

Semantic Association Rule Mining in Text using Domain Ontology

Ibukun Afolabi , Olaperi Sowunmi and Olawande Daramola .

Department of Computer and Information sciences, Covenant University, Ota, Nigeria

{ibukun.fatudimu; olaperi.sowunmi, olawande.daramola} @covenantuniversity.edu.ng

Abstract

Online news websites are now valuable archives for both current and old news regarding various issues, particularly those that relate to the political and historical contexts of a country. These news platforms have become an important medium for all forms of political activities such as branding, campaigns, and communication. Online newspapers make large volume of textual data available, which are rich in political and historical inferences that can be leveraged for national development. In this paper we report a procedure for ontology-based association rule mining for knowledge extraction from text. Ordinarily, association rule mining algorithms have the limitations of generating many non-interesting rules, huge number of discovered rules, and low algorithm performance. This research demonstrates a procedure for improving the performance of association rule mining in text mining by using domain ontology. To do this, a study context of Nigerian politics based on information extracted from a Nigerian online newspaper was selected, and a methodology that combined natural language processing methods, ontology-based keywords extraction, and the modified Generating Association Rules based on Weighting scheme (GARW) was applied. The result obtained from the study revealed that compared to non-ontology based association rule mining approaches, our procedure provides significant rule reduction in the number of generated rules, and produced rules which are more semantically related to the problem context. The study validates the capability of domain ontology to improve the performance of association rule mining algorithms, particularly when dealing with unstructured textual data.