

## ABSTRAK

Abian Nanda Rahman Nugraha, 2026. Rancang Bangun Sistem Simulasi dan Estimasi Kebutuhan Beton Berbasis Website (Studi Kasus: PT Satwiga Mustika Naga). *Skripsi*. Program Studi Teknik Informatika, Fakultas Teknik, Universitas PGRI Madiun. Pembimbing: (I) Sri Anardani, S.Kom., M.T., (II) Saifulloh, S.Kom., M.Kom.

Proses estimasi beton di PT Satwiga Mustika Naga saat ini masih semi-manual, sehingga rentan memicu ketidakkonsistenan rumus, risiko human error, dan keterlambatan laporan proyek. Penelitian ini bertujuan untuk merancang dan membangun Sistem Simulasi dan Estimasi Kebutuhan Beton berbasis website sebagai solusi integratif otomatisasi perhitungan material beton di lapangan. Sistem dikembangkan menggunakan metode Agile dengan spesifikasi teknologi framework Laravel, Vue.js, Inertia.js, dan basis data MySQL. Data pendukung dihimpun melalui observasi, wawancara, studi pustaka, serta kuesioner dengan teknik sampling jenuh (sensus) kepada 6 responden (3 engineer, 2 admin, dan 1 pimpinan). Aplikasi ini menyediakan tiga modul kalkulasi utama: Quick Cast, Road Calculator, dan Building Calculator. Hasil pengujian fungsionalitas menggunakan Black-Box Testing terhadap 15 skenario uji menunjukkan tingkat keberhasilan 100% (valid) dan bebas dari kesalahan logika. Sistem ini juga sukses menerapkan fitur cetak laporan PDF menggunakan library Dompdf, sehingga mampu mempercepat proses dokumentasi dan standarisasi pelaporan proyek di PT Satwiga Mustika Naga.

**Kata Kunci:** *Agile*, Estimasi Beton, *Laravel*, Simulasi Website

## ABSTRACT

*Abian Nanda Rahman Nugraha, 2026. Design and Development of a Web-Based Concrete Simulation and Estimation System (A Case Study: PT Satwiga Mustika Naga). Thesis. Informatics Engineering Study Program, Faculty of Engineering, Universitas PGRI Madiun Advisors: (I) Sri Anardani, S.Kom., M.T., (II) Saifulloh, S.Kom., M.Kom*

*The concrete estimation process at PT Satwiga Mustika Naga is currently conducted in a semi-manual manner, making it highly susceptible to formula inconsistencies, human errors, and delays in project reporting. This study aims to design and develop a web-based Concrete Simulation and Estimation System as an integrative solution to automate material calculations in the field.*

*The system was developed using the Agile methodology, utilizing Laravel, Vue.js, and Inertia.js frameworks, with a MySQL database. Supporting data was gathered through observation, interviews, literature review, and questionnaires using a saturation sampling (census) technique with 6 respondents (3 engineers, 2 administrators, and 1 manager). The application provides three main calculation modules: quick cast, road calculator, and building calculator. The functional evaluation using Black-Box Testing across 15 test scenarios demonstrated a 100% success rate (valid), proving that the system is free from logical errors. Additionally, the system successfully implements a PDF report printing feature powered by the Dompdf library, thereby expediting documentation processes and standardizing project reporting at PT Satwiga Mustika Naga.*

**Key Note :** Agile, Concrete Estimation, Laravel, Simulation, Website