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A Framework for Event-Based Monitoring of Business Processes in the Supply Chain Management of Industry 4.0

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Abstract : In modern supply chains, large numbers of SKU (Stock-Keeping-Unit) need to be timely managed, and any delays in noticing disruptions of items often limit the ability to defer the impact on customer order fulfillment. However, in supply chains of IoT-connected enterprises, the ERP (Enterprise-Resource-Planning), the MES (Manufacturing-Execution-System) and the SCADA (Supervisory-Control-and-Data-Acquisition) systems generate large amounts of data, which generally glean much earlier notice of deviations in the business process steps. That is, analyzing these streams of data with process mining techniques allows the monitoring of the supply chain business processes and thus identification of items that deviate from the standard order fulfillment process. In this paper, a framework to enable event-based SCM (Supply-Chain-Management) processes including an overview of core enabling technologies are presented, which is based on the RAMI (Reference-Architecture-Model for Industrie 4.0) architecture. The application of this framework in the industry is presented, and implications for SCM in industry 4.0 and further research are outlined.

Keywords : cyber-physical production systems, event-based monitoring, supply chain management, RAMI (Reference-Architecture-Model for Industrie 4.0)
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