



Risk management supported by AI/ML in software development projects using agile methodologies

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Agenda

- + Introduction to Project Management Methodologies
- + Transition to Agile Methodologies
- + Risk Management in Software Development
- + AI/ML in Risk Management
- + AI/ML in Agile Software Development
- + AI/ML in Testing and Factoring
- + Modern Project Management Approaches
- + Case Studies and Practical Examples
- + Q&A

Introduction to Project Management Methodologies

- + Traditional Waterfall Model: Characteristics and Limitations.
 - [Systems Engineering Handbook – NASA](#)
- + V-Model as an Extension: Emphasizing Verification and Validation.
 - [ESA - Requirements and standards](#)

Transition to Agile Methodologies

- + Introduction to Agile Principles: Iterative Development and Flexibility.
 - [Spotify engineering culture \(part 1\) - Spotify Engineering : Spotify Engineering \(atspotify.com\)](#)
- + Comparative Analysis: Agile vs. Waterfall.
- + Scrum Framework: Roles, Ceremonies, and Artifacts.

Risk Management in Software Development

- + Definition and Importance of Risk Management.
- + Traditional Risk Management vs. Agile Risk Management.
 - [IBM Responsibility Report – Governance – Risk Management | IBM](#)

AI/ML in Risk Management

+ The Role of AI/ML in Enhancing Risk Identification and Analysis (Rafeek et al., 2019).

- Rafeek, M.A. & Arbain, Adila & Sudarmilah, Endah. (2019). Risk mitigation techniques in agile development processes. *International Journal of Supply Chain Management*. 8. 1123-1129.

+ AI/ML for Predictive Analysis and Decision-Making Support (Pilliang et al., 2022).

- Pilliang, M., , M., Tjahjono, B., Sejati, P., Akbar, H., & Firmansyah, G. (2022). Criticism of the Risk Management Process in Scrum Methodology. *2022 International Conference on Electrical and Information Technology (IEIT)*, 338-343. <https://doi.org/10.1109/IEIT56384.2022.9967893>.

AI/ML in Risk Management

+ Challenges and Limitations of AI/ML in Risk Management (Canhoto & Clear, 2020).

- Canhoto, A., & Clear, F. (2020). Artificial intelligence and machine learning as business tools: A framework for diagnosing value destruction potential. *Business Horizons*, 63, 183-193. <https://doi.org/10.1016/j.bushor.2019.11.003>.

AI/ML in Agile Software Development

- + Integration of AI/ML with Agile Practices (Dam et al., 2018).
 - Dam, K., Tran, T., Grundy, J., Ghose, A., & Kamei, Y. (2018). Towards Effective AI-Powered Agile Project Management. 2019 IEEE/ACM 41st International Conference on Software Engineering: New Ideas and Emerging Results (ICSE-NIER), 41-44.
<https://doi.org/10.1109/ICSE-NIER.2019.00019>
- + AI/ML for Continuous Integration and Continuous Deployment in Agile (Granlund et al., 2021).
 - Granlund, T., Stirbu, V., & Mikkonen, T. (2021). Towards Regulatory-Compliant MLOps: Oravizio's Journey from a Machine Learning Experiment to a Deployed Certified Medical Product. SN Computer Science, 2. <https://doi.org/10.1007/s42979-021-00726-1>
 - [Learning From Netflix. Best Practices to Build Tech Stack — CI/CD Pipeline](#)

AI/ML in Testing and Factoring

- + ML for Automated Testing: Improving Efficiency and Coverage.
 - Test case generation and prioritization
- + AI-Assisted Refactoring: Code Quality and Technical Debt Reduction.
 - Finding and fixing software bugs automatically with SapFix and Sapienz (meta.com)

Modern Project Management Approaches

- + Agile at Scale: Addressing the Needs of Large, Complex Projects.
 - SAFe (Scaled Agile Framework)
- + DevOps and MLOps: Integrating Development, Operations, and Machine Learning.
 - Streamlined workflows
 - Automate and monitor ML model deployments
 - [Meet Michelangelo: Uber's Machine Learning Platform | Uber Blog](#)

Case Studies and Practical Examples

- + Microsoft's AI Workflow Process Adapted to Agile (Begel, 2019).
 - Begel, A. (2019). Best Practices for Engineering AI-Infused Applications: Lessons Learned from Microsoft Teams. 2019 IEEE/ACM Joint 7th International Workshop on Conducting Empirical Studies in Industry (CESI) and 6th International Workshop on Software Engineering Research and Industrial Practice (SER&IP), 1-1. <https://doi.org/10.1109/CESSER-IP.2019.00008>
 - [Driving Microsoft's transformation with Data and AI](#)
- + Agile Risk Management Using Software Agents (Odzaly et al., 2018).
 - Odzaly, E., Greer, D., & Stewart, D. (2018). Agile risk management using software agents. Journal of Ambient Intelligence and Humanized Computing, 9, 823-841. <https://doi.org/10.1007/s12652-017-0488-2>

Conclusions

- + Summarizing the Role of AI/ML in Agile Risk Management.
- + Future Trends and Research Directions.
 - AI-driven project management tools.
 - Increased automation in risk assessment.



Q&A

