

# Modernize Software Pairs Generative AI With Deterministic Code Translation for Mission-Critical COBOL Modernization

*Austin-based division of Semantic Designs combines AI-assisted analysis with its DMS symbolic-AI engine to deliver verifiable, repeatable legacy code migration.*

AUSTIN, TX, UNITED STATES, October 16, 2026 /EINPresswire.com/ -- Modernize Software, the legacy modernization division of Austin-based Semantic Designs, today outlined its approach to modernizing mission-critical software in the AI era. The company uses

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AI makes modernization fast. Proof makes it safe, The organizations that get this right will use both.”

*Dr. Ira Baxter*

generative AI to speed up code analysis, documentation and testing. It then uses its deterministic DMS engine to verify that translated code preserves every business rule of the original system. DMS measures transformation completeness by accounting for all the nodes in the

original program's abstract syntax tree have been translated, while testing helps establish that the resulting application preserves the original system's business rules and behavior.

The announcement follows a surge of interest in AI-driven COBOL modernization. In February 2026, Anthropic published guidance on using its Claude Code assistant for COBOL modernization, and IBM shares fell about 13% the same day. Since then, AI vendors have marketed autonomous code migration to enterprises and federal agencies.

“Generative AI has changed how fast teams can understand legacy code, and we use it every day,” said Dr. Ira D. Baxter, founder and CEO of Semantic Designs. “But understanding code and proving a translation is correct are different problems. For systems that move money, pay benefits or fly aircraft, organizations need to know the new code does exactly what the old code did. That takes a deterministic process with an audit trail.”

## The Verification Challenge

Large legacy systems often contain millions of lines of code and decades of embedded business rules. Many of those rules are undocumented, and the engineers who wrote them have retired. Language-model translation is probabilistic: the same input can produce different output on separate runs. Errors may compile cleanly and appear correct. At a scale of several million lines, manually reviewing generated code against the original is impractical.

## How the Approach Works

DMS (Design Maintenance System) combines symbolic AI with compiler technology. It parses source code into abstract syntax trees and analyzes how control and data flow through the program. It then applies mathematically defined rewrite rules to generate maintainable code in the target language.

The same input produces the same output on every run, and each change can be traced to the rule that produced it. Code that cannot be converted deterministically is flagged for engineer review. Generative AI runs alongside DMS to accelerate business-rule extraction, architecture documentation and test design, while the deterministic engine controls the final translation.

## Track Record

Semantic Designs has built code transformation tools since 1995. Its published engagements include:

1. Converting the Northrop Grumman B-2 Spirit flight program from JOVIAL to C with 100% accurate translation, validated jointly with Northrop Grumman engineers
2. Converting a 7-million-line COBOL application to C#, with 100% of the conversion fully automated
3. Building a custom DMS-based tool for Dow to migrate chemical plant process control software, contracted in 2012 and still in active use
4. Supporting more than 40 languages and dialects, including 13 COBOL dialects and mainframe technologies such as CICS, IMS, VSAM and JCL

## Three Questions for Modernization Buyers:

Dr. Baxter recommends that CIOs and agency leaders ask three questions of any modernization provider, whether AI-based or human-led:

1. Does running the translation twice produce the same code?
2. Can every change be traced back to a defined rule?
3. If the output is wrong, how will the error be found before production?

## Assessment and Deployment

Organizations can submit a codebase under mutual NDA for an assessment. It includes a complexity analysis, an automation estimate and a rough timeline, delivered within agreed upon timelines. For classified and regulated environments, DMS can be deployed on-premise so that no source code leaves the client's network.

## About Modernize Software

Modernize Software is the legacy modernization division of Semantic Designs, Inc., founded in Austin, Texas, in 1995 by Dr. Ira D. Baxter. Its DMS Software Reengineering Toolkit combines symbolic AI and compiler technology for deterministic, auditable code transformation, accelerated by generative AI for analysis, documentation and testing. The company serves organizations in aerospace and defense, financial services, telecommunications,

semiconductors, industrial manufacturing and government. More information is available at <https://modernizesoftware.com>.

#### Related Resources

- [DMS Transformation Platform](#)
- [What Is COBOL Modernization?](#)
- [COBOL to Java Migration Services](#)

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