

ABSTRAK

PENERAPAN TEST DRIVEN DEVELOPMENT PADA APLIKASI ANDROID SISTEM INFORMASI PETANI HUTAN (STUDI KASUS DINAS KEHUTANAN PROVINSI LAMPUNG)

Oleh

THEOFANI HATI KUSUMAWARDANI

Dinas Kehutanan Provinsi Lampung menghadapi tantangan aksesibilitas dalam pelaporan data Nilai Transaksi Ekonomi (NTE) akibat keterbatasan konektivitas internet dan keterbatasan perangkat yang dimiliki di lapangan. Pengembangan aplikasi dengan fungsionalitas *offline-first* diperlukan dalam menghadapi tantangan tersebut, namun manajemen data *offline* dan logika sinkronisasi memiliki tingkat kompleksitas yang tinggi, sehingga berisiko meningkatkan *bug* dan menurunkan keterpeliharaan (*maintainability*) sistem di masa depan. Penelitian ini bertujuan membangun aplikasi *offline-first* android Sitanihut dengan penerapan metode *Personal Extreme Programming* (PXP) dan pendekatan *Test Driven Development* (TDD). Hasil pengembangan selama enam iterasi menunjukkan bahwa penerapan TDD dengan total 563 *unit test* menghasilkan *code coverage* sebesar 95,53%. Evaluasi kompleksitas logika menghasilkan skor McCabe *Cyclomatic Complexity* sebesar 2,36 dan kompleksitas pemahaman kode *Cognitive Complexity* sebesar 1,77, membuktikan rendahnya kompleksitas kode yang dibangun. Pengujian akhir melalui *User Acceptance Test* (UAT) menghasilkan skor sebesar 100% atau dapat diterima dari tiga kelompok pengguna.

Kata kunci: *Android, Offline-first, Personal Extreme Programming, Test Driven Development, Code Coverage, Cyclomatic Complexity, Cognitive Complexity, User Acceptance Test*

ABSTRACT

TEST DRIVEN DEVELOPMENT IMPLEMENTATION ON MOBILE ANDROID APPLICATION FOR SISTEM INFORMASI PETANI HUTAN (CASE STUDY: DINAS KEHUTANAN PROVINSI LAMPUNG)

By

THEOFANI HATI KUSUMAWARDANI

Dinas Kehutanan Provinsi Lampung faces accessibility challenges in reporting Economic Transaction Value (NTE) data due to limited internet connectivity and limited devices available in the field. Application development with offline-first functionality is necessary to address these challenges, but offline data management and synchronization logic have a high level of complexity, thus risking increasing bugs and reducing system maintainability in the future. This study aims to build an offline-first android application Sitanihut by implementing the Personal Extreme Programming (PXP) method and the Test Driven Development (TDD) approach. The development results for six iterations show that the application of TDD with a total of 563 unit tests resulted in a code coverage of 95.53%. The evaluation of logic complexity resulted in a McCabe Cyclomatic Complexity score of 2.36 and a Cognitive Complexity code understanding complexity of 1.77, proving the low complexity of the code built. Final testing through the User Acceptance Test (UAT) resulted in a score of 100% or acceptable from three user groups.

Keywords: Android, Offline-first, Personal Extreme Programming, Test Driven Development, Code Coverage, Cyclomatic Complexity, Cognitive Complexity, User Acceptance Test