

The Impact of Next-Gen AI on Talent, and Software Development

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Introduction

This thesis investigates how **next-generation Artificial Intelligence (AI)**—particularly large language models (LLMs) and AI-assisted development tools like Q developer—is transforming **software development productivity, and team structures**. Through a mixed-methods approach combining literature review, surveys, interviews, and an embedded real-world case study, the research provides empirical evidence that AI significantly enhances productivity and reduces cost, while **augmenting rather than replacing human roles**. The study demonstrates that AI-assisted development can reduce effort and cost by **approximately 40–55%** for medium- to high-complexity tasks, improve code quality, and accelerate time-to-market. At the same time, it highlights the growing importance of **human-AI collaboration**, governance, and continuous up skilling to ensure sustainable adoption.

Subsection description

Human-AI Collaboration

Rather than full automation, the study reveals an emerging **human-in-the-loop model** where:

- AI accelerates initial solution development
- Humans provide context, judgment, and validation This collaboration improves consistency, quality, and innovation but requires clear governance, ethical safeguards, and training to prevent over-reliance on AI outputs.

Skill Evolution and Role Redefinition

The integration of AI shifts workforce demands away from repetitive programming toward:

- System and solution design
- Prompt engineering and AI interaction
- Architectural validation and governance

The research confirms that **“a good developer becomes a good prompter”**, reinforcing that AI enhances human capability rather than replacing it. Entry-level and routine roles are most affected, while higher-order skills grow in importance.

Productivity, Delivery Acceleration and Code Quality Analysis

AI-assisted tools significantly improve software delivery efficiency by automating code generation, testing, debugging, and optimization.

Key outcomes observed in the case study include:

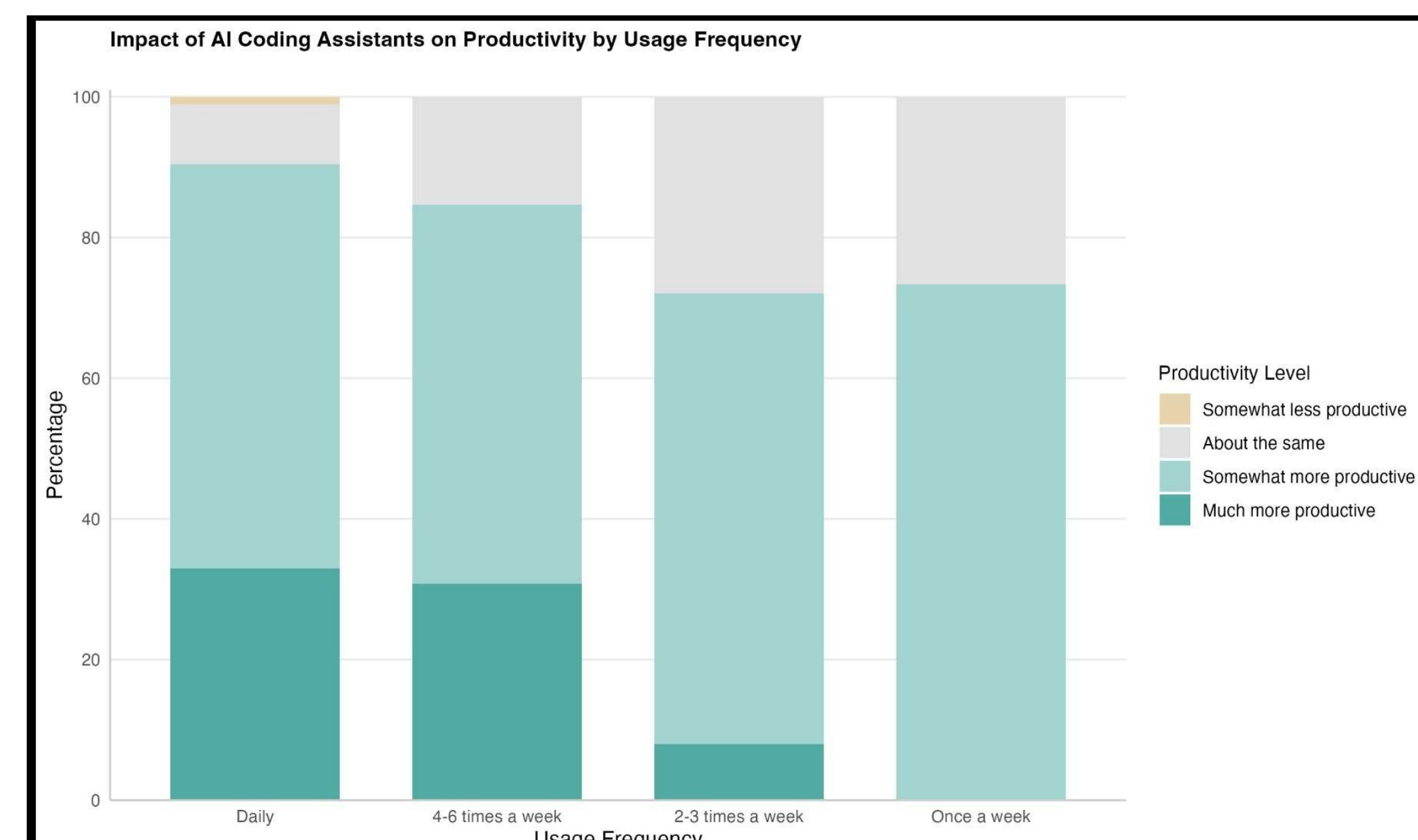
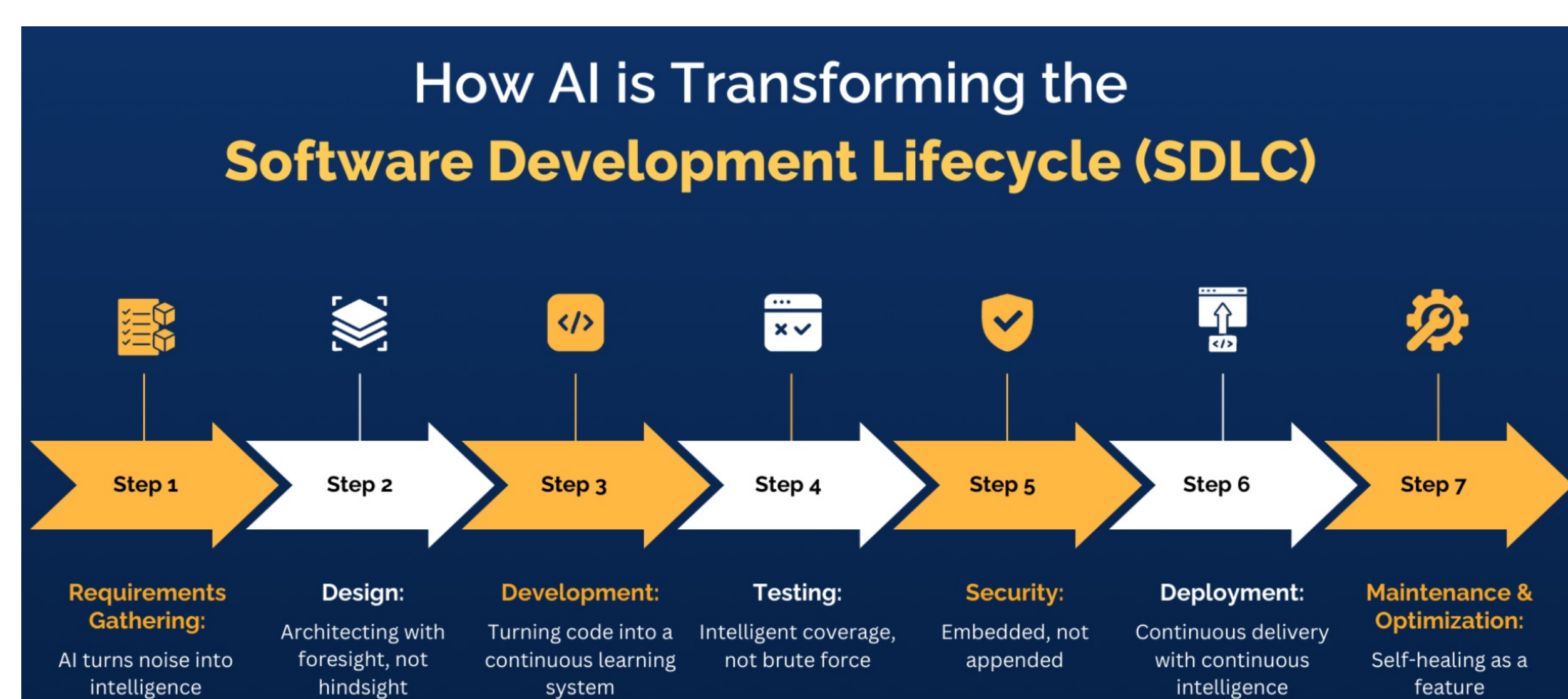
1. **40–50% reduction in development effort.**
 2. **Approx 67% cost savings** across analyzed work items
 3. **Faster CI/CD cycles and fewer rework iterations**
- These gains enable teams to focus more on design decisions and solution quality rather than routine coding.

A quantitative evaluation was conducted to compare software code quality produced through manual development and AI-assisted development using next-generation AI tools. Code quality was assessed using automated static analysis integrated within the CI/CD pipeline, primarily leveraging SonarQube metrics. AI-generated code achieved a higher maintainability rating (**Grade A**) compared to manually written code (Grade B).

The average number of code smells per component decreased from **approximately 22** in manual code to **6 in AI-assisted code**, representing a reduction of **45–55%**. Cyclomatic complexity scores were reduced from an average range of **14–18** in manual code to **7–10** in AI-generated code. Estimated technical debt per component decreased from approximately **2.8 hours** to 1.0 hour, reflecting a reduction of **60–65%**.

In CI/CD execution, AI-assisted code passed quality gates in a single iteration, whereas manually developed code required an average of three iterations. All AI-generated components successfully passed build and test stages without additional rework. These results indicate a consistent and measurable improvement in code maintainability, complexity, and delivery stability when AI-assisted development is applied.

Topic Overview



Conclusions and Future Work

Next-generation AI **substantially improves productivity, cost efficiency, and code quality** in software development.

AI adoption leads to **job augmentation, not displacement**, with humans transitioning into coordinators, reviewers, and designers of AI-generated solutions.

Successful AI integration depends on **effective prompting, human oversight, governance models, and continuous learning**.

Organizations that strategically combine AI capabilities with human expertise gain a sustainable competitive advantage.

QR Code for Recording

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