

From Thesaurus to Ontology for AI-Ready Legislative Knowledge: A Project Report from the National Assembly Library of Korea

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Abstract

This report presents an ongoing research project commissioned by the National Assembly Library of Korea to transition its thesaurus-based controlled vocabulary system toward an ontology-based concept management system. We cover the project's goals, methodology, and current progress.

1. Introduction

The National Assembly Library of Korea has maintained a thesaurus-based controlled vocabulary system to support information retrieval and terminology standardization across all subject domains. While the thesaurus has served the Library's information system effectively, thesaurus relation types are insufficient to represent the complex, context-dependent relationships that characterize legislative and policy terminology. Transitioning to an ontology-based concept management system would enable richer semantic representation and provide a knowledge infrastructure for AI-driven legislative services.

2. Project Description and Goals

The project pursues two interconnected goals: (1) design a National Assembly-specific ontology schema derived from the existing thesaurus, and (2) establish how the resulting ontology-based knowledge structure can be integrated with the Library's AI services.

The transition will proceed in three stages: mapping existing thesaurus terms and relations to ontology concept structures using SKOS [1], extending with OWL [2] to define legislative-domain-specific relation types, and proposing research-based strategies to utilize the resulting structure for the Library's AI services.

Primary deliverables will be a legislative and policy terminology ontology schema and a final research report, supported by a sample ontology, a functional ontology management system design, and AI service integration scenarios.

3. Methodology

3.1. Ontology Schema Design

Schema design begins with a systematic analysis of the existing thesaurus, covering the distribution of relation types, hierarchical depth, and the feasibility of mapping existing

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relations to ontology concept structures. Based on this analysis, a legislative domain-specific ontology schema will be designed using the layered SKOS/OWL approach.

3.2. Sample Construction and AI Integration Scenarios

To validate the schema, a sample ontology will be constructed from actual terms drawn from the thesaurus, demonstrating the conversion pathway from thesaurus relation structures to ontology concept structures. Mapping challenges identified during sample construction will feed back into schema refinement.

AI integration scenarios will be developed examining how the ontology knowledge structure can enhance the Library's existing AI services, including Argos [3], an AI-based issue analysis platform. Specific scenarios include ontology-enhanced semantic search, automated legislative support, and policy impact analysis.

4. Progress and Achievements

The project is currently in its initial stage. Activities underway include review of background literature on ontology and semantic web standards, survey of comparable projects including EuroVoc and Korean governmental LOD initiatives, and preliminary analysis of the thesaurus. The project report presented at DCMI 2026 will reflect results from the completed project.

5. Conclusion

This project addresses a concrete infrastructure challenge at the National Assembly Library of Korea: extending a well-established thesaurus-based vocabulary system toward an ontology-based concept management system that supports richer semantic representation for AI-driven legislative services.

6. Acknowledgements

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