

AN ONTOLOGICAL APPROACH TO MANUFACTURING SUPPLIER DISCOVERY

Christian McArthur (cm1481@txstate.edu), Department of Computer Science
Farhad Ameri (ameri@txstate.edu), Department of Engineering Technology

ABSTRACT

In modern manufacturing, supply chains are increasingly becoming global, virtual and short-lived requiring rapid and dynamic changes to keep up with the current marketplace. A major challenge is determining suitable suppliers in a timely and accurate fashion. Current methods of finding potential suppliers have difficulties fully addressing both attributes: time and accuracy. Keyword-based search methods performed by computers can be very fast. However, without performing complicated natural language processing, it is difficult to determine the context of words in a block of text causing inaccurate results. Human domain experts are able to interpret context within a textual description as well as perform reasoning processes; this allows for highly accurate results with a small set of suppliers. As the number of suppliers increases, the time for the human expert to examine all possible suppliers increases and the potential exists for an increased number of human errors on the part of the domain expert.

The Manufacturing Service Description Language (MSDL), an ontology for formal representation of suppliers' capabilities and manufacturing services, will be presented. MSDL uses the Web Ontology Language (OWL) which allows definitions and meanings to be constructed for manufacturing concepts that are understandable by computers. A search engine has been developed that interprets the MSDL ontology. The search engine returns a ranked list of potential suppliers based upon a query and the information contained in the ontology. A comparison will be shown of the results of this search engine with the results from a pair of independent domain experts.