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Artificial Intelligence-Driven Task Prioritization and Resource Scheduling in Agile Software Development Environments

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Abstract: *Agile software development emphasizes flexibility, rapid iterations, and continuous delivery of high-quality software. However, managing task prioritization and resource allocation effectively remains a persistent challenge due to dynamic requirements, shifting priorities, and varying team capacities. This study explores the use of Artificial Intelligence (AI) techniques, including machine learning, predictive analytics, and natural language processing, to optimize task prioritization and resource scheduling in Agile environments. By analyzing historical project data, team performance metrics, and backlog information, the AI-driven system provides intelligent recommendations for task sequencing and resource assignment. The proposed approach enhances sprint planning accuracy, improves resource utilization, reduces task completion times, and identifies potential bottlenecks before they impact project delivery. The integration of AI into Agile workflows allows teams to make data-driven decisions while maintaining the flexibility and responsiveness that Agile methodologies demand, ultimately leading to improved productivity, higher-quality outcomes, and more predictable project timelines.*

Keywords: Artificial Intelligence, Task Prioritization, Resource Scheduling, Agile Software Development, Machine Learning

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