241d Agent-Enabled Tools for the Dynamic Data Management in Chemical Process Operations

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Agent-enabled procedures automate and systematize the communication and coordination of the operation between different units and plants. The paper illustrates applications in which the communication accounts for data available from different processes as well as for the exchange of data between service units and individual process operations. The work is making use of ontologies to conceptualize the knowledge at hand and provide for the links that are providing the data. Data mining techniques are also applied to extract the implicit and potentially useful information, and predict trends by mining the historic data. Software agents incorporate disparate information resources, coordinate complementary tasks, and facilitate the interoperation of software or application programs in the engineering environment. Process simulation, rule-base decision support, artificial intelligent technique such as artificial neural network (ANN) are integrated in this system for process analysis, data processing, process monitoring and diagnosis, process performance prediction and operation suggestion. The implementation provides for well-organized information appropriate for safe technical monitoring and able to share information. The application of the knowledge management system in chemical process industry can also help the engineers to coordinate in manufacturing execution, and provide decision support based on up-to-date information and knowledge.

Agent-enabled methods assume an increasingly important role in the knowledge management system for knowledge integration, knowledge sharing and reuse. Ontology classified the knowledge base, integrates sources of knowledge into the knowledge repository, supervise database and user interface construction, and severs as a backbone of the knowledge management system development. A flexible and systematic approach for ontology development and implementation is established in this work to support ontology creation and application in the knowledge management system. Knowledge retrieving services is developed in the knowledge management system to extract information and knowledge from various data sources. Information retrieving agents retrieve information from the knowledge repository according to the user's requirement, and provides cleaned information through information filtering.

Keywords: Knowledge management, Ontology, data mining, software agents.