

University of Macau

Abstract

Context-based Translation of Constant Concept Values in E-Business

by Xin Guan

Thesis Supervisor: Assistant Professor, Jingzhi Guo

Master of E-Commerce Technology

In real-world e-business environment, business information exchange is often not limited to a single natural language environment. Due to the characteristic of cross-border international trade, e-commerce transactions are often made between different natural languages. The *Heterogeneous Concept Mapping* (HCM) of Collaborative CONcept EXchange (CONEX) supports the multilingual business information exchange between heterogeneous e-business information systems, but it has limited exploration on the issue of semantic consistency maintenance in the constant value translation. This thesis discusses this issue with a novel proposal of Contextual vAlue Translation (CAT) approach to complementing the previous HCM approach. The CAT approach provides the solutions to facilitating the multilingual translation of business concept values with semantic consensus.

By contributing a novel CAT approach, a layered framework is proposed, which provides a trichotomy of systems, designers and users. The keys to this framework are the value dictionary editing models and reified document translation models. The strategies behind the value dictionary editing models are the collaborative concept mapping and CONEX concept context analysis. By these strategies, the value dictionary editors are designed as the helper tools for the dictionary designers to collaboratively but personalizedly compile the contextual value dictionaries where the task of multilingual constant value translation can be fulfilled. The reified document translation models help the design of the context transformers on a distributed network, where the multilingual business documents are exchanged between the distributed and language-different business information contexts. In these distributed

context transformers, the context-based constant value translation service is enabled. Also, the reified document translation models contribute to users the reified document exchangers, which automatically process user's inputs and outputs for routine business information exchange.

The feasibility and features of the CAT approach have been demonstrated in a prototype implementation that provides the services of the value dictionary compilation for value semantic consistency maintenance, and the reified document transformation for accurate and automatic concept exchange and constant value translation between ad hoc e-business information contexts. Evaluation of the proposal of Contextual vAlue Translation (CAT) approach is focused on the aspect of translation quality. The experiment results shows that the CAT prototype can produce much better performance than those compared commercial translation systems for translating business concept values.