

# RANCANG BANGUN APLIKASI *MOBILE* SIMULASI INVESTASI PINTAR DAN PREDIKSI SAHAM SEKTOR EKONOMI DIGITAL BERBASIS LSTM

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## ABSTRAK

Meningkatnya jumlah investor pasar modal Indonesia yang mencapai 14.001.651 SID pada 2024 tidak diimbangi kesiapan investor pemula dalam mengambil keputusan investasi. Survei terhadap 41 responden menunjukkan 78% takut salah mengambil keputusan, 58,5% tidak memiliki tempat berlatih secara *trial-error*, dan 97,6% menilai penting adanya pengalaman berlatih sebelum menggunakan uang sungguhan. Permasalahan ini diperparah oleh belum tersedianya aplikasi simulasi investasi yang menargetkan saham sektor ekonomi digital sekaligus mengintegrasikan sistem prediksi berbasis kecerdasan buatan dan manajemen risiko otomatis. Penelitian ini bertujuan merancang dan membangun aplikasi *mobile* Android simulasi investasi pintar berbasis *Long Short-Term Memory (LSTM)* yang berfokus pada saham sektor ekonomi digital, yaitu DCII, EDGE, dan MTEL, menggunakan metode *Rapid Application Development (RAD)*. Aplikasi dibangun dengan Kotlin *Native* Android berarsitektur *MVVM* pada *frontend*, *FastAPI* berbasis Python yang di-*deploy* pada *Google Cloud Run* untuk *backend*, serta Supabase sebagai *database*. Fitur utama meliputi simulasi jual-beli saham dengan algoritma *Order Matching Price-time priority*, prediksi harga penutupan saham menggunakan *LSTM*, rekomendasi investasi berbasis analisis teknikal *Bollinger bands*, *RSI*, dan *MACD*, serta fitur *Auto Stop loss* dan *Take profit* berbasis *Average True Range (ATR)*. Pengujian dilakukan bertahap melalui *Unit Testing* (PyTest dan JUnit), *Integration Testing* (Postman), dan *system testing* menggunakan *Black Box Testing* di lingkungan produksi. Hasil pengujian terhadap 33 skenario pada 6 modul fungsional menunjukkan tingkat keberhasilan 100%, membuktikan seluruh fitur aplikasi berjalan sesuai spesifikasi dan algoritma *Order Matching* berhasil divalidasi fungsionalitasnya dengan baik.

**Kata Kunci:** *Long Short-Term Memory*, *Order Matching*, Prediksi Harga Saham, Simulasi Investasi

# DESIGN AND DEVELOPMENT OF A SMART INVESTMENT SIMULATION MOBILE APPLICATION AND STOCK PREDICTION IN THE DIGITAL ECONOMY SECTOR USING LSTM

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## ***ABSTRACT***

*The growing number of capital market investors in Indonesia, reaching 14,001,651 SIDs in 2024, has not been matched by novice investors' readiness to make sound investment decisions. A survey of 41 respondents found that 78% feared making wrong decisions, 58.5% had no place to practice through trial-and-error, and 97.6% considered hands-on practice important before using real money. This problem is worsened by the absence of an app targeting digital economy sector stocks while integrating AI-based prediction and automated risk management. This study aims to design and develop an Android smart investment simulation app based on Long Short-Term Memory (LSTM), focusing on digital economy sector stocks, namely DCII, EDGE, and MTEL, using the Rapid Application Development (RAD) method. The app was built with Kotlin Native Android using MVVM architecture on the frontend, Python-based FastAPI deployed on Google Cloud Run for the backend, and Supabase as the database. Main features include stock trading simulation using a Price-time priority Order Matching, closing price prediction using LSTM, investment recommendations based on Bollinger bands, RSI, and MACD, and Auto Stop loss/Take profit based on Average True Range (ATR). Testing included Unit Testing (PyTest and JUnit), Integration Testing (Postman), and Black Box system testing in production. Results across 33 scenarios covering 6 functional modules showed a 100% success rate, proving all features work as specified and confirming successful validation of the Order Matching.*

**Keywords:** Long Short-Term Memory, Order Matching, Stock Price Prediction, Investment Simulation