

Abstract

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Development of Business Process Model Notations for Cloud Manufacturing Architecture (BMPN)

Cloud manufacturing is a new paradigm that provides on-demand manufacturing services, by implementing the concept of sharing resources and capabilities from different provider's worldwide using internet of things and supporting technologies. Previous researchers have introduced different cloud manufacturing architectures which explained the logical flow and combination of cloud manufacturing resources. It is noticed that there is a gap between the middleware service layer and the application layer. These two layers need an additional layer between them that makes developers of applications understand and communicate effectively with the service layer and all lower layers. This paper analyzes elements and requirements for cloud manufacturing and proposes a new architecture that includes a business process modeling (BPM) layer to bridge this gap. Furthermore, a model was developed using business process model and notations (BPMN) tool to model, and virtualize process steps for the proposed BPM layer in the cloud manufacturing architecture. Automotive industry is used as a case study to clarify the developed BMPN workflow and investigate expected manufacturing issues.