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## ABSTRACTS

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### **A review on the positive implications of augmented reality pick-by-vision in warehouse management systems**

(pages 1-10)

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**Keywords:** augmented reality, order picking, pick-by-vision, warehouse management system.

**Abstract:** Augmented reality (AR) is a significant Fourth Industrial Revolution (IR4.0) technology that employs computer-generated display, sound, text, and effects to enhance the user's real-world experience via wearable devices. Order picking processes have had a substantial influence on overall operational efficiency in warehouse management systems (WMS). The conventional picking process is challenging to handle, which may result in deviations from the intended picking performance. Pick-by-vision, a new technological solution for order picking, is receiving growing attention and is now considered a significant WMS-supporting technology. This article explores the positive implications and prospects of utilizing AR pick-by-vision technology in the warehouse picking processes by performing a narrative review of the previous review articles. To demonstrate the focus of the main area, this study also presents the hierarchical classification structure of AR implementation in WMS and highlights the pick-by-vision method. The analysis provided important key findings by evaluating 23 articles (original articles and case studies) on AR pick-by-vision technology applications, which are significant to the prospective advantages of AR pick-by-vision deployment in warehouse operations. This study gathers knowledge and insight that can be used by both academics and professionals who are interested in optimizing this new advanced technology for future research.

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### **Assessing the major sources of uncertainty in supply chains: survey**

(pages 11-23)

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**Keywords:** supply chain management, uncertainty, forecasting, information sharing, supply chain.

**Abstract:** Reducing uncertainty in the supply chain (SC) is probably one of the major difficulties that the company must solve. Indeed, the SC is currently under enormous pressure and the decision-making process is frequently confronted with varied settings while making decisions due to the degree of uncertainty. The purpose of this study is to investigate the main major sources of uncertainty in SC. The study also examines the practices adopted to reduce uncertainty and enhance

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forecasting accuracy. A survey was carried out. Questionnaires were distributed amongst the managerial staff located in Morocco and other countries. We collected work e-mail addresses of managerial staff managerial working in SCs that operate in mass production and also in large-scale distribution and invited them to participate in an anonymous online survey. The questionnaire was designed to assess respondents' views about the main sources of uncertainty in SC and how they do to reduce it. Findings indicate that uncertainty occurs in any SC process, but the main uncertain processes are procurement, supply planning, and demand forecasting. In addition, uncertainty comes from external and internal factors. Moreover, the decision-making mode, SC partnership, and risk contract have an important impact on the occurrence of uncertainty in the SC.

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## **The role of information and digital tools in supply chain management during the Covid crisis**

(pages 25-34)

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**Keywords:** small and medium-sized businesses, local market, digitalization, standardization, supply chain manageability.

**Abstract:** Supply chains have become the most vulnerable during the COVID-19 pandemic, as evidenced by problems in the supply of semiconductors, food, and other products, which raises the problem of supply chain manageability. There has been a so-called 'shortening' of the supply chain. The paper addressed the problem of using digital tools in small and medium-sized enterprises (SMEs). The study aims to examine the main digital tools used by local businesses and evaluate the prospects for logistics management using new technology. The hypothesis is that SMEs that do not use digital tools in supply chain management are also characterized by the poor quality of management. A survey was conducted to identify the actual supply chain management practices during the COVID-19-induced crisis in the Russian Federation, the Republic of Azerbaijan, and the Republic of Kazakhstan and discover common trends and differences in these countries. A set of recommendations for implementing best global practices in these countries was suggested. The study found that poor supply chain management correlates with a lack of digital tools application. The studied enterprises were divided into five groups based on the digital tools level and provided tailored recommendations to improve the integration of such tools.

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## **To stay or not to stay: the mediation roles of job satisfaction and organization commitment among women in logistics industry**

(pages 35-46)

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**Keywords:** extrinsic, intrinsic, organization commitment, self determination theory, smart PLS.

**Abstract:** The logistics sector is considered non-traditional for women as the industry employs mostly men as the required tasks are considered masculine. Logistics operation runs 24/7, which leads to long working hours and overlaps with women's household responsibilities. The situation is linked to turnover intention among women in this industry. Numerous studies have acknowledged women to be as good as men. Therefore, turnover among women in this industry is a significant loss for the industry as gender imbalance remains a major issue. Furthermore, studies on this subject remain scarce. This study addressed the literature gap by adopting the Self Determination Theory (SDT) and investigated the factors influencing female employees' intention to stay in the logistics industry. Data analysis was performed using a purposive sampling technique and Smart Partial Least Squares (Smart PLS). Resultantly, job satisfaction mediated the relationship between intrinsic motivation and intention to stay but did not mediate extrinsic motivation and intention to stay. Additionally, the relationship between work-life balance and intention to stay was mediated by organisational commitment. The findings benefit human resource management in the logistics industry to design a better policy to reduce retention prevalence and decrease the number of talented female employees leaving this industry.

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## **Adaptation of logistics companies to operation under the Covid-19 pandemic restrictions** (pages 47-60)

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**Keywords:** adaptation, pandemic, logistics company, digitalization, electronic logistics.

**Abstract:** The COVID-19 pandemic has made the problem of companies adapting to operate under restrictions more acute. Logistics companies were the special focus of researchers because of the specifics of the COVID-19 pandemic.

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The article aims to determine the features of the management of logistics companies to adapt them against the background of the COVID-19 pandemic restrictions. The methodological background of the analysis is the analysis of financial ratios — Total Revenue Growth; Capital Expenditure Growth; Working Capital Growth; Debt/ Equity ratio; Equity/Total Assets, as well as the case method — a description of the business situation of the company in the sample of JD Logistics, which have successfully adapted to changes against the background of the COVID-19 pandemic. Analysis of the financial statements of the surveyed companies revealed several trends in their financial management during the pandemic — a decline in net income from sales after the pandemic; an increase of capital investments in 2019-2021; reduction of working capital growth rates after 2019; growth of the debt-to-equity ratio after the beginning of the pandemic; maintaining the equity to assets ratio at a stable level in 2019-2021. A set of factors influencing the exogenous and endogenous environment is identified in support of the logistics companies adaptation programme under the COVID-19 pandemic restrictions by the following blocks: “government action and regulatory policy”; “support of the company’s operation”; “company finance”; “customer relations”; “relations with suppliers”. Prospects for further research involve studying financial and market factors influencing the practice of adaptation of logistics companies in a pandemic, as well as studying the problem of adaptation of companies in the post-crisis phase after the COVID-19 pandemic.

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## **The management of construction projects in Iraq and the most important reasons for the delay**

(pages 61-70)

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**Keywords:** delaying construction, delaying project time, management, logistics, projects.

**Abstract:** In Iraq, there is a vast construction movement. Still, it is accompanied by many problems, the most important of which is the delay in completing projects during the specified time. The time must be optimized by adopting the leadership practice and dedicating it to the benefit of performing the process and functions of the project. The research aims to identify the most important reasons and factors that affect the project delivery process within the specified period. The investigation initially dealt with the most important previous studies, on this subject, by researchers, then touched on the concept of construction projects, their types and details. A questionnaire containing reasons for the delay was identified and divided into several items. It concluded that the most common reasons for delays are delays in laboratory testing of materials, assignment of works to the lowest bidder, contractors' financial incompetence, and high building materials prices. The most crucial factor is to streamline building material inspection procedures, set up inspection laboratories on several occasions and assess the contractor's effectiveness and ability to implement before the project is referred financially. Organizations and individuals should coordinate their work between the construction departments to prevent any issues that may arise during completing tasks.

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## **Waste analysis of tapioca unloading process with lean supply chain approach in Makassar Port**

(pages 71-77)

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**Keywords:** lean supply chain, value stream mapping, waste, fishbone diagram.

**Abstract:** In the process of dismantling tapioca flour, waste occurs due to activities that do not provide added value (Non-Value Added). The purpose of this study is to identify and analyze the types of waste and then propose improvements to eliminate activities that do not provide added value. By using the concept of lean supply chain and value stream mapping (VSM) it is expected to eliminate activities that do not provide added value and make the company more productive. Through the analysis of seven wastes and fishbone diagrams, it is known that the biggest causes of waste are waiting for the arrival of workers, waiting for pilot/tug boats, waiting for trucks to arrive, and working on sacks that have fallen and torn. Meanwhile, the recommendations given are to coordinate and evaluate the performance of workers, increase the number of pilot/tug boats and trucks, and supervise the unloading process to minimize mistakes made by workers. With the proposed improvement, the cycle time, which was originally 335.34 minutes decreased to 271.97 minutes, and for Process Cycle Efficiency (PCE) which was originally 68.30% increased to 84.22%.

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## **Assessing carbon emissions reduction by incorporating automated monitoring system during transit: a case study**

(pages 79-88)

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**Keywords:** container logistics, carbon footprint, automated monitoring, emission control, travel time.

**Abstract:** The green concept in operations is becoming an inevitable part of global maritime logistics activities and has an important influence on the improvement of efficiency and environmental performance. This paper aims to assess the continuous monitoring and tracking of container shipments at the ports in order to reduce carbon emissions thus improving environmental performance. In this research, near real-time RFID data tracing and tracking container cargo are shared by the automated monitoring system. The collected data gathered via digitalization is further analyzed to ensure a greener maritime logistics system. The significant findings of the study for the literature show that the actual fuel consumption is reduced when automated monitoring systems are used at the ports (Ports and CFS (Container freight station)). The reduced fuel consumption during the transit between the ports and CFS has resulted in a reduction in carbon emissions of environmental performance. The results show a 6 % reduction in emissions from port to CFS and 23% from CFS to ports. Thus, effective practices in Green Logistics are considered to be beneficial for carbon emissions. These findings contribute to the understanding and development of effective strategies for logistic operations using technologies to create a green performance. The study was performed in a certain set of environmental dimensions and the results may vary depending on the organization, which can be studied further in future research.

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## **The usage of RFID robots in logistics process management**

(pages 89-93)

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**Keywords:** RFID robot, internet of things, logistics.

**Abstract:** The aim of this post is to point out the use of RFID robots in the management of logistics processes. RFID technology is defined first. RFID technology represents identification using radio frequency waves. The principle is to store the necessary data in radio frequency memory chips and then repeatedly read or write the data using a reader. We divide RFID chips into active and passive. Active RFID chips use energy from a battery, while passive RFID chips are a technology without an internal power source. Passive RFID is the most common form of RFID in warehouses, using which inventory is taken using RFID robots or hand-held RFID readers. Nowadays, many RFID robots from different manufacturers are available on the market. When choosing, I must consider where we want to use the RFID robot and choose the one that suits us based on its specific characteristics. The RFID robot is a mobile and autonomous RFID system that performs an inventory of the given space based on our initial setup. The RFID robot locates each item in 2 dimensions (x and y). Most robots can move in all directions because they can rotate without shifting. The accuracy of the inventory using the RFID robot ranges from 95-99%, while the accuracy of the inventory performed by employees using handheld RFID readers ranges from 85-95%. As for speed, it is on average 10 times faster compared to manual RFID readers.

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**Optimizing internal transport in terms of technical parameters in a mining company**

(pages 95-103)

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**Keywords:** transport, machines, costs, reliability, innovations.

**Abstract:** The research scientific article summarizes the arguments within the scientific discussion on the issue of internal transport and machine park in mining companies. The machine park in mining companies is base of effective mining processes and optimal results of mining. The machine park in the mining company introduces a combination of stagnant and active equipment in the process of mining. The goal of this article is to reflect the innovative approach in the creation of internal transport by machine park in the mining company with the aim of increasing the reliability, safety, failures, and efficiency of mining equipment. The entity of the investigation was the selected mining company in Slovakia focused on limestone mining. Approach of research were focused on using comparative analysis of the technical parameters of mining machines and their technical performance. The relevance of the decision of this scientific research was connected with the innovation of a mining machine park focused on mobile machines with a combination of stationary machines.

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The article presents the results pointing to significant improvements in the machine park of the mining company. In this paper we suggest two alternatives (two models that monitor the factors as quality, costs, safety, reliability, and optimization of company resources, which are important for the optimal arrangement of equipments) of the composition of the machine park for a selected mining company with Mobil crusher Sandvik QJ341+, Mobile sorter McCloskey S130, Wheel loader CAT 972 M, and tracked excavator CAT 336F and second alternative Mobil crusher Hartl 12/65J, Mobile sorter Anaconda SR514, Wheel loader CAT 966 M and tracked excavator CAT 329E. The results of two alternatives of the machine park in a mining company can be recommendations for other mining companies in the area of building the machine park for mining processes and its optimization.

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## **Impact of industrial free zones on the business environment of emerging countries**

(pages 105-110)

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**Keywords:** free economic industry, emerging countries, international trade, industrial development, logistics.

**Abstract:** Free economic zones are one of the many ways for governments to alleviate a national crisis situation, by helping increase trade, enhance production, and create provisions of foreign direct investment. That can help in improving the economic condition of the country and enhance the quality of life of the country's population. Free economic zones, or free zones, in Morocco have also been established for similar reasons, and due to its perfect geographical location, has become one of the top priority destinations for regions across the globe for logistic purposes. To meet this objective, the reflection carried out at the level of this study turned towards the development of free zones in connection with the business environment in emerging countries, taking into consideration the case of Morocco, then it has a very strong logistical evolution as well as an exceptional geographical position for the improvement of its positioning in international competitiveness. This article presents the results of a quantitative study on the business environment of free zones in Morocco as well as on their economic impact aimed at improving the country's logistics level. This study aims to understand the theoretical and practical purpose of establishment of free zones in Morocco, their significance in the logistics industry, and their key advantages and challenges. This study provides a research background for industry practitioners and academicians of different regions alike to understand the use of Moroccan free zones to effectively strategize logistics decisions from a corporate standpoint, leading to better economic performance.

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## **The features of negotiations within reverse logistics cooperation**

(pages 111-119)

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**Keywords:** reverse logistics, cooperation, value, negotiations, dimensions of negotiations.

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**Abstract:** The subject of consideration in the paper are negotiations between companies cooperating within reverse logistics. The objective of the paper is to present a concept for describing the specificity of such negotiations, influencing the ability of cooperating parties to create and recover value within reverse logistics. As introductory part of the article the methodology used for preparation of article is presented. Then, reverse logistics as the activity influencing value creation and value restoration is characterized. In next part of the work main units cooperating and negotiating within reverse logistics are distinguished. In this part the specificity of reverse logistics as environment for negotiations is also presented. Within the subsequent parts of the article in order to present the features of negotiations within reverse logistics cooperation the original methodological framework is applied, comprising the key aspects of negotiation's definition, distinguished on the basis of different approaches presented in literature, e.g. as a process, methods of conflict management and reaching agreement, mutual dependence of the parties and processes of: decision making, communication, mutual exchange and value creation. The summary synthesizes the major features of the considered negotiations, and also indicates the directions of research enriching the proposed concept. The approach to description of negotiations presented by the authors of the paper is a novelty and has an original character, i.e. it is based on their own thoughts on the specificity of the negotiations under consideration. No such concept has been presented in the literature on the subject so far.

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## **Design and control order picking route of a retailer warehouse using simulation to increase labour productivity**

(pages 121-133)

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**Keywords:** order picking control, routing, warehouse management.

**Abstract:** The aim of this study is to find out the optimal path for the manual picking process used by warehouse operators to enhance the productivity of the manual picking system in the retail warehouse in Jordan using simulation Software. WMS Software was used to determine the different picking methods and the distance travelled in each path of the order-picking process to discover the optimal layout design for the warehouse. Several time studies were conducted using the stopwatch to determine the average picking time for each operator using those paths that were suggested by the simulation program to choose the same arrangement. Then, the average throughput was calculated for each operator for each routing method. The results showed that there is a strong correlation and relationship between the routing method and operator productivity. Further, it is found that productivity is higher by 29% when the operator chooses the optimal path shown by the simulation program, and this improvement in order picking will lead to a high level of service satisfaction and a lower level of operational cost for storage. Improving picking methods and optimizing picking paths can increase the total number of orders an operator can fulfil in a single working day, resulting in increased operator utilization.

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## **Austrian future cubicle: commuting, e-commuting or both?**

(pages 135-140)

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**Keywords:** commuting, e-commuting, transport, work models, work flexibility.

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**Abstract:** Austria tries to reach its decarbonisation targets by 2050. The significant attention lies in the carbon intensity of transport, with commuting of particular interest. The paper presents E-Commuting practices that are suitable tools to intervene in these journeys; however, it seems to be difficult. Exploring and understanding the commuting system of everyday lives is crucial. It is through this understanding that alternative avenues for intervention arise, for example into the practice of flexible working models. To understand the influence of e-commuting, the questionnaire via WhatsApp of 685 respondents was conducted, which considered an understanding of work and the commute necessary. The aim of the paper was to explore the workers' routines for in-office days and work-from-home days. The results show that the employees want to work remotely full or in hybrid mode and this trend is going forward. The employees are more productive with flexibility mode – 73.08%; they wish more flexibility in terms of returning to the cubicle – 71.79%; they desire the same amount of time of flexibility and going into the cubicle – 70.51%. Finally, in the case of any flexibility in their current organization, they would consider looking for another job that did not require return to the cubicle with the same salary – 53.85%.

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## **Assisting artificial intelligence adoption drivers in human resources management: a mediation model**

(pages 141-150)

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**Keywords:** artificial intelligence, human resources management, banking sector, artificial intelligence adoption drivers.

**Abstract:** This study investigates the artificial intelligence (AI) adoption drivers and the mediating effects of trust and how the latter influence human resources management (HRM) of the banking sector in Saudi Arabia. A survey-based questionnaire was employed to collect data from 261 practitioners and professionals working in different banks in Saudi Arabia. Partial least squares structural equation modelling (PLS-SEM) was used to analyze data. Significant and positive effects of perceived usefulness and trust on artificial intelligence adoption in human resource management are highlighted by the results. In addition, the indirect effects of trust between perceived usefulness and AI adoption in human resource management were also found to be significant.

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