

# Ontology Based Knowledge Extraction on Diabetic Patients and Drugs from EHRS

K. Pushpavath<sup>1\*</sup> and K. L. Shunmuganathan<sup>2</sup>

<sup>1</sup>Department of Computer Science, School of Arts and Science, Vinayaka Mission's Chennai Campus, Vinayaka Mission's Research Foundation (DU), Paiyanoor, India

<sup>2</sup>Department of Computer Science, Jaya Engineering College, Thiruninravur, Chennai

\*Corresponding author: pushpavathi.avca03@avsas.ac.in

## ABSTRACT

EHRs (Electronic Healthcare Records) keep digital records of the medical histories of various patient kinds, including geographic information. An effective way to provide and guarantee data consistency in EHR records is through ontology. With the advancement of semantic web technology, one can access ontologies to learn specifics about various diabetic patients and medications. A variety of ontologies have been created for the data in EHRs to extract information on diabetes patients, complications that may affect them, and medications. An ontology-based model for diagnosis and treatment of diabetes patients in remote healthcare systems (OMDP) provides prediction of risk level for the diabetes patient as well as its treatment using database from EHR. It does this by using 2 top level ontologies, such as BFO and OGMS, that have been combined to extract knowledge for prediction of risk level and by using SWRL rules to provide details about the treatment for the patients. By combining BFO and OGMS, a diabetic mellitus diagnosis ontology (DDO) forecasts patient problem. Although there are several EHR systems, it might be challenging to comprehend how data are integrated, analyzed, and exchanged. Interoperability between EHRs must be carried out to address this problem. In order to streamline patient care, we created the Drug Ontology Mapping Tool (DOM), which facilitates smooth data transfer across EHRs and telemedicine platforms. The use of ontology mapping techniques aids in the extraction of implicit data from various ontologies. Three ontologies, including diabetes, diabetes medications, and blood glucose levels, are employed by DOM. A diabetic ontology is also used to identify knowledge gaps and unearth fresh perspectives on this condition. On Word2Vec, BERT, and the Bilstm model, drug-based ontology mapping in electronic health records performs well. The Bilstm model outperforms the word2vec and BERT models in drug ontology mapping. The ontology mapping system for healthcare data can be made more accurate and applicable by including ontologies and domain-specific knowledge.

**Keywords:** EHR, Ontology, DOM

