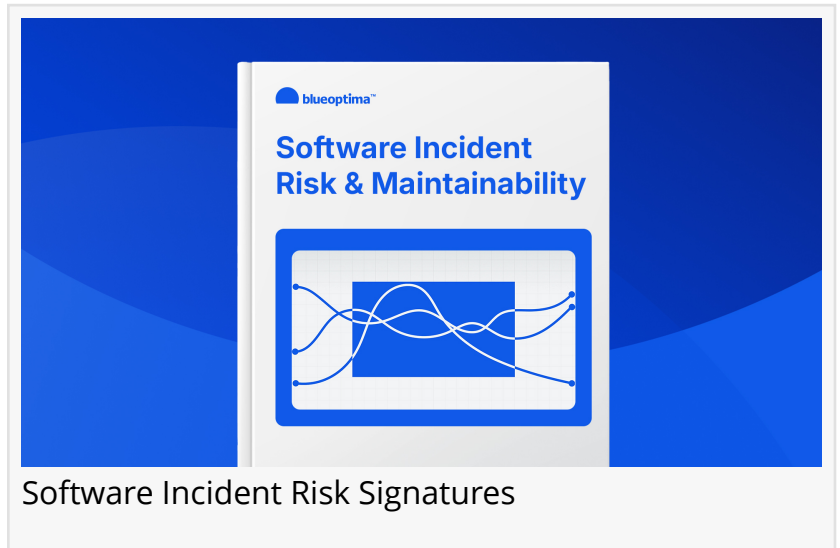


New BlueOptima Research Analyzes 666,000 Code Revisions to Identify Software Incident Risk Factors

Analysis of 666,000 code revisions finds software incidents become significantly more likely and costly as maintainability declines.

LONDON, UNITED KINGDOM, June 25, 2026 /EINPresswire.com/ -- LONDON, UNITED KINGDOM — [BlueOptima](#) announced the release of its latest research report, [Software Incident Risk Signatures](#): A Large-Scale Analysis of Maintainability Metrics and Stability, examining the software engineering conditions most strongly associated with production incidents across large enterprise environments.



Based on an analysis of more than 666,000 source code revisions across thirteen major enterprises, the study finds that [software incidents](#) are not random operational events. Instead, they are associated with measurable patterns in code maintainability, repository health, technical debt accumulation, and software delivery processes.

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Software incidents aren't random. The data shows that declining maintainability creates measurable risk that organizations can identify earlier.”

Jason Mackay, CRO at BlueOptima

The research arrives at a time when Generative AI adoption is accelerating software development activity across enterprises worldwide. While productivity has increased significantly, the report identifies evidence of a growing productivity-maintainability tradeoff, where higher development output coincides with declining code

maintainability and increased operational risk.

Among the report's findings:

- Software incident volumes increased significantly during 2025, including a 111% year-over-year increase in Q2 2025 and a 58% year-over-year increase in Q3 2025.
- Incident recovery times increased sharply over the same period, with average resolution times rising from 2 hours to 22 hours in Q2 and from 7 hours to 31 hours in Q3.
- Incidents occurring in the least maintainable quartile of code required a median of 65.2 hours to resolve, compared with just 1.7 hours in the most maintainable quartile—a 38-fold difference.
- Core backend technologies accounted for more than half of all incident remediation effort, highlighting the importance of maintainability in critical business systems.
- BlueOptima's machine learning model identified 74% of incident-linked code revisions within the historical dataset used for model fitting, demonstrating that incident-prone changes exhibit recognizable risk patterns.

The report introduces a five-tier risk framework that combines static source code analysis with behavioral engineering signals, including developer tenure, repository characteristics, file age, and pull request review friction. Together, these factors help identify code changes that historically exhibited elevated incident risk.

"Engineering leaders are under pressure to deliver software faster than ever, but speed alone is not a measure of success," said Jason Mackay, CRO at BlueOptima. "This research shows that maintainability is one of the strongest indicators of operational risk and long-term software stability."

The findings suggest that many organizations remain focused on detecting issues after software reaches production rather than proactively identifying risk during development. According to the report, engineering teams can reduce incident exposure by incorporating maintainability controls earlier in the software delivery lifecycle.

The report recommends five practical actions for engineering organizations:

- Implement automated maintainability gates within CI/CD pipelines.
- Expand shared ownership of high-risk code areas.
- Introduce touch-and-clean controls for aging files.
- Audit low-scrutiny review approvals.

- Monitor the productivity-maintainability tradeoff associated with AI-assisted software development.

As enterprises continue investing in AI-powered software delivery, the report argues that maintainability should be treated as a strategic operational metric alongside productivity, velocity, and deployment frequency.

The full report, *Software Incident Risk Signatures: A Large-Scale Analysis of Maintainability Metrics and Stability*, is available at:

https://www.blueoptima.com/resource/software-incidents-arent-random-why-maintainability-matters?utm_source=einpresswire&utm_medium=press_release&utm_campaign=software_incident_risk_signatures

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BlueOptima provides enterprise software intelligence solutions that help organizations improve software development performance, code quality, operational resilience, and engineering productivity. Through Developer Analytics, Code Insights, and Predictive Assessment capabilities, BlueOptima enables engineering leaders to make data-driven decisions that improve software delivery outcomes.

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