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Guest Editorial

Industrial Engineering for Mechanical Engineering

One of the objectives of this Special Issue is to promote the relationship between Industrial Engineering and Mechanical Engineering considering that the effectiveness of the modern mechanical engineering is strongly conditioned by its effective and efficient organization and management that should provide acceptance by the customers in nowadays uncertain (market) environment.

This promotion of the relationship between Industrial Engineering and Mechanical Engineering is undertaken through presentation of an entire number of the journal FME Transactions containing the papers from Industrial engineering only. In other words, the objective was to strengthen the perception of how much (mechanical) engineering systems and products depend of concepts, methodologies and tools provided by Industrial Engineering in order to provide their usability in the context of customers' requirements, and in the wider context, the society's requirements.

The papers presented in this Special Issue are based on the selected papers accepted and presented at two international conferences held in Povoia de Varzim in Portugal in the beginning of November 2015, namely at the 5th International conference on Business sustainability (BS'15) and at the 4th International conference on Virtual and Networked Organizations (ViNOrg'15).

From numerous sub-areas of Industrial Engineering, the 14 papers included in this Special Issue address five areas, typical of modern Industrial Engineering related with mechanical engineering and virtually the most topical. These five areas are: 1) The New Product Development, 2) Production Management, 3) Production System Design, 4) Enterprise Management and 5) contributions to fundamental research in Industrial Engineering.

The new product development is addressed in the paper "*Approaches to product variety management assuming configuration conflict problem*" by V. Modrak, P. Krus, and S. Bednar, in which the authors present and discuss the problems of product definition which arises in mass customization where serious conflicts may occur when requirements of the customer are specified based on a wide portfolio of product modules or components.

Following seven papers refer to the area of Production Management. The subjects in this group of papers range from "pure" production operations management to modern approaches to maintenance.

The paper "*Application of Value Stream Mapping and Possibilities of Manufacturing Processes Simulations in Automotive Industry*" by D. Stadnicka and D. Antonelli, contributes to the concept of Lean

Manufacturing and prove that the Value Stream Mapping could be improved when assisted by simulation.

The next paper "*Process Mapping Improvement: Extending Value Stream Maps with Waste Identification Diagrams*" by J. D. Carvalho *et al.*, presents also a contribution to Lean Manufacturing, presenting a new technique for waste identification production and demonstrates its effectiveness in real-life environment.

The paper "*Measuring and Managing Operational Risk in Industrial Processes*", by S. Sousa, E. Nunes and I. Lopes, proposes a methodology to minimize operational/technical risk across different processes or departments, minimizing the possibility of spending excessive resources in a given process while other processes pose bigger risks to the organisation or considered system.

Then, M. F. J. R. Monteiro *et al.*, in the paper "*Implementing Lean Office: A successful case in public sector*", present an application of lean approaches in office areas that led to performance improvements and other benefits similarly as in traditional manufacturing environments. The authors report a successful case of lean office implementation in a public sector organization giving emphasis to its major performance improvements.

Next, the paper "*An insertion heuristic for the capacitated vehicle routing problem with loading constraints and mixed linehauls and backhauls*", by T. Pinto *et al.*, presents an approach to the capacitated vehicle routing problem with mixed linehauls and backhauls, based (the approach) on an extended insertion heuristic considering the explicit consideration of loading constraints.

Then, we have the paper "*Condition based maintenance optimization for multi-state wind power generation systems under periodic inspection*", by H. Abdollahzadeh *et al.*, which addresses virtually the most recent approach to maintenance, i.e. to the condition-based, or predictive, maintenance. The paper presents a model for constructing an optimal condition based maintenance model for a multi-state wind farm under the condition that individual components or subsystems can be monitored in periodic inspection.

The next paper "*Shopping centres maintenance management performance: a case study*", by J. Moreira, M. Pereira Lopes and P. Ávila, addresses also maintenance but now the maintenance management in shopping centres. Although shopping centres are different from traditional production workshops, the shopping centres could be considered as a kind of service production systems, and, therefore, approaches applied to the traditional production systems can be

applied to the services production system too. In this paper a methodology to measure the performance of shopping centres maintenance management is presented.

The next group of three papers refers to the Production System Design.

A. Vieira *et al.*, in the paper “*Using Simio to automatically create 3d warehouses and compare different storage strategies*”, present a tool that is capable to generate different types of warehouses that, in the subsequent phase, are used to model different storage strategies and compare them through simulations, focusing on warehouse costs reduction.

The following paper “*Production systems redesign in a lean context: a matter of sustainability*”, the authors A. C. Alves *et al.*, presents a number of case studies on the redesign of production systems within the context of Lean Production that resulted in improved productivity and flexibility as well as a reduction on the shop floor Lean’ wastes.

Next, A. Arrais-Castro *et al.*, in the paper “*Spatial-temporal business partnership selection in uncertain environments*”, discuss a spatial-temporal decision approach capable of handling lack of confidence and imprecision on current and/or forecast data in business’ partner selection, which is one of the sub-processes in designing extended production systems, i.e. the production systems as the network.

Then, the following two papers address the area of enterprise management, which is an area on, conditionally, higher level than traditional production management.

In this area we have the paper “*Business sustainability through employees involvement: a case study*”, by S. Vicente *et al.*, that presents research on the problem of employee’s involvement and collaboration, which is one of the most uncontrollable factors in enterprise, and production systems, organization and management. The authors show how some simple ideas could connect and involve employees and supervisors in a continuous improvement journey in an inbound logistics area of an automotive sector company.

In the same area we have also the paper “*Influence of firms’ environmental management and community involvement programs in their employees and in the*

community”, by L. Fonseca and R. Ferro, which presents an assessment of the influence of firms’ environmental management programs and community involvement programs on their own employees and in the community, with a focus on small and medium companies.

The last area addressed in this Special Issue is the area of, we could say, fundamental research in Industrial Engineering.

In the paper “*Coordination of Systems through Numeraires*”, by P. Garrido, a new paradigm of coordination theory is presented. The paradigm for coordination of systems proposed is based on a controller with enough power to induce coordination among systems with respect to some goal. The power considered here is of organization dissolution or system deletion, conditional on the values of an exchangeable scalar criterion applied to the system by the controller. The criterion is called a numeraire because the paradigm was abstracted from economic systems based on money.

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Guest Editor

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