
ABSTRACTS

*doi:10.22306/al.v6i4.129**Received: 18 July 2019**Accepted: 15 Aug. 2019***EVALUATING THE IMPACT OF ORDER PICKING STRATEGIES ON THE ORDER FULFILMENT TIME: A SIMULATION STUDY**

(pages 103-114)

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Keywords: customer service level, discrete event simulation, order fulfilment, picking policies**Abstract:** A Distribution Centre (DC) is considered a critical node in providing optimal customer service levels in a supply chain network. Therefore, improving order fulfilment time at DCs becomes critical to achieve world-class operations. One of the key processes involved in order fulfilment is that of picking, the activity that consumes most time when fulfilling an order. This article presents the analysis of an actual system that stores products in a random fashion and releases orders following FIFO rules. A simulation model is built, and two scenarios analysed. The first one (baseline) reflects the current DC operation. The second scenario (projected) includes the implementation of three picking strategies aimed at improving system performance: slotting, wave picking, and expedite picking (balancing picker's workload). The following KPIs are used to compare both scenarios: order fulfilment lead-time, picks per man-hour, average picking time per order, average time to pack an order. Simulation results show that the systematic implementation of the proposed strategies achieves substantial improvements, not only in the order fulfilment time (54% reduction), but also in the number of orders completed in less than 8 hours, the number of orders picked per man hour and a reduction of pickers idle time.

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THE DEVELOPMENT OF THE INNOVATION STATUS AND IMPACT OF SMART PACKAGING ON SLOVAK CONSUMERS

(pages 115-122)

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Keywords: innovation, smart packaging, Kano model

Abstract: The decision about packaging belongs to the most substantial product characteristics. It has impact on the quality of food as well as shopping preferences of consumers. Because the significance of packaging keeps increasing, companies need to take a more innovative approach to packaging policy in the context of ecological innovations. The food packaging industry is largely subject to change from passive to innovative packaging resulting in making the smart packaging. The producing companies, processors of food, logistic operators as well as consumers constantly ask for more innovative packaging (smart packaging) to make products that fulfil standards in the area of quality, safety or identification of products within the logistic chain. The research of understanding and attitudes towards smart packaging as well as evaluation of its utility and requirements was used by the Kano model concept. The aim of the paper is to determine the development of innovation status and the impact of smart packaging on consumers in different age categories in Slovakia. The results show the positive impact of smart packaging on Slovak customers. Innovation status of smart packaging among Slovak customers in determined age categories has increased during the monitored period and younger respondents evaluate the smart packaging as an added value of the product. This added value of smart packaging supports the smart logistics to make the whole logistic chain more effective to develop a decentralized database storing the constantly increasing number of various records, such as product movement or its quality.

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INFLUENCE OF THE PRICE MOVEMENTS TO THE ACCURACY WITHIN NUMERICAL PRICE FORECASTING

(pages 123-130)

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Keywords: price forecasting, numerical modelling, exponential approximation

Abstract: The paper is aimed at commodity price forecasting using a numerical solution of the Cauchy initial problem for the 1st order ordinary differential equation. To acquire significant forecasting improvement, the idea of the modification of the initial condition value was realized. By having analysed the forecasting success of determined numerical models, it was found out that commodity price evolution affected the accuracy of the price forecasting. The absolute percentage prognoses errors were usually lower at a stable price increase and when price fluctuation appeared. Therefore, prognoses calculated without changing initial condition value were satisfying. Within significant changes in the price evolution and at a rapid price increase, the prognoses acquired higher absolute percentage errors. That caused replacing the initial condition value by the nearest stock exchange. Consider this strategy, the following calculated prognoses got closer to the forecast stock exchanges and price forecasting became more advantageous with respect to the price course.

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**TECHNOLOGY DEVELOPMENT PROCESS AND MANAGING
UNCERTAINTIES WITH SUSTAINABLE COMPETITIVE ADVANTAGE
APPROACH**
(pages 131-140)

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Keywords: Sustainable Competitive Advantage (SCA), SCA risk level, knowledge and technology effect, manufacture strategy index, product and process development cycle

Abstract: The main purpose of this research work is to assist the decision-making process which is related to technology and knowledge factor within an organization. The data has been gathered and analysed from a particular multinational company that operates in the ceramic manufacturing industry within Malaysia. Four respondents were sought to answer the sense-and-respond questionnaire, including the part on technology sharing. The priority among technology types, including basic, core, and spearhead was decided by the maximum coefficient of the variance. The work has two main contributions: 1. It proposes and validates a tool for decisions and strategies related to technology focus in firms, and 2. expands the notion of technology types from focusing only on product development to one that focuses on both product and process development. The results of the study show that the proposed model which was previously applied in high tech start-ups and local medium-size enterprises is applicable in large industries involved in mass production.

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USE OF DIGITAL TOOLS IN LOGISTIC AND PRODUCTION FACILITY MANAGEMENT FOR EFFECTIVE INFORMATION FLOW

(pages 141-146)

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Keywords: data, data collection, digital forms, information flow, paperless

Abstract: The article deals with the use of digital forms in the manufacturing environment to reduce the amount of printed paper and streamline the flow of information of production and logistic processes. The aim of this article is to point out the possibility of using simple and commonly available solutions to collect the necessary data. The problem is the need for higher computer skills of ordinary users. It can be used in both logistics and production environments. In a medium-sized company, the amount of paper printed using a printer may be approximately 19000 pcs per year, which consider checklists, forms, diaries of processes or maintenance. This quantity amounts to approximately 1140 EUR. The article focuses on the tools, which are commonly available software to smaller and larger companies in the manufacturing industry, and of course in other industries.

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CONCEPTUAL DEVELOPMENT OF ELECTROMOBILITY IN CONDITIONS OF SLOVAK MUNICIPALITIES

(pages 147-154)

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Keywords: local action plan (LAP), electromobility, charging infrastructure, battery electric vehicles (BEV), plug-in hybrid electric vehicle (PHEV)

Abstract: Development of electromobility depends on several factors. Framework conditions are usually defined at the national level, typically by government, but sometimes the national conditions are also affected by the European framework. The national framework has been developed in Slovakia in recent years in the form of a package of strategic documents that are successively practically realised. The problem is that the framework does not have an adequate response at regional and local levels. The development of electromobility in the conditions of the municipalities will have a relevant impact mainly on the infrastructure. Therefore, the municipalities would be prepared for the development of electromobility. Generally, it should be a document typically covering the medium-time period that defines measures of the municipality and is interconnected with other relevant municipality documents. The paper analyses the benefits and barriers of electromobility and typical car user behaviour generally and specifically in electromobility environment. Then the typical aspects regarding the development of Local action plan for electromobility are presented. Thereafter the process of the plan development and experiences gained during the plan development are described. Finally, the particular measures of Local action plan of e-mobility for Municipality of Senec are stated.

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FORECASTING DEMAND IMPROVEMENT FOR REPLENISHMENT IN A RETAIL PAINTING COMPANY

(pages 155-164)

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Keywords: forecast, MAPE, service level, economic order quantity, inventory management

Abstract: This case study was developed in a retail painting company; the main objective is to reach a higher cash flow for assuring the fulfilment of the demand with a 95% service level. Currently, supply chain faces to multiples competitors so familiar business have to improve the logistics processes for remaining in local, national and international markets. Through the ABC-classification, the product portfolio was classified for choosing the products with more significative impact. Forecasts techniques may obtain data with higher accuracy in the order preparation. For this research, a seasonal model is functional, since the demand tends to have a similar behaviour year by year and month by month. Seasonal demand model was used to find specific products that might not fit for ordering minimum quantities which might exceed the forecasted demand. On the other hand, classic EOQ model considers the value of the inventory and demand forecast, which demonstrates that the performance of the supply chain could improve considerably. Therefore, an accurate estimate can reduce inventory costs in each of the periods, satisfying customer demand, by at least 14%. EOQ model should apply to all products for reducing the investment in slow-moving stock and improving the inventory for those highly demanded products which can generate flexibility to embrace market complexity and meet customer expectations. As a future study, the company can develop a strategy to reduce non-rotating inventory with more accurately, what and when they will sell specific products.

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SUSTAINABLE MULTIMODAL AND COMBINED TRANSPORT IN THE EUROPEAN UNION

(pages 165-170)

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Keywords: logistics, transportation, multimodal, railway, EU

Abstract: The manuscript deals with the problematic of multimodal and combined transport in the European Union. Multimodal transport is an intermodal transport where most of the road in Europe is carried out by rail, inland waterway or maritime transport and each start and end of the road that is made by road is as short as possible. Road traffic is used only on short routes, e.g. for the carriage of goods to rail or sea or to pick up the goods at the place of unloading. The aim of this manuscript is to point out of the European Commission priority, that is to reducing CO₂ emissions, congestion and air pollution to improve the quality of life of European citizens. Our research is focused on state of the art of multimodal and combined transport with which it can be reduces CO₂ emissions and energy consumption per cost unit and future directions of multimodality.

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NEW TECHNOLOGIES FOR SUSTAINING DEVELOPMENT IN INFRASTRUCTURE, LOGISTICS AND CONSTRUCTION INDUSTRY

(pages 171-177)

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Keywords: sustainability, infrastructure, construction industry, green roof, ecological footprint

Abstract: Infrastructure, transport and the construction industry belong to a potentially significant polluted environment. However, the current development of technologies and materials in the construction industry gives the possibility to eliminate the negative effects of transport and construction. Designing and building green buildings can significantly improve the environment and reduce the environmental footprint of transport, logistics and construction. This research discusses the issue and possibilities of new progressive technologies implemented in the construction industry for the needs of sustainable infrastructure, logistics and construction. The paper details the possibilities of green roofs, their advantages and impact not only on the construction industry, but also on infrastructure and transport in general. The aim of the paper is to specify these technologies and possibilities from the theoretical point of view.

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IRON PRODUCTION LOGISTIC ASPECTS

(pages 179-186)

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Keywords: iron, ore, transport, logistics, expenses

Abstract: Pig iron production is a technologically and organizationally demanding process. A blast furnace plant consists of a great number of support processes that are necessary for the continuous operation of the given blast furnace. The iron production process involves a huge volume of input raw and other materials and manufactured products. Various transportation types are used for the given material transport. The logistic demands of individual processes often differ based on a given blast furnace plant. The conducted research included an analysis of the logistic demands of individual parts of a blast furnace plant. The possibility of utilizing various transportation types and individual application options of the selected instruments has also been assessed. The research took place under the conditions of a selected iron manufacturer in the Czech Republic. This article analyses the key aspects of the conducted research. The research was carried out in 2018-2019. The data were processed for the logistics and production part.
