

ABSTRAK

MAKHYANA ULYA ROSYADI. Penerapan metode *prototyping* dalam perancangan sistem manajemen uji kompetensi dengan fitur generatif berbasis LLM (Studi kasus: SMKN 1 Tangerang). Dibimbing oleh Muhammad Fadli Prathama, S.Si., MMSi.

Transformasi digital dalam tata kelola Lembaga Sertifikasi Profesi (LSP) menjadi kebutuhan penting untuk meningkatkan efisiensi dan akurasi administrasi uji kompetensi, khususnya pada tahap pra-asesmen administratif. LSP SMKN 1 Tangerang masih menghadapi permasalahan dalam pengelolaan data peserta yang dilakukan secara manual, seperti keterlambatan validasi, potensi kesalahan input, serta kesulitan dalam pengelolaan registrasi dan penjadwalan. Kondisi ini berdampak pada kurang optimalnya pelayanan dan efektivitas proses sertifikasi kompetensi.

Penelitian ini bertujuan merancang dan membangun Sistem Manajemen Uji Kompetensi berbasis web yang terintegrasi *Artificial Intelligence* (AI) menggunakan Gemini API untuk mendukung administrasi pra-asesmen. Metode yang digunakan adalah *Research and Development* (R&D) dengan model *Prototyping*, sehingga sistem dikembangkan secara bertahap berdasarkan umpan balik pengguna. Pengumpulan data dilakukan melalui observasi, wawancara, dokumentasi, dan kuesioner berskala Likert. Integrasi AI dimanfaatkan untuk membantu analisis serta validasi otomatis data peserta, sehingga meminimalkan kesalahan dan mempercepat proses verifikasi.

Hasil penelitian menunjukkan bahwa sistem yang dikembangkan mampu meningkatkan efisiensi proses administrasi, mempercepat validasi data, serta mengurangi kesalahan input manual secara signifikan. Berdasarkan hasil *User Acceptance Test* (UAT), sistem dinilai mudah digunakan, fungsional, dan sesuai kebutuhan operasional LSP. Dengan demikian, penelitian ini berkontribusi dalam penerapan teknologi web dan kecerdasan buatan untuk mendukung manajemen uji kompetensi di pendidikan vokasi serta menjadi referensi pengembangan sistem serupa pada LSP lainnya.

Kata kunci : LSP, Uji Kompetensi, Sistem Manajemen, Pra-Asesmen, Web-Based, Artificial Intelligence, Prototyping, Gemini API

ABSTRACT

MAKHYANA ULYA ROSYADI. *Application of the Prototyping Method in the Design of a Competency Test Management System with LLM-Based Generative Features (Case Study: SMKN 1 Tangerang)*. Under the Guidance of Muhammad Fadli Prathama, S.Si., MMSi.

Digital transformation in the governance of Professional Certification Bodies (LSP) has become essential to improve efficiency and accuracy in competency test administration, particularly in the pre-assessment administrative stage. LSP SMKN 1 Tangerang still faces challenges in managing competency test participant data manually, including delays in data validation, potential input errors, and difficulties in handling registration and scheduling processes. These issues affect service quality and reduce the overall effectiveness of the certification process.

This study aims to design and develop a web-based Competency Test Management System integrated with Artificial Intelligence (AI) using the Gemini API to support pre-assessment administrative processes. The research method employed is Research and Development (R&D) with a Prototyping model, allowing the system to be developed iteratively based on user feedback. Data collection techniques include observation, interviews, documentation, and questionnaires using a Likert scale. AI integration is utilized to assist in automated analysis and validation of participant data, thereby minimizing errors and accelerating the verification process.

The results indicate that the developed system significantly improves administrative efficiency, speeds up data validation, and reduces manual input errors. Based on the User Acceptance Test (UAT), the system is considered user-friendly, functional, and aligned with the operational needs of the LSP. Therefore, this research contributes to the implementation of web technology and artificial intelligence in supporting competency test management in vocational education and serves as a reference for developing similar systems in other Professional Certification Bodies.

Keywords : ***LSP, Competency Test, Management System, Pre-Assessment, Web-Based, Artificial Intelligence, Prototyping, Gemini API***