

## **ABSTRACT**

**Rahma Nadila Ulfa, NIM. 7212650001, *Design of an Automated Trading System Based on an Expert Advisor with a Combination of MACD and Stochastic Indicators for the Nasdaq-100 Index (US100): Performance Analysis Using the Spiral Model in MetaTrader 5***

*This research aims to design and performance evaluation of an Automated Trading System (Expert Advisor) integrated with a combination of the Moving Average Convergence Divergence (MACD) and Stochastic Oscillator technical indicators on the NASDAQ-100 (US100) Index instrument. The methodology employed is the Spiral Model, enabling iterative development and structured performance validation. The Swing Trading strategy was implemented across H1 and H4 timeframes, with testing comprising extensive backtesting (2022–2025) and focused real-time testing (May - June 2025). The performance results demonstrate superior system robustness, evidenced by a consistent Win Rate above 94% and highly controlled Maximal Drawdown (MDD), ranging from 0.51% to 0.82% of the initial balance. Statistical analysis using the Independent Samples T-Test confirmed no significant difference in Profit per trade between the simulated and actual market environments ( $p > 0.05$ ). Conversely, a highly significant difference was found for the Balance variable ( $p < 0.001$ ), indicating that cumulative capital performance is highly sensitive to live market execution variables such as fluctuating slippage and spreads. This research recommends incorporating long-term trend filters to mitigate false signals during consolidation phases.*

**Keywords:** *Expert Advisor (EA), MACD, Stochastic Oscillator, NASDAQ-100 (US100), Spiral Model, Performance Analysis*

## ABSTRAK

**Rahma Nadila Ulfa, NIM. 7212650001, Perancangan Sistem Trading Otomatis Berbasis Expert Advisor Dengan Kombinasi Indikator Macd Dan Stochastic Pada Indeks Nasdaq-100 (US100): Analisis Kinerja Menggunakan Spiral Model Di Metatrader 5**

Penelitian ini memaparkan perancangan dan evaluasi kinerja Sistem Perdagangan Otomatis (Expert Advisor) yang terintegrasi dengan kombinasi indikator teknikal Moving Average Convergence Divergence (MACD) dan Stochastic Oscillator pada instrumen Indeks NASDAQ-100 (US100). Metodologi yang digunakan adalah Spiral Model, yang memungkinkan pengembangan iteratif serta validasi kinerja yang terstruktur. Strategi Swing Trading diterapkan pada kerangka waktu H1 dan H4, dengan pengujian yang melibatkan backtesting (2022–2025) dan real-time testing (Mei–Juni 2025). Hasil evaluasi kinerja membuktikan robustness sistem yang superior, ditandai dengan Win Rate konsisten di atas 94% dan Maximal Drawdown (MDD) yang sangat terkendali, berkisar antara 0.51% hingga 0.82% dari saldo awal. Analisis statistik menggunakan Uji-T Sampel Independen mengonfirmasi bahwa Profit per transaksi tidak menunjukkan perbedaan signifikan antara lingkungan simulasi dan pasar aktual ( $p > 0.05$ ). Namun, terdapat perbedaan yang sangat signifikan pada variabel Balance ( $p < 0.001$ ), yang mengindikasikan bahwa kinerja akumulasi modal sangat sensitif terhadap variabel eksekusi pasar *live* seperti *slippage* dan *spread* yang berfluktuasi. Penelitian ini merekomendasikan penambahan filter tren jangka panjang untuk mitigasi sinyal palsu pada kondisi pasar konsolidasi.

**Kata Kunci:** *Expert Advisor (EA), MACD, Stochastic Oscillator, NASDAQ-100 (US100), Spiral Model, Performance Analysis*