Unlocking the Potential: Exploring the Impact of Integration of Generative Artificial Intelligence in Agile Software Engineering

How does integrating generative AI into Agile software teams reshape productivity, code quality, and collaboration? What organizational conditions maximize its benefits while minimizing ethical and workflow disruptions?

Pawan Anand's dissertation investigates how generative AI (GenAI) tools affect Agile software engineering across two complementary studies. In the qualitative phase, 23 senior IT leaders and Agile coaches were interviewed about real-world GenAI adoption. Using grounded theory, Anand condensed four core themes: measurable productivity gains, shifts in team collaboration, governance and ethical concerns, and implementation challenges at scale.

The quantitative phase surveyed 260 Agile practitioners from diverse industries. Respondents rated GenAI's impact on sprint speed, task rework reduction, organizational support, and collaboration. Multiple linear regression showed that reductions in task rework ($\beta = 0.469$, $p < 0.001$) and faster sprints ($\beta = 0.390$, $p < 0.001$) were the strongest predictors of overall efficiency gains. Organizational endorsement alone had no significant direct effect ($\beta = 0.079$, $p = 0.294$). Notably, collaboration disruptions emerged as a drag on efficiency ($\beta = –0.220$, $p = 0.002$). Survey data also revealed that 57 percent of teams saw moderate time savings, 21 percent saw large improvements, and 43 percent flagged AI bias and transparency issues.

Together, these findings suggest that GenAI can be a powerful productivity multiplier when considerately integrated. Success centres on automating redundant work and accelerating sprints while maintaining clear governance, bias mitigation, and team training. Organizations should invest in ethics frameworks, upskilling, and infrastructure to harness GenAI's promise without undermining Agile collaboration.

MAJOR TAKEAWAYS:

- Reducing task rework via GenAI automation is the single strongest driver of Agile team efficiency gains ($\beta = 0.469$).
- Faster sprints boost productivity, but collaboration disruptions from AI tools can undermine overall performance ($\beta = –0.220$).
- Organizational buy-in alone is insufficient; success requires ethical governance, bias mitigation, and deliberate upskilling.

WHO NEEDS TO KNOW:

- Technology Executives
- Project Managers
- AI Ethics Teams

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