

Literature Review: Improving Software Quality in Agile Development Environments Using Artificial Intelligence Tools

Course Title: Research Methodology in Computer Science

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Table of Contents

1. Abstract
2. Literature Review
3. Summary Table
4. Conclusion
5. References

Abstract

This paper talks about how Artificial Intelligence (AI) can help improve software quality in Agile projects. AI tools like Machine Learning (Random Forest, XGBoost), Neural Networks, and NLP can find bugs early, check code automatically, and make tests easier. But there are problems like data quality and making AI easy to understand.

Literature Review

Here are some studies I found:

1. AI for Agile Development (2023) Summary: Shows how AI supports Agile tasks like planning and testing. Strength: Covers many ideas. Weakness: Not much real data.
2. AI-Driven Innovations (2025) Summary: Talks about AI improving code and debugging. Strength: Good examples. Weakness: Not always about Agile.
3. Generative AI in Agile (2025) Summary: How GenAI helps in planning, coding, and testing. Strength: Explains phases. Weakness: No long-term results.
4. AI Techniques in Agile (2023) Summary: Lists AI tools used in Agile. Strength: Organized. Weakness: Few experiments.
5. NLP for User Stories (2023) Summary: Uses NLP to check user stories for quality. Strength: Tested in projects. Weakness: Language issues.
6. Predictive Quality with ML (2025) Summary: Uses XGBoost to predict bugs and save time. Strength: Good accuracy. Weakness: Only one company.

Summary Table

Year	Title	Method	Weakness
2023	AI for Agile	Review	Few numbers
2025	AI Innovations	Review	Not always Agile
2025	GenAI in Agile	Review	No long-term
2023	AI Tools	Mapping	Few tests
2023	NLP Stories	Case study	Language issues
2025	ML Quality	Case study	One company

Conclusion

AI is useful for Agile because it saves time and improves quality. Future work should make AI easier to understand and test it in more projects.

References

- 1- Cabrero-Daniel, B. (2023). AI for Agile Development: A Meta-Analysis.
- 2- Alenezi, M., & Akour, M. (2025). AI-Driven Innovations in Software Engineering.
- 3- Cornide-Reyes, H., et al. (2025). Generative AI in Agile Software Development.
- 4- Peras, D., et al. (2023). AI Techniques and Tools in Agile Software Development.
- 5- Ahmed, M., et al. (2023). NLP-based Quality Attributes Extraction.
- 6- Christadoss, J., et al. (2025). Predictive Quality Analytics Using ML.