

Implementation Model and Roadmap of Manufacturing Process Standardization

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Abstract

The expansion of firms of their international operations capitalizes on economies associated with standardization. Manufacturing requirements, industry agreements, or national or international policies as well as the need to operate according to standards are essential to organizations in various industries. Literatures pointed out the important to realize the strategic used of standards to achieve measurement improvement in their competitiveness on Growth, Market access, innovation and customer confidence and brand building. Therefore, the implementation of standardization is important for company development and growth.

To enhance competitiveness and maintain leadership, the implementation of industrial standardization is especially important for multinational enterprises because it can reduce maintenance cost and inventory of spare parts. Moreover, industrial standardization can facilitate the training of technicians and cross-plant sharing and support. Several multinational enterprises implement process standardization as a business tool to improve their global brand image (e.g. McDonald's/IKEA). Without standardized work, improvement activities are not manageable because the documents of standardized work are the tools that assist people in obtaining the perfect process, which is on demand, defect-free, and cost-effective. Process standardization positively affects business value by enhancing process performance and market success, and indicators such as process time, cost, and quality. Standardizing successful processes was identified by Toyota as the final step in its problem solving tool for establishing effective repeatable and predictable processes. This is also an important assessing factor for Deming prize for recognizing performance improvement on successful implementation for multinational enterprises.

Although standardization is a vital and broad field, only a limited number of references discuss the basic principles and practices as well as share guidance and practical experiences on the application and results of standardization in organizations. Consequently, the preset study creates a standardization model to support the implementation. This study identifies the critical factors to be top management and functional support, standardization team/leader, cross-plant information monitoring/sharing system and regular review on the standardization implementation for market requirement, technical planning, supply network, and core activities. The interaction between factors is illustrated in the standardization model. Each element in this model has been addressed in the case studies during the implementation of standardization. As standardization is a long-term initiative, it needs an effective review to obtain a continuous improvement to meet the current external environment.

After reviewing previous standardization implementation roadmaps and considering the structure of multinational enterprises, this paper presented a roadmap for implementing process standardization across different operations of plants in a multinational enterprise. Six Sigma is a world-renowned methodology for process improvement and variety reduction. Hence, the company adopted part of the Six Sigma methodologies, which are Define, Measure, Analyze, Improve/Implement, and Control (DMAIC), for the systematic standardization process. The developed process standards will be reviewed and revised regularly to achieve continuous improvement.

The model that was created in this study is an important tool for organizations/enterprises that consider standardization as their strategic direction. The three-level/five-stage standardization roadmap could provide a detailed approach for companies in their initiatives towards standardization. This systematic roadmap also provide an ideal example in completing the “empty area” for the implementation of company-level process standardization. At the end of the study, the findings, potential limitations, and the implications for research and practice are discussed as well. Case studies have been conducted in an international leading global plastics manufacturer in Hong Kong in order to prove the expected outcomes and benefits of process standardization. The results and the lessons learned for the case studies are highlighted and discussed.