
ABSTRACTS

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**TRANSFORMATION THE LOGISTICS TO DIGITAL LOGISTICS:
THEORETICAL APPROACH**

(pages 217-223)

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Keywords: digitalization, decoupling point, supply chain, Kanban, MRP

Abstract: In connection with Industry 4.0, professional publications are mostly focused on the introduction of new technologies, research of new and intelligent materials, etc. which mean evolution compared to the present. However, it is also necessary to focus on the implementation of the product within the supplier-customer relationship, as the customer's impact on the final product is significant. The article deals with the transformation of the Supply Chain using the DDMRP methodology, which aims to maintain best practices, address their shortcomings, and integrate pull-based replenishment tactics. It is a comprehensive tool that integrates the entire Supply Chain, including the integration of customers and suppliers.

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**THE COMPARISON OF TRANSPORT INFRASTRUCTURES IN
INDIVIDUAL SLOVAK REGIONS BY APPLYING PCA AND CLUSTER
ANALYSIS**

(pages 225-234)

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Keywords: transport infrastructure, regions, comparison, PCA, cluster analysis

Abstract: The development of the transport segment is currently an essential process which affects several other industries. The transport infrastructure and the services provided in this sector influence economic growth, the efforts aimed at increasing competitiveness, as well as prosperity of the society. One of the key problems Slovakia is facing is the long-term growth of differences between individual regions. The present article deals with the evaluation and comparison of selected transport infrastructure indicators in eight regions of Slovakia. The evaluation was carried out by applying basic statistical methods and multiple-criteria statistical methods. Every region was characterised by 20 selected variables describing its uniqueness (e.g. population, area, GDP per capita, road infrastructure etc.). The evaluation of similarities between individual regions in terms of selected variables was carried out by applying the Principal Component Analysis (PCA) and Hierarchical Cluster Analysis. Within the PCA, the original input variables were replaced with three principal components describing as much as 86.68% of the cumulative variance. The average linkage method, as one of the hierarchical methods, was applied to create a dendrogram representing the similarities between the regions of Slovakia. The cophenetic correlation coefficient value of $CC=0.936$ confirmed the proper selection of the average linkage method. The output of the cluster analysis was that 8 regions of Slovakia were divided into five similar homogenous clusters based on the examined variables. The final analysis indicated that the transport infrastructure and the development thereof significantly affect the differences between individual regions of Slovakia and, as a matter of fact, they belong to the factors creating such differences.

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INTEGRATED APPROACH IN ORGANIZING LOGISTIC ACTIVITY (pages 235-243)

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Keywords: logistics operators, integrated approach, efficiency, profit

Abstract: The main theoretical aspects of the features of the formation of the logistics activities of organizations in the modern conditions of the transformation of the world market are considered. The conceptual necessity of using an integration approach in organizing logistics activities, taking into account the influence of factors of the macroeconomic environment, has been substantiated. The main aspects and features of intrafirm and interfirm logistic integration of organizations are interpreted and reasoned, which, in contrast to existing approaches, makes it possible to distinguish this process from its influence on the main activity, taking into account the risk factors. The conceptual factors contributing

to the formation of integration processes in the organization in modern conditions of the transformation of the world market are highlighted. It is argued that the modern realities of doing business, regardless of the type of economic activity, necessitate the use of an integrated approach in management when organizing logistics activities. With the help of economic and statistical analysis of the logistics services market in the world, the intensity and need for the use of intrafirm logistics integration are substantiated. The developed theoretical and methodological approach of the integration organization of logistics activities can be applied in practice, taking into account the peculiarities of the economic activities of organizations in modern conditions.

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THE IMPACT OF THE COVID-19 PANDEMIC ON SUPPLY CHAIN PERFORMANCE OF THE AUTO PARTS INDUSTRIES OF THAILAND

(pages 245-251)

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Keywords: the COVID-19 pandemic, supply chain performance, automotive parts industries, Thailand

Abstract: This research aims to analyse the impact of the COVID-19 Pandemic on Supply Chain Performance of the Auto Parts Industries of Thailand. The primary data collected from an online questionnaire sent to 400 samples obtained by a stratified sampling method selected from tier 1, tier 2, and tier 3 auto parts manufacturers. The structural equation model applied for analysis. The results showed that the COVID-19 Pandemic, Environment performance, Negative performance, and operation performance affected supply chain performance. For suggestions from this research, first of all, the company's knowledge of internal management. And government involvement has a direct impact on the performance of the auto parts supply chain. The government's participation as factors of external influence also has an immediate effect on supply chain management. Company practices show that governments have played an essential role in promoting the auto parts industry's survival since its upstream. Midstream and downstream pressure has an indirect effect on corporate and consumer of supply chain management practices.

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INFLUENCE OF TWO DIFFERENT ACCURACY IMPROVEMENTS TO NUMERICAL PRICE FORECASTING

(pages 253-260)

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Keywords: price forecasting, numerical modelling, exponential approximation, commodity exchange

Abstract: The paper aims to compare two different strategies of accuracy improvement of studied prognostic numerical models. The price prognoses of aluminium on the London Metal Exchange were determined as the numerical solution of the Cauchy initial problem for the 1st order ordinary differential equation. To make the numerical model more accurate two ideas were realized, the modification of the initial condition value by the nearest stock exchange (initial condition drift) and different way of creation of the differential equation in solved Cauchy initial problem (using two known initial values). With regard to the accuracy of the determined numerical models, the model using two known initial values obtained slightly better forecasting results. The mean absolute percentage error of all observed forecasting terms was mostly less than 5%. This strategy was more successful in problematic price movements, especially at steep price increase and within significant changes in the price movements. Larger fluctuation of prognoses calculated by this model was disadvantageous in forecasting terms with a small error. Moderate increase of prognoses obtained by the model using initial condition drift better described price fluctuation. Both chosen strategies eliminated the forecasting terms with the mean absolute percentage error larger than 10%. Therefore, we recommend both strategies as acceptable way for commodity price forecasting.

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DESIGN OF WASTE VEGETABLE OIL COLLECTION NETWORKS APPLYING VEHICLE ROUTING PROBLEM AND SIMULTANEOUS PICKUP AND DELIVERY

(pages 261-268)

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Keywords: Vehicle Routing Problem Simultaneous Pickup and Delivery - VRPSPD, waste vegetable oil, recovery logistics

Abstract: The growth of industrialization in Mexico has caused an increase in the demand for materials to satisfy the consumption of goods and services of a growing population. Given this scenario, there is a rise of the residual generation with affectations on the ecosystem and population health. Hence, the objective of this research was to design a network for waste vegetable oil collection based on vehicle routing problem with simultaneous pickup and delivery, starting from a distribution centre to 49 restaurants, as the generation sources of waste vegetable oil. The Vehicle Routing Problem Simultaneous Pickup and Delivery with Time Windows was the variant used as a vehicle routing method to solve the problem. The free software VPRPD was the tool used to solve the vehicle routing problem with simultaneous pickup and delivery that allowed to specify time restrictions. This software uses the simulated annealing metaheuristics in its syntax. As a result, it was obtained a total of 8 networks, for a vehicle capacity utilization of 70 percent in the 6 t vehicle and 46 percent in the 8 t vehicle.

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THE APPLICATION OF SMED METHOD IN THE INDUSTRIAL ENTERPRISE

(pages 269-281)

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Keywords: waste, lean production, changeover, SMED method

Abstract: The production process fluency is often interrupted by idle time. A significant proportion of individual idle times is caused by changeover. Trends, such as the individualization of requirements, the constant effort to meet the customers' requirements on time and the maintaining of the production process fluency at low costs, are aimed at eliminating idle time. In terms of contradictory goals such as individualization of customer requirements, which is reflected in the high variability of production / products and minimalization of the production time and its fluency, it is necessary to pay increased attention to the changeover process. The problem related to the changeover process can be solved in two ways: by reducing the number of changeovers (reducing production variability and achieving dissatisfaction with individual customer requirements) or by shortening the changeover time (while maintaining production variability and ability to satisfy a wide range of individual customer requirements). The Single-Minute Exchange of Die - SMED method is used to shorten the time duration of the changeover process and eliminate waste in the given process. The aim of the paper is to apply the SMED method in vibration welder changeover process in a selected industrial enterprise and thus achieve a shortening of the changeover process. The SMED method was applied in the enterprise which belongs to the group of small and medium-sized enterprises. The research method was indirect observation via video recording and time snap. Various types of waste were identified based on the analysis, and subsequently eliminated by proposed rationalization measures. Finally, the time duration of the changeover process before the analysis and after the implementation of rationalization measures was compared.

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LEANING OF PROCESSES AND IMPROVING THE WORKING CONDITIONS OF THE NEWLY CREATED WORKING ZONE

(pages 283-290)

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Keywords: working conditions, working zone, layout, efficiency, lean

Abstract: The aim of the article is to propose ways to increase the functioning efficiency of the newly created workplace with regard to the course of the processes themselves, as well as of the working conditions of the affected employees in the selected company, dealing with the production of refrigeration and air conditioning units for automobiles. The automotive market is primarily customer-oriented, to which companies strive to meet and deliver high-quality products that are different from their competition. To ensure this goal, it is necessary to acquire theoretical knowledge in the field of organization and structure of the production process. It is also necessary to analyse problematic points of the newly created working zone on the basis of observations and interviews with employees. The essence of streamlining the workplace and improving the working conditions of employees lies in the identification, analysis and elimination of shortcomings, that have arisen mainly due to dynamic changes and rapid implementation of the working zone in the corner of the production hall. Based on the identified deficiencies, the authors of the paper have proposed corrective actions and have analysed the results of the improved condition.

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INNOVATIVE APPROACHES TO ASSESSING ORGANIZATIONAL CHANGES AT AUTOMOTIVE INDUSTRY ENTERPRISES: THE EU EXPERIENCE FOR UKRAINE

(pages 291-299)

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Keywords: organizational changes, innovations, corporate management, automotive industry

Abstract: The article considers the features of organizational changes (organizational innovations) that have been carried out in the automotive industry of countries that have relatively recently joined the European Union (the Czech Republic, Slovakia, Poland, and Romania). These countries, starting from 1990s and throughout 2000s, rebuilt their own automotive industry and managed to attract investors, which resulted in increased production and car exports. The article substantiates that in the modern world the automotive industry has tendencies towards internationalization (production in different countries), development of large multi-brand concerns (production of different classes and makes of cars), cooperation (OEM companies and car dealers cooperating with concerns), and specialization (each country produces cars that meet market needs, either for domestic consumption or for export). This issue is extremely important for Ukraine, as the Ukrainian automobile industry now ranks second among the post-Soviet countries and 11th among the Eurozone countries in terms of production, with 7 automobile plants operating in Ukraine. The purpose of the article is to analyse organizational changes in the automotive industry enterprises in Eastern Europe, including the introduction of innovations, as well as to determine the possibility of implementing such changes in the automotive industry in Ukraine.

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IMPACT OF E-COMMERCE ON THE PERFORMANCE OF AGROEXPORTS IN THE CENTRAL REGION OF PERU (pages 301-307)

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Keywords: e-commerce, export performance, distribution efficiency, communication efficiency

Abstract: The objective of the research was to determine the impact of electronic commerce on the performance of agro-exports in the central region of Peru, 2020. The study was carried out from a quantitative approach with a non-experimental - cross-sectional - causally correlated research design. Using the survey technique, two questionnaires were applied to 95 agro-exporters, one for electronic commerce and the other for export performance. Using the structural equations model, it was obtained that electronic commerce in its compatibility dimension does not have a positive impact on the efficiency of the distribution of companies ($p > 0.05$) and does have a positive impact on the efficiency of communication ($p < 0.05$). Regarding ease of use, it does not have a positive impact on the efficiency of the distribution ($p > 0.05$); however, it does have a positive impact on the efficiency of communication ($p < 0.05$). Regarding the perceived utility it has a positive impact on the efficiency of distribution ($p < 0.05$), but it does not have a positive impact on the efficiency of communication. It is concluded that the compatibility and ease of use of electronic commerce positively impact the performance of communication efficiency in agro-exports and the perceived utility has a positive impact on the performance of the efficiency of distribution in agro-exports of the companies of the central region of Peru.
