

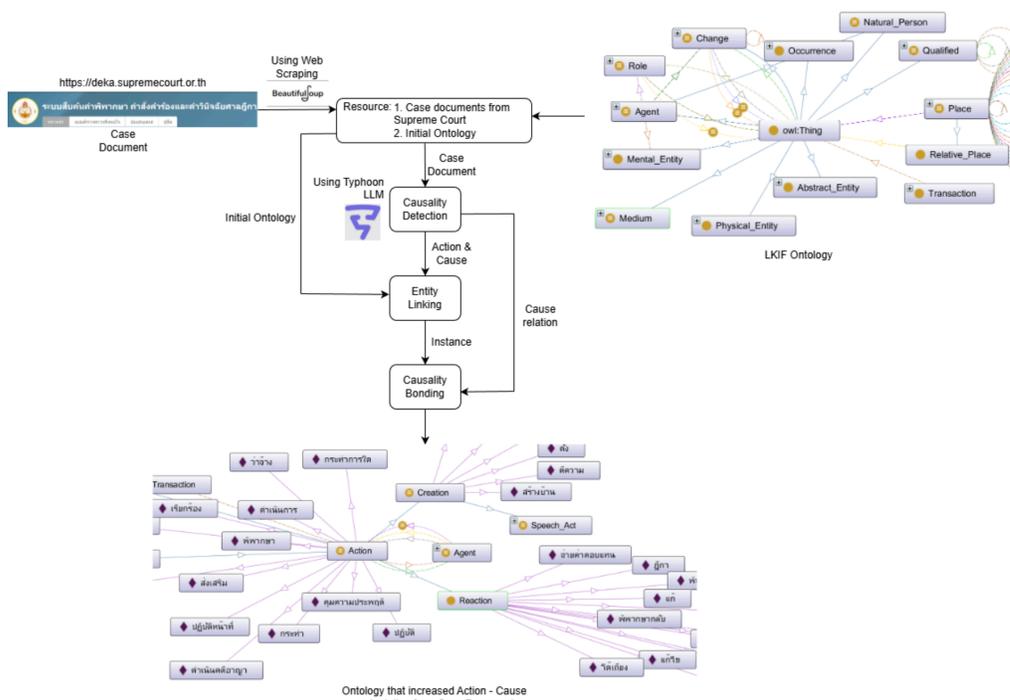
Abstract

The development of the Causality Legal Knowledge Graph aims to design and develop an ontology to store knowledge extracted from Supreme Court judgements related to the Thai Civil and Commercial Code, based on causality relationships. The research process begins with the collection of Supreme Court judgements related to the Thai Civil and Commercial Code. Then, classifying their contents to identify actions that are considered the results of specific causes to narrow down the scope of the cause. These actions and causes are then mapped as ontology instances, and the causal relationships between the action instances and their corresponding causes are established. The resulting knowledge graph can be used to retrieve related judgements by comparing the similarity of instances under the action and cause classes.

Introduction

Currently, the legal field is facing significant challenges due to the surge in legal data, increasingly complex regulations, and the expectation for precise and rapid judgements. Legal experts such as judges and lawyers must review vast amounts of information to ensure fair and reasoned outcomes. However, much of legal documents are stored in unstructured forms, and it is difficult to find adjudication that related to interested topic or facts on current cases. Consequently, there is a growing need to develop data representation and storage through Knowledge Graphs. This method will construct knowledge graph from judgement contents and connect each judgement with actions and causes of action that found in judgement content.

Methodology



Technology



Result

Result of Knowledge graph construction using LKIF Ontology and Case Document from Supreme court is follow as Legal Case Ontology. Based on the evaluation of 10 court judgements using Precision and Recall, it was found that a threshold of 0.6 yielded the optimal average performance. The evaluation was conducted by comparing the number of similar judgements retrieved from the Knowledge Graph against the ground truth. Within the 10-judgement sample set, the ground truth identified four specific judgements with legal issues similar to others. By evaluating the judgements retrieved at various threshold levels between 0.5 to 1.0 against the ground truth, the Precision, Recall, and F1-Score were calculated. The comprehensive results of this evaluation are presented in evaluation table.

Threshold	Precision	Recall	F1-Score
0.5	0.4	1	0.57
0.6	0.43	1	0.6
0.7	0.47	0.67	0.55
0.8	0.13	0.33	0.18
0.9	0.13	0.33	0.18
1	0.13	0	0.18

Evaluation table

Action	Cause	พบในคำพิพากษา
ฟ้อง	โจทก์เชื่อว่าตนมีสิทธิในที่ดินพิพาท เนื่องจากการครอบครองประโยชน์และสร้างบ้านบนที่ดินดังกล่าว	3103/2568
ฟ้อง	โจทก์ต้องการเรียกร้องค่าเสียหายที่เกิดจากการคืนรถยนต์ที่เขยื้อนที่ไม่พร้อมใช้งานตามคำพิพากษาในคดีก่อน	1759/2568

Example of wrong query

Conclusion and Future Works

This research constructs a ontology for court judgements related to the Civil and Commercial Code based on logical reasoning principles. By mapping judgements using Action and Cause relationships, the effectiveness of the developed ontology was evaluated through the retrieval of similar court judgements. Results are inaccurate is because the actions used to identify the causes include common terms found in all court judgements, making every judgement linked to these actions follow as Example of wrong query and for instances that map to the cause class, most are in the form of sentences, resulting in low similarity values for comparisons between different judgements. This research will improve ontology construction to increase accuracy of query result by improve the mapping of class action instances by avoiding mapping generic terms using natural language processing and improve the similarity comparison section between cause instances by selecting appropriate sentence embedding tools.

Reference

- [1] M.-Q. H. T.-M. N. H.-T. N. H.-T. N. Thi-Hai-Yen Vuong, Constructing a Knowledge Graph for Vietnamese Legal Cases with Heterogeneous Graphs.
- [2] R. I. Ziwei Xu, "FinCaKG-Onto: the financial expertise depiction via causality knowledge graph and domain ontology," Applied Intelligence, เล่มที่ 55, 2025.