality aims to analyze extensive data using a combination of data science algorithms and embedded expert knowledge to deliver actionable insights. Additionally, the platform can initiate automated problem remediation processes, enhancing system efficiency and reducing reliance on human expertise.

As far as I can ascertain, the Broadcom team are yet to leverage LLM's in their development portfolio, but I expect the company to be playing an active role in the Zorse project given they are a platinum member of the Open Mainframe Project and actively commit code for numerous other projects such as Zowe.

**Other players** - Numerous other players are emerging who are touting their LLM based solution bonafides. Two stand out for different reasons. Firstly Mechanical Orchard, the company is heavily backed to the tune of \$50m by tier one VC's and recently garnered an WSJ article, and raised \$24m in initial funding back in February. This well backed start-up is making waves given that Chamath Palihapitiya is backing the firm led by a former Pivotal founder, Rob Mee, and as such I expect them to have access to top talent and deep pockets to drive the core innovation needed to get traction.

The other notable player leveraging their long standing bonafides in the mainframe space is AveriSource, after a pivot to a more software focused model the company is leveraging LLM's to drive code discovery and mapping. The AveriSource Platform looks to provide tools for modernizing legacy applications by pulling on over 30 years of expertise and a proprietary knowledge base derived from analyzing over two billion lines of code. Its suite of tools that fall in to; Scan, Inventory, Discover, Analyze, and Transform, operate as an integrated workflow, capturing and utilizing insights at each stage of the modernization process. These tools automate the discovery and analysis of legacy systems, enabling the development of modern architectures such as data and business logic microservices. Through features like business rule identification and variable mapping, the platform aims to ensure accuracy and maintainability in the code it generates. From various briefings my take is that this approach reduces reliance on manual processes and addresses the challenges associated with the limited availability of legacy system expertise. By focusing on precision and integration, the AveriSource Platform supports organizations in transitioning mainframe and midrange applications to modern environments efficiently. Find out more in a recent blog from the company on what they are doing with LLM's





## Looking Ahead

Based on what I am observing, the critical factor for success in AI-driven mainframe modernization is the availability of domain-specific training data - Put simply there is not enough COBOL in the wild to train the models. This is not surprising given COBOL is where mainframe customers encapsulate their business logic within their most critical applications. The key trend that I am going to be tracking is how companies like IBM, AWS, BMC, and AveriSource (amongst others) collaborate to enhance the effectiveness of AI tools for mainframe systems. Based on the challenges Zorse's approach to building COBOL datasets positions will play a pivotal role in addressing this emerging challenge in the industry.

When you look at the market as a whole, the recent announcements underscore the growing need for specialized solutions in mainframe modernization. Moving off the platform remains a large, complex project that will take years to execute, it can be done but it should not be undertaken lightly or without the proper planning. Enterprises should evaluate AI tools not only on their functionality but also on their ability to address foundational gaps in training and evaluation. HyperFRAME will be tracking how these initiatives evolve and contribute to bridging the modernization gap in future quarters.



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