

AI Powered Integrated Code Repository Analyzer for Efficient Developer Workflow

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Transitioning between new and legacy codebases in diverse project environments poses significant challenges for developers, especially with traditional Knowledge Transfer (KT) methods, which are often resource intensive and prone to obsolescence. These limitations hinder the Software Development Life Cycle (SDLC), particularly in fast-paced industrial settings. This research introduces an AI-driven automation solution that leverages large language models (LLMs) and advanced artificial intelligence technologies to address critical gaps in technical knowledge transfer, with a focus on modern software frameworks. The proposed system reduces development costs, improves team performance, and accelerates adaptation to complex codebases. Key features include a documentation generation tool that cuts manual effort by up to 90%, with an average generation time of 6.8 minutes. Additionally, a virtual knowledge transfer assistant enhances onboarding efficiency, potentially reducing senior developer involvement by 50-60%. The system also includes an automated diagram generator that achieves 97% validation accuracy and a code smell detection tool with 71% accuracy, resulting in better code quality assessments. These findings demonstrate the effectiveness of AI-driven automation in improving developer productivity, streamlining onboarding processes, and optimizing software development workflows.

Keywords: *AI automation, code summarization, large language model, SDLC, software development*