ABSTRACTS

Examination of manufacturing procedures in TestBed 4.0
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Keywords: process analysis, TestBed 4.0, competitiveness.
Abstract: This article delves into the systematic examination of production processes within the context of TestBed 4.0. The study bifurcates these processes into distinct categories, namely pre-production procedures and core production processes, encompassing essential sub-steps crucial for ensuring the seamless execution of customer orders. The analysis sheds light on how TestBed 4.0, with its integration of Industry 4.0 elements, contributes to heightened efficiency and innovation in manufacturing. By exploring the interconnectedness of production equipment and digital models, the study highlights the potential for creating intelligent and automated industrial enterprises. The findings underscore the role of TestBed 4.0 in responding to market dynamics and fostering competitiveness for industrial enterprises, particularly within the European market.

Plackett-Burman design
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Keywords: Plackett-Burman Designs (P-B Plans), experimental design, factorial experiments, Main Effects Analysis.

Abstract: This article focuses on Placket t-Burman designs (P-B plans) for experiments, which represent an efficient tool for experimental designs, especially in investigating the influence of a large number of factors. Unlike traditional designs such as full factorial experiments (FFE) and fractional factorial experiments (FrFE), P-B plans allow for the effective processing of experiments with a higher number of factors without the need for an exponential increase in the number of trials. Although P-B plans do not directly enable the analysis of interactions between factors, they are ideal for exploring and analyzing the main effects of factors. The article examines in detail the advantages and disadvantages of P-B plans, including their ability to provide experimental error estimates and their efficiency in screening studies. The orthogonality and balance of P-B plans are emphasized, and their application in practice is illustrated with an example of a manufacturing process influenced by multiple factors. The approach based on P-B plans is shown to be a significant contribution to the field of experimental design, especially in situations where it is necessary to efficiently evaluate the impact of a large number of factors with a limited number of trials.