



The Impact of GenAI On Code Development.

See how AI is reshaping the structural risk of your software estate



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**AI is making your
developers faster.**

**It could also be degrading
your codebase.**



Scope of the Research.

We analyzed data from:

- **18 enterprises**
- **21,000 developers**
- Multi-year performance
- 2025 longitudinal adoption

The goal was to measure how licensed AI usage effects:

- **Output**
- Code **quality**
- Structural **maintainability**

Here's what we found →

Productivity Increased.

Data from 18 enterprises shows:

+4.74% productivity

for active developers with AI licenses

VS

-2.25% productivity

for non-licensed peers



13.33%

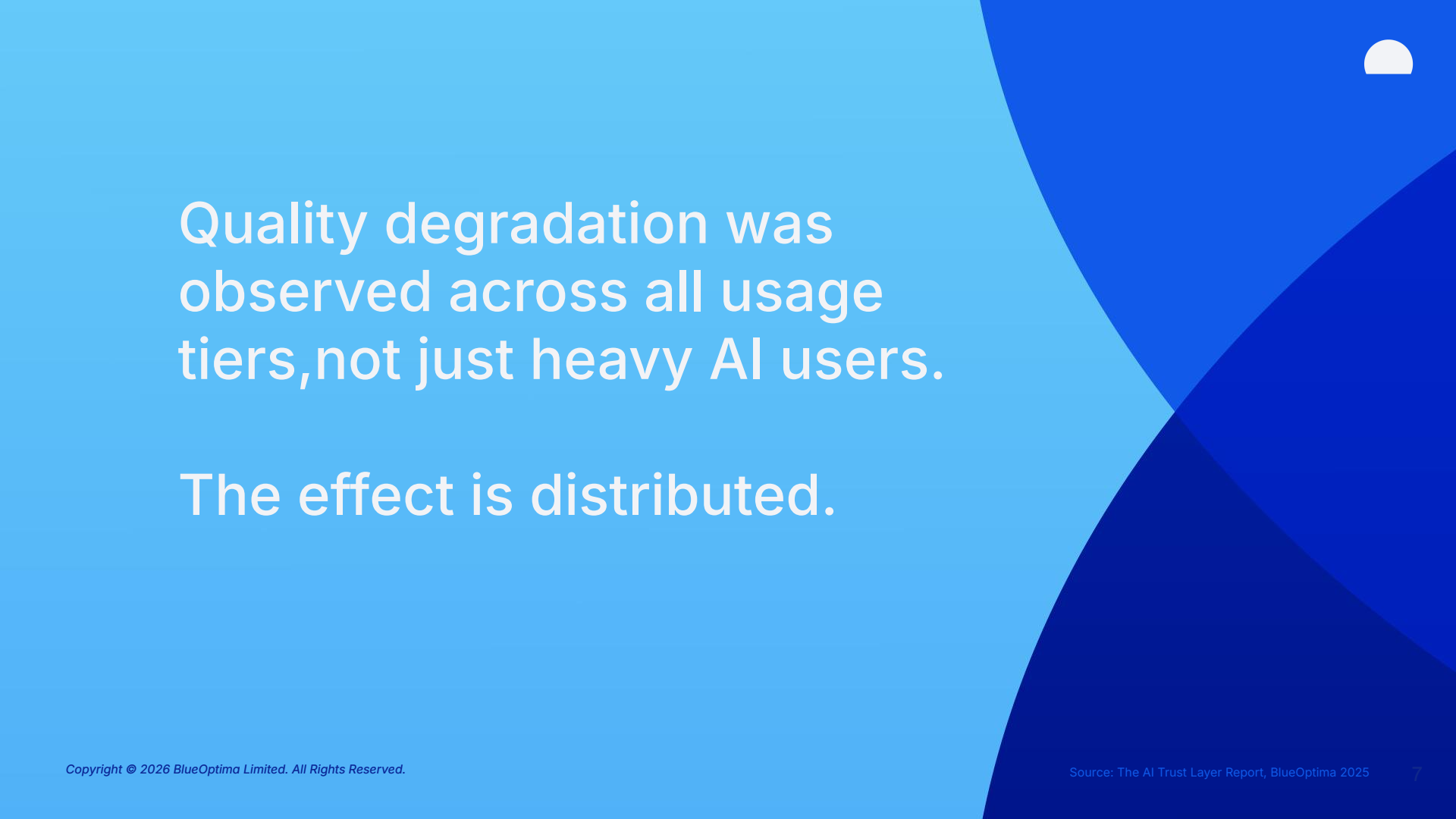
productivity gains for
heavy AI users

Code Quality Declined.

Active licensed developers saw:

+4.21% increase in structurally complex,
hard-to-maintain code

More than double the control group
increase (+1.70%)



Quality degradation was
observed across all usage
tiers, not just heavy AI users.

The effect is distributed.

AI Adoption is Reshaping The Entire Software Estate.

In 2025 we saw a gradual but cumulative shift.

~3% → ~10% of total coding effort

AI-generated contribution rose

95.25% → 94.75%

Enterprise Quality Score declined

37.5% → 43.5% of active files

Maintainability issues increased

Risk is Migrating Into Extreme Outlier Territory.

Structural issues are compounding

+ 51% cyclomatic complexity

+ 55% low structural quality

+ 17% high file size

Safe-zone files (0-70th percentile) are shrinking.

Outlier files (>95th percentile) are growing.

Monthly Trend of Proportion of files with Maintainability Issues

Percentage of Files with HTF Issues Over Time



Speed today can become maintenance drag tomorrow.



**AI is generating an
increasing share of
enterprise code.**

**But it doesn't share
accountability.**

Why This Data Matters.

1.

Productivity gains mask quality decline

Higher effort per change reduces delivery capacity over time, eroding the gains AI creates

2.

Risk is systemic

When structural risk is distributed, migrations, upgrades, and large initiatives become slower and more expensive.

3.

Accountability remains human

Leaders are responsible for outages, security, and ROI – even as AI writes a growing share of the code.

How Leading Teams Are Controlling GenAI Risk.



Quality Gate Reviews

Catch and correct potential issues early to ensure code stays maintainable and high quality.



Usage Tiers & Pilots

Start with controlled pilot programs so you can assess their impact, identify best practices, and refine governance models.



Governance Frameworks

Include clear guidance for teams on using GenAI code, focusing on both productivity and quality safeguards.



Training & Awareness

Keep developers informed on how best to use AI, the risks of automation bias, and the importance of maintaining code.



Leaders need to answer:

Is faster output sustainable?

Is structural risk increasing?

Can we defend our AI investment?

Usage metrics can't answer these questions.

The Measurement Layer For AI Impact.

As AI adoption becomes standard, organizations need evidence to understand what it's doing to their codebase.

BlueOptima makes AI's impact **visible**, **measurable**, and **defensible**.



Measure Output

Coding Effort gives you an objective unit of delivered work



Track Structural Risk

Aberrant Coding Effort and File-Level Maintainability metrics reveal quality issues before they ship



Prove ROI

Cost per Unit of Coding Effort gives you board-ready numbers to compare and defend



Govern AI Contributions

Code Author Detection gives you full visibility over who or what is writing your code



Want to Know More? Get the In-Depth Data.

Access our full report into GenAI's impact on software development for the methodology and research behind this summary.

Find out if your AI investment is building speed or structural debt.
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