Intelligent Software Agents and Industrial Applications

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Agent technology represents a new paradigm for developing industrial software applications. During the past two decades, a significant number of researchers and practitioners have been trying to apply intelligent software agents in the areas of engineering design, intelligent manufacturing, supply chain management, logistics and transportation, smart home and intelligent building. Under the context of these application areas, an agent can be defined as a software system that communicates and cooperates with other software systems to solve a complex problem that is beyond the capability of each individual software system. Intelligent software agents can be used to encapsulate existing software systems to realize legacy systems integration, represent manufacturing resources (e.g., operators, machines, robots, and cells) to implement distributed manufacturing process planning, scheduling and control, and to represent organizations to facilitate collaboration, coordination, and negotiation. This talk presents some first-hand experience in developing agent-based collaborative technologies and systems during the past 20+ years, and discusses future trends, R&D opportunities and challenges.