



وزارة التعليم العالي والبحث العلمي

جامعة الموصل

كلية الإدارة والاقتصاد

إمكانية تبني النظم الذكية وأثرها في الأداء المُستدام: اختبار الدور
الوسيط للتصنيع بالاستجابة السريعة/ دراسة استطلاعية في
الشركة العامة للصناعات الكهربائية والإلكترونية

أطروحة دكتوراه فلسفة في

الإدارة الصناعية/ الإنتاج والعمليات

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المُستخلص

افتترضت هذه الدراسة أن التطورات في الأنظمة الذكية يمكن أن تسهم في تحسين الأداء المستدام، وتساعد في جعل العمليات الصناعية أكثر استدامة. في الآونة الأخيرة، ازداد الاهتمام بالاستدامة البيئية، مع التركيز على أبعادها البيئية والاقتصادية والاجتماعية، والتي تعد حاسمة لتعزيز الأداء المستدام في المنظمات الصناعية. وعليه، صيغ السؤال البحثي الرئيسي على النحو التالي: "كيف تؤثر الأنظمة الذكية في تحقيق الأداء المستدام، مع اعتبار التصنيع سريع الاستجابة متغيراً وسيطاً، في الشركة قيد الدراسة؟"

هدفت الدراسة إلى تقييم مدى توفر متغيرات الدراسة (الأنظمة الذكية، والتصنيع سريع الاستجابة، والأداء المستدام) وفهم وضعها الراهن داخل الشركة قيد الدراسة. وقد شمل ذلك شرح طبيعة العلاقات بين هذه المتغيرات من خلال تحليل ترابطاتها واستطلاع آراء العاملين في الشركة العامة للصناعات الكهربائية والإلكترونية.

ولتحقيق هذا الهدف، استُخدم الاستبيان كأداة رئيسية لجمع البيانات. وورّع على العاملين في الشركة العامة للصناعات الكهربائية والإلكترونية، مما أسفر عن استرجاع 235 إجابة. وُحُلّت هذه الإجابات باستخدام برنامج AMOS 26، وهو برنامج مناسب لتحليل علاقات متعددة في آن واحد.

وتوصلت الدراسة إلى عدة استنتاجات علمية، من بينها توفر أبعاد الأداء المستدام داخل الشركة. ومن الجدير بالذكر، أن بُعد الأداء الاجتماعي وُجد أكثر بروزاً من بُعدي الأداء البيئي والاقتصادي.

وتؤكد التوصيات الرئيسية المنبثقة عن الدراسة أن تبني الأنظمة الذكية والتصنيع سريع الاستجابة له تأثير إيجابي قوي على الأداء المستدام. ويشير ذلك إلى أن التركيز على هذه المتغيرات يمكن أن يزيد بشكل كبير من فعالية الأداء المستدام داخل الشركة قيد الدراسة. وفي نهاية المطاف، يهدف الأداء المستدام إلى تقليل الفاقد واستهلاك الطاقة وضمان بيئة عمل آمنة، مما يعزز أبعاده البيئية والاقتصادية والاجتماعية المترابطة.

المُصطلحات الرئيسية: تبني النظم الذكية، الأداء المستدام، التصنيع بالاستجابة السريعة.

Abstract

This study hypothesized that advances in intelligent systems could contribute to improved sustainable performance and help make industrial operations more sustainable. Recently, there has been increased interest in environmental sustainability, focusing on its environmental, economic, and social dimensions, which are crucial for enhancing sustainable performance in industrial organizations. Therefore, the central research question was formulated as: "How do intelligent systems affect the achievement of sustainable performance, with rapid response manufacturing acting as an intervening variable, in the company under study?"

The study aimed to assess the presence of the study variables (intelligent systems, rapid response manufacturing, and sustainable performance) and to understand their current status within the company under study. This involved explaining the nature of the relationships between these variables by analyzing their interconnections and surveying the opinions of employees at the General Company for Electrical and Electronic Industries.

To achieve this objective, a questionnaire was used as the primary data collection tool. It was distributed to employees at the General Company for Electrical and Electronic Industries, resulting in 235 retrieved responses. These responses were analyzed using AMOS 26 software, a program suitable for simultaneously analyzing multiple relationships.

The study reached several scientific conclusions, including evidence of sustainable performance dimensions within the company. Notably, the social performance dimension was found to be more prominent than the environmental and economic performance dimensions.

Key recommendations arising from the study emphasize that the adoption of intelligent systems and rapid response manufacturing has a strong positive impact on sustainable performance. This indicates that focusing on these variables can significantly increase the effectiveness of sustainable performance within the company under study. Ultimately, sustainable performance aims to reduce waste and energy consumption and ensure a safe workplace, thereby promoting its interconnected environmental, economic, and social dimensions.

Keywords: Adoption of intelligent systems, sustainable performance, quick response manufacturing.

The Effect of ABS Polymer on Asphalt Mixtures Properties Containing Blowdown Waste as Sustainable Filler

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HIGHLIGHTS	GRAPHICAL ABSTRACT
<ul style="list-style-type: none"> Performance tests of unmodified and ABS-modified CaCO_3-DG mixtures were evaluated. 1.5% ABS modified-CaCO_3 mixtures show higher resistance to rutting and moisture damage with lower cracking and fatigue resistance when compared with B-mixture containing 1%ABS. B-mixture is a cost-effective solution and eco-friendly than CaCO_3 mixture for pavement application. 	
<p>Keywords:</p> <p>Blowdown</p> <p>Carbon-sulfur</p> <p>Acrylonitrile-butadiene-styrene</p> <p>Rutting resistance</p> <p>Cracking resistance</p> <p>Moisture damage</p> <p>Fatigue resistance</p>	<p>ABSTRACT</p> <p>Recently, Blowdown (B), a carbon-sulfur by-product material of sulfur purification, has been utilized as a potential calcium carbonate (CaCO_3) mineral filler replacement. This study evaluated the effects of acrylonitrile-butadiene-styrene (ABS) polymer on dense-graded (DG) mixtures containing two types of filler (CaCO_3 and B-waste as alternative fillers). Different ratios of ABS (0.5, 1.0, 1.5, and 2.0% by weight of asphalt) were blended with 40/50 paving-grade asphalt. Unmodified and ABS-modified asphalt binders were subjected to physical and homogeneity tests. Blowdown-DG combinations with unmodified and ABS-modified asphalt binders were constructed for the study, and they were tested against the CaCO_3-DG reference mixtures. The concentration was set at 4%, 5%, and 6% (by weight of aggregate) for the blowdown-DG unmodified mixture and was set at 5% for the modified mixture; as for CaCO_3, it was set at 5% (by weight of aggregate) for both the unmodified and modified CaCO_3-DG mixtures. The performance tests, including Marshall stability (MS), Marshall quotient (MQ), indirect tensile strength (ITS), tensile strength ratio (TSR), cracking tolerance index (CT_{index}), deformation strength (S_D) in the Kim test, and semi-circular bending (SCB), were carried out on unmodified and ABS-modified DG mixtures containing both fillers (B and CaCO_3). Also, CT_{index} was calculated from load-displacement curve data of indirect tensile strength. According to the testing results analyzed by Minitab software using analysis of variance least significant difference (ANOVA LSD), unmodified 5% B-mixture exhibited improved performance by different parameters, though it showed higher MS and S_D by values of 15.04 kN, 5.31 MPa, respectively, with lower TSR and CT_{index} than unmodified CaCO_3 mixture by values of 0.80, 35.20, respectively, while 1.5% ABS modified-CaCO_3 mixtures showed higher resistance to rutting and moisture damage by 30.35%, 5.37%, respectively with lower cracking and fatigue resistance when compared with B-mixture containing 1%ABS. Regarding SCB parameters, the results showed noticeable enhancement for ABS-modified mixtures containing both fillers. Furthermore, these results indicated that modified B-mixture needs less dosage (1%) of ABS than modified CaCO_3 mixture which needs (1.5%), meaning that B-mixture is a cost-effective solution and eco-friendly than CaCO_3 mixture for pavement application.</p> <p>2024 M.Sc. Thesis @Univ. of Mosul, College of Eng., Civ. Eng. Dept. (https://www.uomosul.edu.iq/).</p>

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**Possibility of Adoption Smart Systems and its
impact on sustainable performance: Testing the
mediating role of Quick Response
Manufacturing/ exploratory study at the
General Company for Electrical and Electronic
Industries**

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