

ABSTRAK

Aldeva Rizky Winanto Pratama Putra. 2026. Pengembangan Sistem Pakar Analisis Capaian Pembelajaran Lulusan (CPL) Menggunakan Metode Pembobotan dan *Rule-Based*. Skripsi. Program Studi Teknik Informatika, FT, Universitas PGRI Madiun. Pembimbing (I) Sri Anardani, S.Kom., M.T. (II) Puguh Jayadi, S.Kom., M.Kom.

Proses analisis ketercapaian Capaian Pembelajaran Lulusan (CPL) di Program Studi Teknik Informatika Universitas PGRI Madiun masih dilakukan secara manual menggunakan spreadsheet tidak terintegrasi, sehingga rentan kesalahan input, membutuhkan waktu lama, dan hasilnya sering terlambat dijadikan dasar evaluasi kurikulum. Penelitian ini bertujuan merancang, membangun, mengimplementasikan, dan menguji Sistem Pakar Analisis CPL menggunakan metode pembobotan dan *rule-based* berbasis web dengan *framework Laravel*. Metode pengembangan yang digunakan adalah *Waterfall* dengan pemodelan sistem menggunakan *Unified Modeling Language* (UML) meliputi *Use Case Diagram*, *Activity Diagram*, *Sequence Diagram*, dan *Class Diagram*. Sistem dirancang untuk tiga peran pengguna yaitu Admin, Dosen, dan PMPS, dengan struktur basis data 22 tabel menggunakan *MySQL*. Sistem mampu melakukan kalkulasi pembobotan kontribusi setiap mata kuliah terhadap CPL secara otomatis dan menggunakan mesin inferensi *rule-based* untuk menentukan status ketercapaian CPL, dengan hasil analisis yang dapat diekspor dalam format Excel maupun PDF. Pengujian *Black Box Testing* menghasilkan 92 kasus uji dengan keberhasilan 100% Valid, sedangkan *White Box Testing* dengan metode *basis path testing* menghasilkan 19 dari 19 jalur *independen PASS*. Hasil tersebut membuktikan seluruh fungsionalitas dan logika inti sistem telah berjalan dengan benar, sehingga sistem mampu menggantikan proses evaluasi CPL manual menjadi proses yang terstandar, otomatis, dan efisien.

Kata Kunci: Sistem Pakar, Capaian Pembelajaran Lulusan, Metode Pembobotan, *Rule-Based*, *Laravel*, *Black Box Testing*, *White Box Testing*

ABSTRACT

Aldeva Rizky Winanto Pratama Putra. 2026. *Development of an Expert System for Graduate Learning Outcomes (CPL) Analysis Using Weighting and Rule-Based Methods*. Thesis. Informatics Engineering Study Program, Faculty of Engineering, Universitas PGRI Madiun. Advisor (I) Sri Anardani, S.Kom., M.T. Co-Advisor (II) Puguh Jayadi, S.Kom., M.Kom.

The process of analyzing the achievement of Graduate Learning Outcomes (CPL) in the Informatics Engineering Study Program at Universitas PGRI Madiun was still carried out manually using non-integrated spreadsheets, making it prone to input errors, time-consuming, and often delayed in serving as a basis for curriculum evaluation. This study aimed to design, develop, implement, and test an Expert System for CPL Analysis using weighting and rule-based methods in a web-based application built with the Laravel framework. The development method used was Waterfall, with system modeling using Unified Modeling Language (UML) covering Use Case Diagram, Activity Diagram, Sequence Diagram, and Class Diagram. The system was designed for three user roles, namely Admin, Lecturer, and PMPS, supported by a database structure of 22 tables using MySQL. The system is capable of automatically calculating the weighting of each course's contribution to CPL and employing a rule-based inference engine to determine CPL achievement status, with analysis results exportable in Excel and PDF formats. Black Box Testing produced 92 test cases with a 100% Valid success rate, while White Box Testing using the basis path testing method yielded 19 out of 19 independent paths PASS. These results prove that all functionalities and core logic of the system have operated correctly, enabling the system to replace the previously manual CPL evaluation process with one that is standardized, automated, and efficient.

Keywords: *Expert System, Graduate Learning Outcomes, Weighting Method, Rule-Based, Laravel, Black Box Testing, White Box Testing*