

ANALISIS DAN PERBAIKAN KEAMANAN SISTEM INFORMASI PENCATATAN HASIL PANEN SAWIT MENGGUNAKAN METODE *PENETRATION TESTING*

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ABSTRAK

Keamanan aplikasi web pada sektor agribisnis menjadi aspek krusial seiring meningkatnya digitalisasi pencatatan hasil panen, termasuk Sistem Informasi Pencatatan Hasil Panen Sawit (SawitGoDigi) di Kecamatan Bengkalis yang belum pernah diuji keamanannya secara menyeluruh sehingga berpotensi menimbulkan kebocoran data, penyalahgunaan akses, dan gangguan layanan. Penelitian ini bertujuan menganalisis dan memperbaiki keamanan sistem menggunakan metode penetration testing berbasis OWASP Top 10 dengan pendekatan *grey-box* pada tahap identifikasi dan *white-box testing* pada tahap perbaikan, mencakup identifikasi kerentanan, *remediation*, dan *retesting*. Evaluasi risiko dilakukan menggunakan OWASP Risk Rating Methodology berdasarkan parameter *likelihood* dan *impact* dengan skala 1–9. Hasil pengujian mengidentifikasi empat kerentanan utama, yaitu *SQL Injection* (skor 9, *High*), *Broken Authentication* mencakup kelemahan OTP dan *brute force* login (skor 9, *High*), *Weak Session Management* (skor 9, *High*), serta *Security Misconfiguration* pada HTTP *security headers* (skor 2, *Low*). Setelah diterapkan perbaikan berupa parameter binding, validasi OTP berbasis identitas dan peran, *rate limiting*, regenerasi *session identifier*, dan penambahan HTTP *security headers*, seluruh kerentanan berhasil ditutup dan tidak dapat dieksploitasi kembali. Penelitian ini berkontribusi berupa model pengujian keamanan yang mengintegrasikan identifikasi, perbaikan, dan verifikasi dalam satu siklus untuk meningkatkan keamanan aplikasi web sektor agribisnis.

Kata Kunci: *penetration testing*, OWASP Top 10, keamanan aplikasi web, evaluasi risiko, sistem informasi sawit.

SECURITY ANALYSIS AND IMPROVEMENT OF THE OIL PALM HARVEST YIELDS RECORDING INFORMATION SYSTEM USING THE PENETRATION TESTING METHODE

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ABSTRACT

Web application security has become a critical issue in the agribusiness sector due to the increasing digitalization of harvest recording systems, including the Palm Oil Harvest Recording Information System (SawitGoDigi) in Bengkalis District, which had never undergone a comprehensive security assessment and faced risks of data leakage, unauthorized access, and service disruption. This study analyzes and improves system security using a penetration testing approach based on OWASP Top 10, combining grey-box testing for identification and white-box testing for remediation, covering vulnerability identification, remediation, and retesting. Risk evaluation used the OWASP Risk Rating Methodology with a likelihood-impact scale of 1–9. Four vulnerabilities were identified: SQL Injection (score 9, High), Broken Authentication including OTP weaknesses and brute force login (score 9, High), Weak Session Management (score 9, High), and Security Misconfiguration in HTTP security headers (score 2, Low). After remediation, all vulnerabilities were closed and could not be exploited under the same scenarios. This study contributes an integrated security testing model combining identification, remediation, and verification within a single cycle.

Keywords: *penetration testing, OWASP Top 10, web application security, risk evaluation, palm oil information system.*