Application of BPMN-based workflow tools for Six Sigma process maps

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Abstract

Six Sigma (6σ) is a globally established approach for the continuous improvement of production or service processes. Using a data- and statistic-driven approach, for example, error frequencies can be minimized and important performance characteristics can be improved to increase customer satisfaction. In 6σ DMAIC-, DMADV- and DMAEC-Projects mainly flowchart-based methods for modeling and analyzing business processes are used. These classical process modeling approaches are widely used in 6σ projects and are supported by leading 6σ process tools. However, flowcharts are less suitable for process modeling and analysis, e.g. for complex, semantically rich or concurrent process structures. For these cases, this article propagates the use of the specification language BPMN (Business Management Process Notation/ ISO/IEC 19510:2013), which is a popular, standardized notation for business process management. It will be shown, which advantages the 6σ methodology can achieve by the inclusion of modern and well-established BPM modelling techniques. Using process examples, it is explained that BPMN has more powerful language functions for mapping complex process flows than flowchart based modeling. Furthermore, BPMN modelling tools will be demonstrated, which can support e.g. a simulation, visualization and automation of 6σ – process workflows.

Keywords
Six Sigma, business process management, BPMN

Biographies

Alfred Wulff is a Professor, and Director of the Institute of Business Informatics in the Department of Management, Information and Technology at the University of Applied Sciences, Wilhelmshaven, Germany. He holds a German diploma in Mathematics. He worked for several years in large software development projects and was project manager of multinational R&D-IT projects subsidized by the European Commission. Within the scope of the European Spacecraft program COLUMBUS (European part of the ISS) he worked for the prime contractor and was responsible for the COLUMBUS Engineering Database and the Management and Technical Information System. He has published conference papers. His research interests include database management, business intelligence, Big Data, data mining, business process management and mobile solutions.

Dr. Saso Krstovski works for Ford Motor Company – Van Dyke Transmission Plant as a Lean Manufacturing Coach and Six-Sigma Master Black Belt. With over twenty years of service with Ford Motor Company, Dr. Krstovski has held a multitude of engineering assignments, which includes time working as a Test Engineer, Launch Test Engineer, and Electrical Control Engineer. During his time with Ford Motor Company, Dr. Krstovski has worked in several plant environments and skill teams such as Dearborn Tool & Die Plant, Information Technology, and has held front-line supervision roles managing hourly UAW-Ford production employees. This exposure to new work concepts within Ford has allowed Dr. Krstovski to amass a holistic approach to engineering. As such, Dr. Krstovski has gained an extensive understanding of the Six-Sigma methodologies. As a detail oriented and data-driven engineer, Dr. Krstovski is an invaluable contributor to Ford Motor Company. He is highly distinguished and skilled with problem identification and resolution to avoid time and cost expenditures.
Dr. Krstovski recently joined Lawrence Technological University as an Adjunct Professor and is currently teaching in the Engineering Department. Dr. Krstovski's research interests lie in the area of System Optimization. He continues to collaborate actively with researchers at several universities. Dr. Krstovski provides guidance globally to doctoral candidates on dissertation direction. He graduated from Lawrence Technological University with a Doctorate of Engineering in Manufacturing Systems (DEMS). In addition, to his doctorate degree, Dr. Krstovski has a Masters in Electrical Computer Controlled Systems and a Bachelor's of Science in Electrical Engineering from Wayne State University. Dr. Krstovski has authored several publications and scientific articles on various engineering topics.