AI help to untangle a knotty affair



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ChatGPT and Claude Code could soon be used to upgrade mainframe computers, the backbone of banks. **Mathures Paul** explains

The computer programming language COBOL was created in 1959 to solve a pressing problem: the high cost of programming because, in those days, programs had to be custom-written for each machine. Six decades later, billions of lines of Common Business-Oriented Language still run on mainframe computers (**a 1970 version in photo below**), ensuring that the work of many financial institutions and government agencies continues without a hiccup. But there is a problem; the programmers who know COBOL are ageing.

Now, OpenAI may have a solution. Last month, the company behind ChatGPT said "substantial improvements" in its latest AI models' abilities can help migrate ageing software to modern code.

According to IBM, COBOL supports over 40 per cent of online banking systems, 80 per cent of in-person credit card transactions and 95 per cent of ATM transactions. Fortran, another legacy programming language, is used in weather forecasting and nuclear reactor safety analysis.

Migrating software is no easy task. GPT-6 Astra achieves an average test pass rate of 87.4 per cent across 20 programming languages, but COBOL is harder to crack, with Astra's pass rate at 72.1 per cent. That is still a substantial improvement over GPT-5.6 Sol, which managed 26.8 per cent.

Brookings, a nonpartisan public policy organisation, estimated in a 2024 report that COBOL's inefficiencies cost the US GDP around $105 billion a year. OpenAI has said that its models can help migrate "COBOL programs to C++, Java, Kotlin, Python or Rust while preserving what each program does".

COBOL gained popularity because it was unlike any other programming language. Since it was meant to be written in English, even non-programmers could take an interest in it. Its simplicity led some to believe the language was intended to replace computer programmers, who were a highly specialised group in the 1960s. The people behind COBOL wanted it to generate its own documentation, making programs easier to maintain in the long run. As a *Wired* deep dive notes: "COBOL was implemented with a piece of logic that grew to be despised: the GO TO statement, an unconditional branching mechanism that sent you rocketing from one section of a program to another."

OpenAI is not the only company trying to untangle the knotty affair that is COBOL. Earlier this year, AI start-up Anthropic said its Claude Code tool could be used to modernise COBOL, which is widely used on IBM mainframes across banking, insurance and government systems.

Last year, the programming language drew unexpected attention when Elon Musk was running his so-called Department of Government Efficiency (DOGE) for US President Donald Trump. At an Oval Office press conference, he claimed that a "cursory examination of Social Security, and we got people in there that are 150 years old... They should be in the *Guinness Book of World Records*.

AI & You



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That figure, computer programmers pointed out, was a quirk of the US Social Security Administration's benefits system, which was largely written in COBOL. Since it does not have a date type, some implementations count all dates from a fixed reference point. The most commonly used is May 20, 1875, the date on which 17 nations signed the Metre Convention in Paris to create the International Bureau of Weights and Measures.

The Covid-19 pandemic highlighted just how important COBOL programmers remain. The US state of Oklahoma was trying to implement the CARES Act as quickly as possible, but some claims were taking as long as two weeks to process because of a mainframe computer that ran COBOL. In 2020, *Bloomberg* reported that the average COBOL programmer was over 60. When Gartner took a count in 2004, it found two million experts in the language and estimated that the number was falling by 5 per cent a year.

OpenAI has not fully cracked migration. "We evaluate our models on hidden tests that require byte-for-byte parity on observable outputs. A migration is considered successful only if all tests pass. Behaviour-preserving capabilities like these are useful for teams maintaining and modernising older systems, though applying it to production software still requires expert review and testing against the system's business rules and dependencies," the company said.