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Publications: Paper partially published previously at AKJ 2006 logistics conference in Saarbruecken/Germany and AKJ 2007 production technology conference in Metz/France

Title: **Supply chain optimization using lean manufacturing methodologies
- Strategies, methodologies and requirements -**

Abstract:

The future of automotive OEMs and suppliers is increasingly controlled by capital markets. Regarding this, Dresdner Kleinwort Wasserstein Research wrote: *"An aggressive implementation of lean manufacturing methodologies, similar to those of the Toyota Production System, could significantly influence the attractiveness of investments and financial performance of both automotive OEMs and suppliers. It would be a sustainable support of our investment recommendation concerning this group."*

Ford of Europe has taken on this challenge by consequently implementing lean manufacturing methodologies in its own plants which in the meanwhile resulted into a leading automotive industry position concerning productivity. Yet, a focus purely on internal value chain optimization is not enough. The analysis of holistic value chains including supplier processes and downstream supply chains is necessary.

The holistic value chain optimization as practiced by Ford of Europe has set itself the target to identify and implement improvement opportunities based on the deployment of lean manufacturing methodologies. Furthermore supplier development is supported in order to achieve sustainable implementation of lean manufacturing principles. In doing so it is differentiated between Macro- and Micro-Level investigations.

The first step during a Micro-Level investigation is to assess the level of lean implementation for a clearly defined supplier manufacturing process. Data resulting from hundreds of assessments shows a significant mismatch between supplier self assessments and Ford lean manufacturing specialist results.

In order to assure an accurate and sustainable implementation of lean manufacturing concepts, an integrated strategy is required and the adherence to each individual step from start to finish is essential. As part of supply chain optimizations, Ford of Europe currently focuses primarily on Micro-level investigations and mainly operates on the second level which is concerned with the stability of lean manufacturing systems.

The value chain optimization on the Micro-level is based on a clearly defined and standardized methodology. Based on a detailed process flow analysis the calculation of lean maesurables is conducted followed by cycle time analysis and activity sampling carried out in parallel. The resulting data is the foundation for the current state value stream map. Leveraging the expertise of the Ford lean specialists and involving supplier representatives, the current state value stream map is the baseline to identify improvement opportunities and develop the future state value stream map. The implementation of the future state value stream is supported by a detailed action plan including timing. All proposed actions are assessed versus their technical feasibility as well as commercial implications.

Despite the solid lean manufacturing methodologies based on many years of experience and continuous improvement a successful and sustainable supply chain optimization is highly dependant on a number of non technical aspects amongst others:

- Willingness to challenge established processes and working methodologies
- 100% lead by senior management
- Support and cooperation of social partners (i.e. unions)
- Analysis of the complete value chain
- Continuous improvement based on stability
- Detailed and transparent data on the manufacturing process
- Concentration on manufacturing measurables
- Implementation of findings
- Partnership between OEMs and suppliers

On the long term, true competitive advantages based on supply chain improvements are only possible given a cooperative OEM-supplier optimization of the complete value chain deploying lean manufacturing methodologies.

The paper will present the theoretical framework and actual application of supply chain optimization as practiced within Ford of Europe including real live examples. Supporting tools, processes and software solutions will be presented and discussed.