INTISARI

PENGEMBANGAN REKOMENDASI ONTOLOGI BERBASIS ANALYTIC HIERARCHY PROCESS UNTUK INTEGRASI ONTOLOGI KALENDER TANAM

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Representasi pengetahuan formal dapat dilakukan melalui pembangunan ontologi yang mendukung interoperabilitas data dan kolaborasi lintas disiplin. Namun, integrasi ontologi sering terkendala dalam pemilihan kandidat yang tepat dan relevan untuk digunakan kembali, terutama ketika ontologi berasal dari domain yang beragam dan heterogen. Dalam penelitian ini dikembangkan kerangka kerja rekomendasi ontologi berbasis *Analytic Hierarchy Process* (AHP) untuk mengevaluasi dan merekomendasikan kandidat ontologi berdasarkan lima kriteria kualitas: *believability, consistency, interlinking, understandability,* dan *richness*.

Sebanyak 443 ontologi dikumpulkan dari tiga repositori dan disaring menjadi 44 kandidat untuk dievaluasi. Hasil rekomendasi menunjukkan kerangka kerja ini mampu memberikan peringkat prioritas yang relevan, dengan validasi menggunakan Pearson Correlation Coefficient (PCC) sebesar 0,2751. Meskipun nilainya rendah, hasil ini lebih baik dibandingkan metode sebelumnya dan menunjukkan hubungan positif terhadap penilaian pakar.

Sepuluh ontologi dengan prioritas tertinggi diintegrasikan menjadi Ontologi Kalender Tanam (O-Katam) melalui tahapan identifikasi kelas utama, pemetaan relasi, penyusunan hierarki konsep, penggabungan, dan evaluasi menggunakan Protégé. Ontologi hasil integrasi mencakup 178 kelas, 80 objek properti, 58 data properti, dan 230 individu. Evaluasi menunjukkan O-Katam konsisten, memiliki *inheritance richness* sebesar 1,0618 dan *cohesion* 0,8217, serta validasi pakar sebesar 81,25%, yang menegaskan kualitas struktur hierarki, keterhubungan instan, dan kelengkapan pengetahuan dalam kalender tanam.

Kata kunci: Rekomendasi Ontologi, Analytic Hierarchy Process (AHP), Integrasi Ontologi, Pertanian.

ABSTRACT

DEVELOPMENT OF ONTOLOGY RECOMMENDATION USING ANALYTIC HIERARCHY PROCESS FOR PLANTING CALENDAR ONTOLOGY INTEGRATION

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Formal knowledge representation can be achieved through the development of ontologies that support data interoperability and cross-disciplinary collaboration. However, ontology integration often faces challenges in selecting appropriate and relevant candidate ontologies for reuse, particularly when they originate from diverse domains with heterogeneous structures.

This study proposes an ontology recommendation framework based on the Analytic Hierarchy Process (AHP) to evaluate and recommend candidate ontologies according to five quality criteria: believability, consistency, interlinking, understandability, and richness. A total of 443 ontologies were collected from three repositories and filtered into 44 candidates for evaluation. The recommendation results demonstrate that the framework can provide relevant prioritization, validated using the Pearson Correlation Coefficient (PCC), which yielded a value of 0.2751. Although the value is relatively low, it outperforms previous methods and indicates a positive correlation with expert assessments.

The ten highest-ranked ontologies were then integrated into the Planting Calendar Ontology (O-Katam) through stages of main class identification, relation mapping, concept hierarchy construction, merging, and evaluation using Protégé. The integrated ontology consists of 178 classes, 80 object properties, 58 data properties, and 230 individuals. Evaluation results show that O-Katam is consistent, with an inheritance richness of 1.0618 and cohesion of 0.8217. Expert validation of completeness reached 81.25%, confirming the quality of the hierarchical structure, inter-instance connectivity, and knowledge coverage of the planting calendar domain.

Keywords: Ontology Recommendation, Analytic Hierarchy Process (AHP), Ontology Integration, Agriculture.