

Interdisciplinary research development in global environmental issues using experiments with ontology engineering

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To tackle with global environmental problems, collaboration among experts in all kinds of research fields is essential. Sustainability science and environmental studies which aim to deal with global environmental problems therefore are of interdisciplinary nature and should involve people with disparate backgrounds. Interdisciplinary research is a mode of research by terms or individuals that integrates information, data, techniques, tools, perspectives, concepts, and/or theories from two or more disciplines or bodies of specialized knowledge to advance fundamental understanding or to solve problems whose solutions are beyond the scope of a single discipline or area of research practice (Committee on Facilitating Interdisciplinary Research (2004)). By such natures, interdisciplinary research is pluralistic in method and focus.

How do we implement interdisciplinary research collaboration by sharing all sorts of knowledge among researchers? In order to facilitate the collaboration, the method to share differences in perspectives in an explicit manner is absolutely necessary. For example, knowledge-sharing could be ensured from the procedural aspect if we can compare the conceptual models proposed by experts in different domains. Ontology engineering, which is one of the base technologies in semantic Web technology, is a method that helps design some sort of guideline facilitating such knowledge-sharing.

In this paper we examine the effectiveness of ontology engineering in the process of collaborative research by experimental approach. Specifically, we first outline the ontology engineering approach. Second, we propose the experiment plan of the collaborative research development targeting researchers in different fields who work on sustainability science and environmental studies. For the experiments, we targeted researchers working in such fields from Research Institute for Humanity and Nature and Osaka University. Third, we show the results of the experiment and then discuss their implication based on the experiment results. Finally, we propose the scheme of information base to support facilitating the collaborative research to solve the global environment problems.

Reference:

-Committee on Facilitating Interdisciplinary Research (2004) Facilitating Interdisciplinary Research, National Academy of Sciences, National Academy of Engineering, Institute of Medicine, 332pp.

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