ABSTRACT

Rapid digital transformation initiatives are often hindered by unmaintainable software systems, which increase complexity and technical debt. A key challenge is ensuring the maintainability of front-end application code, which, if neglected, can impede long-term product evolution and scalability. This research aims to investigate the impact of implementing Clean Architecture on a front-end codebase to improve its maintainability. To analyze this impact, a front-end application for an Audit Trail Management System was designed and developed, with its code quality quantitatively validated using SonarQube. The results show that the Clean Architecture implementation successfully achieved an 'A' maintainability rating, supported by a Technical Debt Ratio of less than 5%. This study validates that applying Clean Architecture in front-end development effectively produces a highly maintainable codebase, reduces complexity, and builds a robust foundation for sustainable development in support of successful digital transformation.

Keywords: *audit trail, clean architecture, project management, digital transformation, maintainability, transparency*