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Author(s)	Takhom, Akkharawoot
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## Dissertation Abstract

**Student name:** Akkharawoot TAKHOM  
**Dissertation title:** Collaborative Development Approach for Multidisciplinary Ontology:  
A Scenario-based Knowledge Construction System in Life Cycle Assessment

Creating an ontology from multidisciplinary knowledge is a challenge because it needs a number of various domain experts to collaborate in knowledge construction and verify the semantic meanings of the cross-domain concepts. Confusions and misinterpretations of concepts during knowledge creation are usually caused by having different perspectives and different business goals from different domain experts. The dissertation proposes a *community-driven ontology-based application management (CD-OAM)* framework that provides a collaborative environment with supporting features to enable collaborative knowledge creation. It can also reduce confusions and misinterpretations among domain stakeholders during knowledge construction process. I selected one of the multidisciplinary domains, which is *Life Cycle Assessment (LCA)* for our scenario-based knowledge construction. Constructing the LCA knowledge requires many concepts from various fields including environment protection, economic development, social development, etc. The output of this collaborative knowledge construction is called MLCA (multidisciplinary LCA) ontology. Based on our scenario-based experiment, it shows that CD-OAM framework can support the collaborative activities for MLCA knowledge construction and also reduce confusions and misinterpretations of cross-domain concepts that usually presents in general approach.

**Keyword:** Multidisciplinary Knowledge, User-adaptive Ontology, Life Cycle Assessment, Ontology-based Knowledge Management, Collaborative Framework