

Decoding Human Resources: Representing and Rationalizing HR Knowledge

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Abstract

The ongoing digitalization trend across industries, driven by advancements in Big Data and Machine Learning technologies, has led to profound changes in business models. In fact, the human resources sector has experienced significant impacts, particularly in aligning job openings with suitable candidates. Despite the prevailing emphasis on technology, the potential advantages of employing description logic methods have been largely overlooked. This study addresses this gap by providing a comprehensive overview of how the human resources industry utilizes knowledge bases in ontologies. The research sheds light on the benefits and complexities of integrating ontological frameworks into the sector, enhancing its operational efficiency and analytical capabilities.

Keywords: Data engineering, Human Resources, Big Data

1 Introduction

In human resources, meticulous personnel selection is a critical factor that guides organizational operations, tactics, and strategies [1]. The importance of carefully choosing and integrating candidates from a diverse pool underscores its significant role in shaping an organization's future success. This emphasizes the necessity of a robust mechanism to effectively match employers with potential employees, transcending conventional recruitment methods [2]. Such a mechanism aligns individuals' skills and perspectives with organizational values, fostering innovation and productivity [3].

This process, therefore, emphasizes strategic alignment, underscoring the interplay between human capital and organizational goals. Therefore, meticulous personnel selection serves as a strategic cornerstone, synchronizing talent and aspirations to light the path toward organizational success [4].

2 Ontological Approaches to Knowledge Representation

Our ongoing efforts are exploring knowledge representation techniques centered on ontologies, which provide a formalized specification of knowledge domains. These ontologies manifest as repositories of entities, properties, relations, and domain rules [5]. The imperative for standardizing knowledge modeling is widely assumed, necessitating a notation adhering to logical specifications replete with propositional expressions and symbolic structures, such as concept hierarchies, operations, and axioms. The constructs' interpretability as propositions and their apt reflection of domain theory are of prime concern.

Description Logic (DL) is a fundamental framework emerging from efforts to formalize semantic networks and frame-based systems. Predicated semantically on predicate logic, DLs are tailored for practical modeling while preserving advantageous computational properties like decidability.

3 Structured Representation and Curated Sources

The structured representation of information and associated curated sources is an equally pivotal component. This foundation is crucial for answering queries and inferring latent knowledge [6]. Knowledge bases rooted in ontologies compile structured insights pertinent to specific domains [7]. Instances like Wordnet exemplify this approach, capturing semantic relationships like synonyms and part-whole associations [9]. The adoption of ontologies as knowledge models is underlined by its multifarious advantages:

- Mitigating semantic heterogeneity by enforcing a shared vocabulary for consistent communication between employers and candidates.
- Enabling information validation to identify inconsistencies across data furnished by both parties.
- Facilitating automated computation, capitalizing on the shortcomings of natural language understanding in surpassing explicit content.
- Enabling inferencing to deduce implicit information through reasoning mechanisms.
- Fostering interoperability across diverse databases and information systems, contingent on a common ontology framework.
- Streamlining complex queries, surpassing conventional methods' capabilities.

4 Practical and Measurable Benefits

Beyond their theoretical merits, ontologies yield pragmatic and quantifiable advantages for the industry, measurable through Key Performance Indicators (KPIs). Automated algorithms for job-candidate matching hold substantial promise for organizations with hiring needs [10]. Leveraging ontologies in the human resources realm offers:

- Cost reduction in sourcing relevant matches is particularly beneficial for high-volume recruitment.
- Enhanced job-applicant matching, uncovering hidden talents, and expanding recruiter horizons.
- Mitigated industry-specific expertise demands for HR professionals, as ontologies transcend industrial boundaries.
- Expedited preprocessing of applicant profiles via search expression preferences, yielding relevant results promptly.

5 Conclusion

Our ongoing research demonstrates the frequent application of knowledge representation methods in optimizing recruitment processes across diverse organizations. The digitization and refinement of these procedures yield multiple benefits, notably a reduction in costs, time, and effort when contrasted with traditional approaches within the HR sector [11]. Additionally, from a scientific perspective, surpassing conventional syntactic matching introduces significant prospects for investigating novel techniques and potential business models [12].

Current practices involve leveraging a knowledge base to align candidate profiles with job opportunities, often facilitated by a domain-specific ontology encompassing skills, experiences, and tasks. In the future, the application of emerging ML technologies in combination with DL should provide novel results in this direction.

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