



Fig. 4. "smart tag"

B) Mobil section includes:

- Device on a railway vehicle. This provides information on the position of the train on the railroad infrastructure and sends it through the server to the road vehicle.



Fig. 5. Device on a railway vehicle (Manufacturer MSVe Studenka)

C) Device on the road vehicle.



Fig. 6. Device in the road vehicle

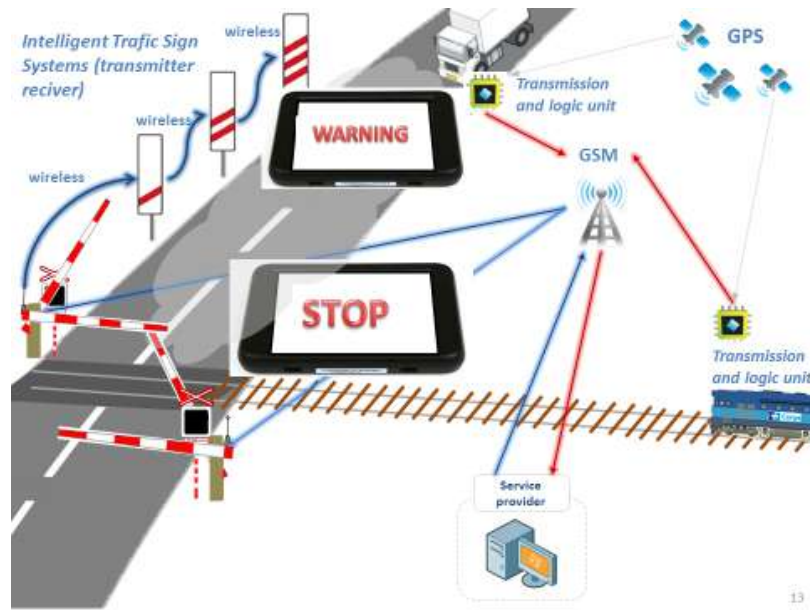
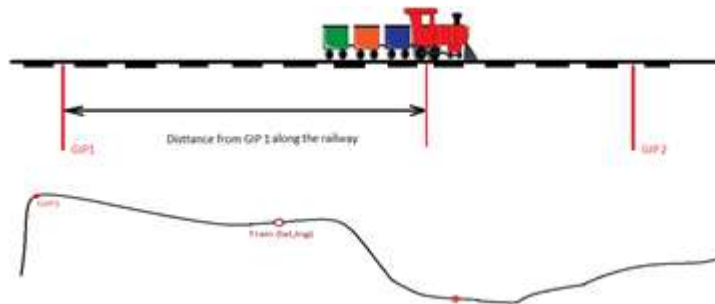


Fig. 7. Functional diagram of the system

2. Train model – theoretical location

- The train is moving along the railway from its initial position (GIP)
- And we periodically getting the updates which contains information about train odometer (distance traveled from the last detected GIP, current speed and acceleration)
- Easy to predict a next state of model from equations



$$\dot{x}_{t+1} = \dot{x}_t + \frac{a_t * \Delta t}{m}$$

$$x_{t+1} = x_t + \dot{x}_t * \Delta t + \frac{a_t * \Delta t^2}{2m}$$

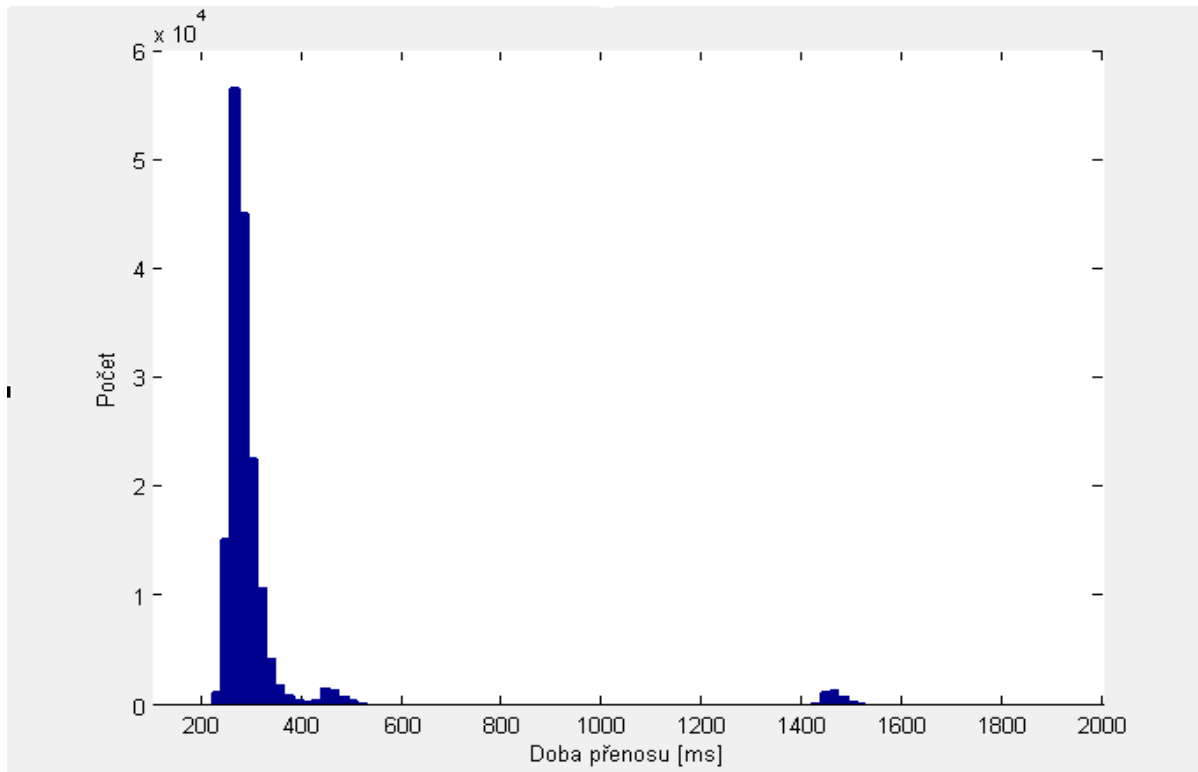


Fig. 8. Statistics of data transfer between railway vehicle and road vehicle

3. Results

RESULTING VALUES:

- Provider 02 Czech Republic a.s.
- Lost data: 0.75%
- Modus transmission time: 325 ms
- **Pilot verification system was built on the railway line Šumperk – Kouty nad Desnou.**

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ABSTRACTS OF THE LOGI CONFERENCE PAPERS

Creating Visual Work Instructions to Ensure Safe and Fluent Operation of the Semi-automatic Production Lines

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Abstract: The process of robotics in the world, but also in Slovakia is constantly increasing, and although new types of robots are being developed, the human hand of those work stations cannot be removed completely. Despite already developed and functioning collaborative robots that allow safe operations side by side with humans, it is necessary for a worker to know accurate, fast and safe procedure of his working activities. Visual work instructions (VWI) are made for this purpose. The worker must be able to quickly understand the principle of work procedure and get quick information about potential risks in very short time. Therefore, great regard for the content of VWI must be taken. At first glance, a simple visual work instructions enable not only to increase safety at the workplace, but also increase workers productivity.

Keywords: Standard work instruction, picture-based work instruction, developing flowchart for standard work instruction, types of work instructions, decision making in work instruction creation.

Possibilities of Using Transport Terminals in South Bohemian Region

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Abstract: Currently, when there is a need for transport services adapted to the customer requirements and create a workable operational system, there is increasing talk about transport terminals. Since the South Bohemian region is one of those where this issue will be increasingly dealt with, this paper suggests ways to use transport terminals as important support systems for freight and passenger traffic.

Keywords: Transport terminals, passenger transport, integrated transport system, public transport.

Determinants of Distribution Logistics in the Construction Industry

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Abstract: Global business is currently still influenced by the economic crisis and the economic development in each country of the EU. The construction sector is among the most affected sectors of the national economies. The production of building material is a part of the construction industry. Several companies of this sector in the European Union use business logistics effectively. The overall efficiency of the company is influenced by many various external and internal determinants, especially the distribution logistics.

The basic determinants of distribution logistics may be classified by the demographic, economic, technical and political background. The article deals with selected determinants in distribution logistics companies producing building materials. Based on the analysis and conclusions of the analysis it is possible to determine the effect of specific determinants for the further development of business logistics of these companies and the whole industry.

Keywords: Determinant, distribution logistics, construction industry.

Modeling the Supply Process Using the Application of Selected Methods of the Operational Analysis

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Abstract: Supply process is one of the most important enterprise activities. All raw materials, intermediate products and products, which are moved within enterprise, are the subject of the inventory management and by their effective management can be achieved the significant improvement of enterprise position on the market. From that reason, the inventory needs to be managed, monitored, evaluated and affected. The paper deals with the utilizing the methods of the operational analysis in the field of inventory management in terms of achieving the economic efficiency and ensuring the particular customer's service level as well.

Keywords: Inventory theory, stochastic models, static models, stationary models, fixed order quantity, fixed order period.

Supplying of Assembly Lines Using Train of Trucks

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Abstract: Efficiency of production systems depends on correct settings of the logistic flows and on suitably chosen method of material supply. The typical supply system conceptions, i.e. the concepts “Just-in-time” (JIT) and “Just-in-sequence” (JIS) are very important factors with regard to a fluent operation of the assembly lines. Therefore the contemporary intra plant transport systems are being replaced by a new kind of the transportation technology, namely by means of the trains of trucks. The trains of trucks are used in two possible operational modes: either with a driver or without driver (fully automated). The logistic trains, which are driven personally – by the drivers or are operating in automatic regime, offer a lot of advantages in the area of intra plant logistics, predominately. The train of trucks enables to transport an increased amount of the material or components required for the final assembly using a reduced number of the individual runs in comparison with the fork-lift trucks and this process can be performed without the driver. The trucks of the logistic trains are also cheaper and they are able to carry a larger volume and mass of the material at once. There are reduced in this way not only the investment costs, but also the operational expenses.

Keywords: Supplying, logistic flow, fluency of production, assembly lines, train of trucks.

Proposal of the Roundabout Solution within the Particular Traffic Operation

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Abstract: This paper presents the practical solution of the transport telematics elements within the particular traffic operation when providing the transport and logistics services. Roundabout helps to increase the fluency and safety of the transport and logistics services in the city and urban areas, however, the positive effect can be achieved only after determining the proper intersection parameters. Based on the survey performed in the real traffic situation, the practical application of roundabout in the city of Pilsen is processed in the most important part of the paper.

Keywords: Transport, logistics, telematics, roundabout, traffic operation, traffic lights device.

Logistics Response to the Industry 4.0: the Physical Internet

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Abstract: Today's mankind and all human activities are constantly changing and evolving in response to change in technology, social and economic environments and climate. Those changes drive a "new" way of manufacturing industry. That novelty could be described as the organization of production processes based on technology and devices autonomously communicating with each other along the value chain. Decision-makers have to address this novelty (usually named as Industry 4.0) and have try to develop appropriate information systems, physical facilities, and different kind of technologies capable of meeting the future needs of economy. As a consequence, there is a need for new paradigms of the way freight is move, store, realize, and supply through the world (logistics system). One of the proposed solutions is the Physical Internet, concept of open global logistics system which completely redefines current supply chain configuration, business models, and value-creation patterns. However, further detailed research on this topic is much needed. This paper aims to provide a balanced review of the variety of views considered among professionals in the field of Physical Internet with the final aim to identify the biggest challenges (technological, societal, business paradigm) of proposed new logistics paradigm as a practical solution in supporting Industry 4.0.

Keywords: Logistics efficiency, digitalization, logistics transformation, internet of things.

The Use of Simulation Models in Solving the Problems of Merging two Plants of the Company

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Abstract: Paper focuses on utilization of analysis of different possibilities of merging two production sites with the help of simulation model of company processes. Software SIMUL8 was chosen as a development environment for its possibility of dynamic discrete simulation of company processes. In the first phase, it analyses current status of both production sites. It is followed by suggesting several possible solutions for their potential merger. Each solution is analyzed with the help of simulation models. They has been evaluated and the optimal solution was selected.

Keywords: Simulation models, merging of two production plants, manufacturing logistics.

Applying the Heuristic to the Risk Assessment within the Automotive Industry Supply Chain

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Abstract: Risk management facilitates risk identification, evaluation, control, and by means of appropriate set of measures, risk reduction or complete elimination. Therefore, the risk management becomes a strategic factor for a company's success. Properly implemented risk management system does not represent a tool to avoid the risk; it is used to understand the risk and provide the bases for strategic decision-making.

The risk management represents a key factor for the supply chain operations. Managing the risks is crucial for achieving the customer satisfaction and thus also a company's success. The subject-matter of the article is the assessment of the supply chain the automobile industry, in terms of risks. The topicality of this problem solution is even higher, as after the economic crisis it is necessary to reevaluate the readiness of the supply chain for prospective risk conditions. The article's benefit consists in the use of the Saaty method as a tool for the risk management within the supply chain.

Keywords: Risk, supply chain, automotive industry, Saaty method.

Logistics of Trainsets Creation with the Use of Simulation Models

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Abstract: This paper focuses on rail transport in solving the train formation operational processes using the computer simulations. The problem has been solved in program SIMUL8 and applied to specific train formation station in the Czech Republic. The paper describes a proposal simulation model of the train formation work, experimental modeling with an assessment of achievements and design solution for optimizing of the train formation operational process.

Keywords: Simulation models, Simul8, logistics problems, rail transports, train formation operational processes.

Using a Software Tool in Forecasting: a Case Study of Sales Forecasting Taking into Account Data Uncertainty

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Abstract: Forecasting is one of the logistics activities and a sales forecast is the starting point for the elaboration of business plans. Forecast accuracy affects the business outcomes and ultimately may significantly affect the economic stability of the company. The accuracy of the prediction depends on the suitability of the use of forecasting methods, experience, quality of input data, time period and other factors. The input data are usually not deterministic but they are often of random nature. They are affected by uncertainties of the market environment, and many other factors. Taking into account the input data uncertainty, the forecast error can be reduced. This article deals with the use of the software tool for incorporating data uncertainty into forecasting. There are presented own proposals of forecasting approach and simulation of the impact of uncertain input parameters to the target forecasted value by this case study model. The statistical analysis and risk analysis of the forecast results is carried out including sensitivity analysis and variables impact analysis.

Keywords: Forecasting, ARIMA, multiple linear regression, Monte Carlo simulation.

Comparison of the Temperature Conditions in the Transport of Perishable Foodstuff

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Abstract: In this article will be compare temperatures in transport different types of perishable foodstuffs. Comparison will be made on base on the evaluation of measurement data remote probe and compared with the temperature measured thermograph installed in the vehicle. The results will be compared with a tolerance listed in the individual regulations, laws and Agreement ATP, which are further described in the first part of the article.

Keywords: Agreement ATP, probe, thermograph, measurement, banana, eggs.

The Analysis of Orders Perishable Goods in Relation to the Bullwhip Effect in the Logistic Supply Chain of Food Industry: a Case Study

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Abstract: The bullwhip effect generally refers to the phenomenon where order variability increases as the orders move upstream in the supply chain. It is serious problem for every members of the supply chain. This effect begins at customers and passes through the chain to producers, which are on the end of the logistic chain. This issue is necessary to reflect especially in the food supply chains. These chains are unique for problems of expiration of goods (particularly perishable goods), variable demand, orders with quantity discounts and effort to maximize the customer satisfaction.

This paper will present the problem of the bullwhip effect in the real supply chain in the food industry. This supply chain consists of approximately 350 stores, four central warehouses and more than 1 000 suppliers, but the case study will examine 87 stores, one central warehouse and one supplier in 2015. The aim of this paper is the analysis of the order variability between the various links in this chain and confirmation of the bullwhip effect in this chain. The subject of the analysis will be perishable goods.

Keywords: Bullwhip effect, perishable goods, logistic chain, order, supply chain, food industry, customer satisfaction.

Comparison of Particular Logistic Models Adoption in the Czech Republic

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Abstract: Managing inventory is considered as one of the most challenging tasks facing supply chain managers and specialists. Decisions related to inventory locations, level of inventory kept throughout the supply chain have a fundamental impact on the response time, service level, delivery lead-time and the total cost of the supply chain. The main objective of this paper is to find out and analyze the share of particular logistic models adopted in the Czech Republic (Consignment stock, Buffer stock, Safety stock) and compare their usage and adoption according to different sizes of companies and industries. This paper also aims to specify possible reasons of particular logistic models` preferences in comparison to the others. The analysis is based on quantitative survey held in the Czech Republic.

Keywords: Consignment Stock Concept. Buffer Stock concept. Safety stock concept. Supply Chain. Inventory Policy. Vendor Managed Inventory.

Management of Customer Service in Terms of LIS

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Abstract: This paper focus on competition advantages based on customer services, namely the logistic services. Customers consider their purchases in its complexity and all the logistic services should be designed to match to customers' preferences as much as possible. That is why, we made the survey of Internet shoppers. Our aim was to identify and evaluate of customers perceiving in frame of sales proposals offered by e-shops. Collected data were processed with the usage of cluster analysis. The aim of this paper is to present the results and conclusions from this research with focus on the elements of logistics services within e-commerce. These outputs can be used for knowledge base of information systems through which companies evaluate their decisions and selection of variants. For the enterprise, it is important to appropriate decisions about resource allocation and design of the structure of logistics services were set based on real customer preferences. This article demonstrates a way to improve customer service and the potential to achieve competitive advantage.

Keywords: E-commerce, preference of customers, logistics, knowledge base, LIS.

E-commerce and its Impact on Logistics Requirements

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Abstract: The contribution will focus on the development of e-commerce. The extent of the development of internet by age category will be assessed and based on correlation analysis will be analyzed developments in the near term. Analysis of logistics operators will be performed in the field courier, express and parcel shipments. Market competitiveness B2C will focus on flexibility in delivery, evening delivery or on weekends, term delivery (increasing the cost of tracking shipments and their records), use and offering banking products with secure payment system, readiness do deliver the goods via its own fueling point. On the contrary, legal provision regulating the entrance to the parking are, entrance into pedestrian zone service may limit or prevent.

Keywords: E-commerce, postal item, postal parcel.

Heuristic Optimization Approach to Selecting a Transport Connection in City Public Transport

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Abstract: The article presents a heuristic optimization approach to select a suitable transport connection in the framework of a city public transport. This methodology was applied on a part of the public transport in Košice. This solution focused on examining the individual transport services and their interconnection in relevant interchange points.

Keywords: Urban shared-passenger transport, transport network, logistics.

Gathering Information from Transport Systems for Processing in Supply Chains

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Abstract: Paper deals with complex system for processing information from means of transport acting as parts of train (rail or road). It focuses on information gathering, information transmission and information usage in information systems of logistic firms for support of selected processes. Different kinds of gathered information from whole transport chain are discussed. Compliance with existing standards is mentioned. Security of information in full life cycle is integral part of presented system.

Keywords: Logistics, RFID, AutoID, traceability, Internet of Things, trainset.

Development of S-ARIMA Model for Forecasting the Demand in the Beverage Supply Chain

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Abstract: Demand forecasting is one of the key activities in planning the freight flows in supply chains, and accordingly it is essential for planning and scheduling of logistic activities within observed supply chain. Accurate demand forecasting models directly influence significant decrease of logistics costs, since they provide assessment of customer demand. Customer demand is a key component for planning all logistic processes in supply chain, and therefore determining levels of customer demand is of great interest for supply chain managers. In this paper we deal with exactly this kind of problem, and we develop the seasonal Autoregressive Integrated Moving Average (S-ARIMA) model for forecasting demand patterns for major product of observed beverage company. Model is easy to understand, flexible to use and appropriate for assisting the expert in decision making process about consumer demand in particular periods.

Keywords: Consumer demand, time series, S-ARIMA.

Simulation of Production Lines Supply within Internal Logistics Systems

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Abstract: Supplying of production lines is a complex logistic process, which is very difficult with regard to the requirements of its operation and scheduling. From this reason this supplying process demands an increased attention. Application of a computer simulation is an efficient tool suitable for solution of the supplying logistic questions. There will be presented in our paper the application possibilities of the software Tecnomatix Plant Simulation specified for simulation of the supplying process by means of the system Milk Run.

Keywords: Simulation, Milk Run, transport, logistics.

Environmental Factors Consideration at the Industrial Transportation Organization in the «Seaport – Dry port» System

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Abstract: Currently, a development of container transportation is directly associated with increase of warehouse areas for containers' storage. One of the most successful types of container terminal is an intermodal terminal called a dry port. Main pollution sources during the organization of intermodal transport are considered. The system of dry port parameters, which are recommended for the evaluation of different scenarios for a seaport infrastructure development at the stage of strategic planning is proposed in this paper. Authors have developed the method of optimal values' determination of main dry port parameters with utilization of simulation modeling in the programming software AnyLogic. The dependencies that were obtained as a result of modeling experiments prove the adequacy of main selected dry port parameters for the effective evaluation of scenarios of throughput and handling capacity at existing seaports at the stage of strategic planning and a rational dry port location, allowed ensuring the improvement of the ecological situation in a port city.

Keywords: Pollution, environmental factor, dry port, hinterland, intermodal transportation, simulation modeling, parameters.

Security in Logistics

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Abstract: This paper deals with security of logistic chains according to incorrect declaration of transported goods, fraudulent transport and forwarding companies and possible threats caused by political influences. The main goal of this paper is to highlight possible logistic costs increase due to these fraudulent threats. An analysis of technological processes will be provided, an increase of these times considering the possible threats which will be evaluated economic costs-wise. In the conclusion, possible threat of companies' efficiency in logistics due to the costs', means of transport and human resources' increase will be pointed out.

Keywords: Safety, Transport process, Risk, Supply Chain, Carrier.

The Use of Computer Simulation Methods to Reach Data for Economic Analysis of Automated Logistic Systems

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Abstract: Automated logistic systems are becoming more widely used within enterprise logistics processes. Their main advantage is that they allow increasing the efficiency and reliability of logistics processes. In terms of evaluating their effectiveness, it is necessary to take into account the economic aspect of the entire process. However, many users ignore and underestimate this area, which is not correct. One of the reasons why the economic aspect is overlooked is the fact that obtaining information for such an analysis is not easy. The aim of this paper is to present the possibilities of computer simulation methods for obtaining data for full-scale economic analysis implementation.

Keywords: AGV, simulation, analysis, economics.

Intelligent Transport Systems in the Management of Road Transportation

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Abstract: Extension of European Union causes increase of free transfer of people and goods. At the same time it is possible to monitor problems with transport, for example congestions, and related accidents on the roads, delays in air traffic, etc. For increase the efficiency and safety of transport, the European Commission supports implementation of intelligent transport systems and services in all fields of transport (ITS – Intelligent transport systems). Implementation of ITS in the road transport reduces accident frequency, increases capacity of existing infrastructure and reduces congestions. Use of toll systems provides resources needed for the construction and operation of new road network, improves public transport, cycling transport and walking transport, and also their multimodal integration with individual automobile transport.

Keywords: Transport, management, traffic flow.

The Methodology of Selection the Transport Mode for Companies on the Slovak Transport Market

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Abstract: Transport volume in the Slovak Republic is growing continuously every year. This rising trend is influenced by the development of car industry and its suppliers. Slovak republic has also a geographic strategy position in middle Europe from the side of transport corridors (east-west and north-south). The development of transport volume in freight transport depends on the transport and business processes between the European Union and China and it is an opportunity for Slovak republic to obtain transit transport flows.

In the Slovak Republic has road transport a dominant position on transport market. The volume of road transport gradually increased during last years. The increase of road transport is reflected on the highways and speed roads in regions which have higher economic potential. The increase of rail transport we can see on the main rail corridors, but is not as significant as in road transport. Trade globalization has an influence on the increase of transport volume also in intermodal transport. Multiple increase based on the prediction of transport volume for this transport mode is from 2,3 mil ton per year at present to 8 mil ton to year 2020.

Selection of transport mode and carrier is the important aspect for logistic management, because companies (customers) want to reduce the number of carriers which they trade and they create the system of several key carriers. Bigger transport volume and more qualitative transport service give a possibility to reduce transport costs. This trend is positive for carriers too, because the carriers can focus only on the selected customers and provide more qualitative services.

The paper is focused on the selection of transport mode based on the proposed methodology. Partial aims of the paper are definition of criterions which directly influence the selection of transport modes, determination level of criterions based on the subjectively methods, creation the process for the selection of transport modes and practical application of proposed methodology.

Keywords: Road transport, rail transport, methodology.

Optimal RFID Readers' Location Method at Industrial Rail Transport for Irregular Railcar Traffic Volume Controlling

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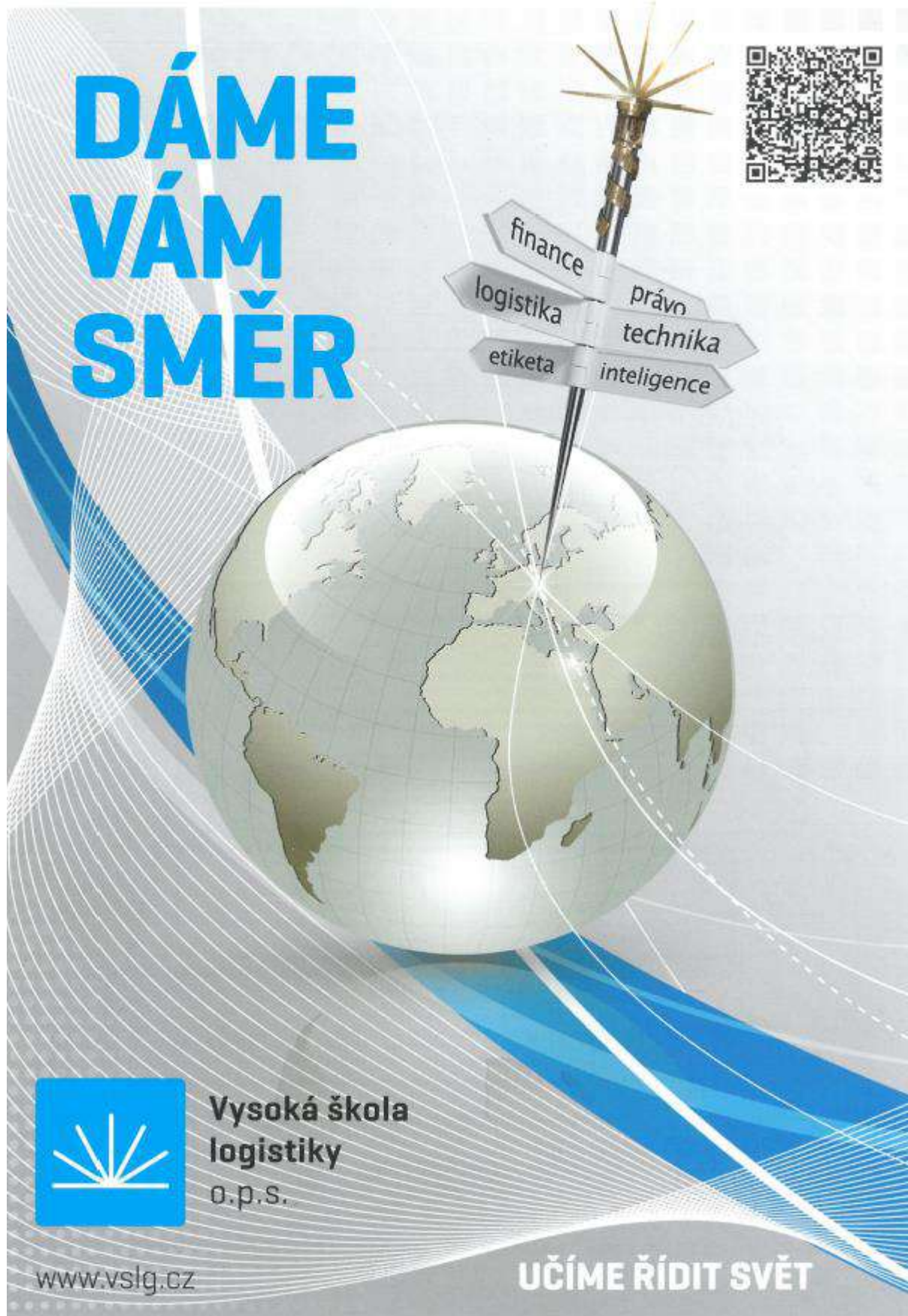
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Abstract: Problem of operational data obtaining about location and railcars movement is relevant in the ever-growing requirements to ensure timely and safe transportation. A technical solution to improve an efficiency of data collection about railway rolling stock is implementation of. Currently, there are several such systems, differing in principle of operation. The most prospective for railway transportation, in the authors' opinion, is the RFID technology, involving to equip railway tracks by stationary points of remote reading (RFID data reader) from the control-board sensors on the railcars. However, regardless of specific type and producer of such systems, their implementation involved with significant financial costs for large industrial rail transport systems, having an extensive network of special railway track utilization with a large number of stations and loading areas. For the investment cost reduction on establishing an identification system for rolling stock on special railway tracks of industrial enterprises, method is developed, based on idea of priority installation RFID data reader at rail hauls, which have uncertain railcar traffic volumes according with structure and capacity, which parameters are difficult or impossible to predict on basis of an existing information data system. To select optimal locations of RFID devices, the mathematical model of a staged installation of such devices has developed, depending on irregularity value of railcar traffic volumes, passing through a certain railway hauls. As a result of this approach implementation, necessity for installation of numerous RFID data readers at all station railway tracks and loading areas of industrial railway stations is eliminated, that allows minimizing total cost for rolling stock identification and method implementation of optimal control for transportation process.


Keywords: RFID, railway transport, railway nodes, industrial rail transport, irregular railcar traffic volume, controlling, mathematical model, linear programming.



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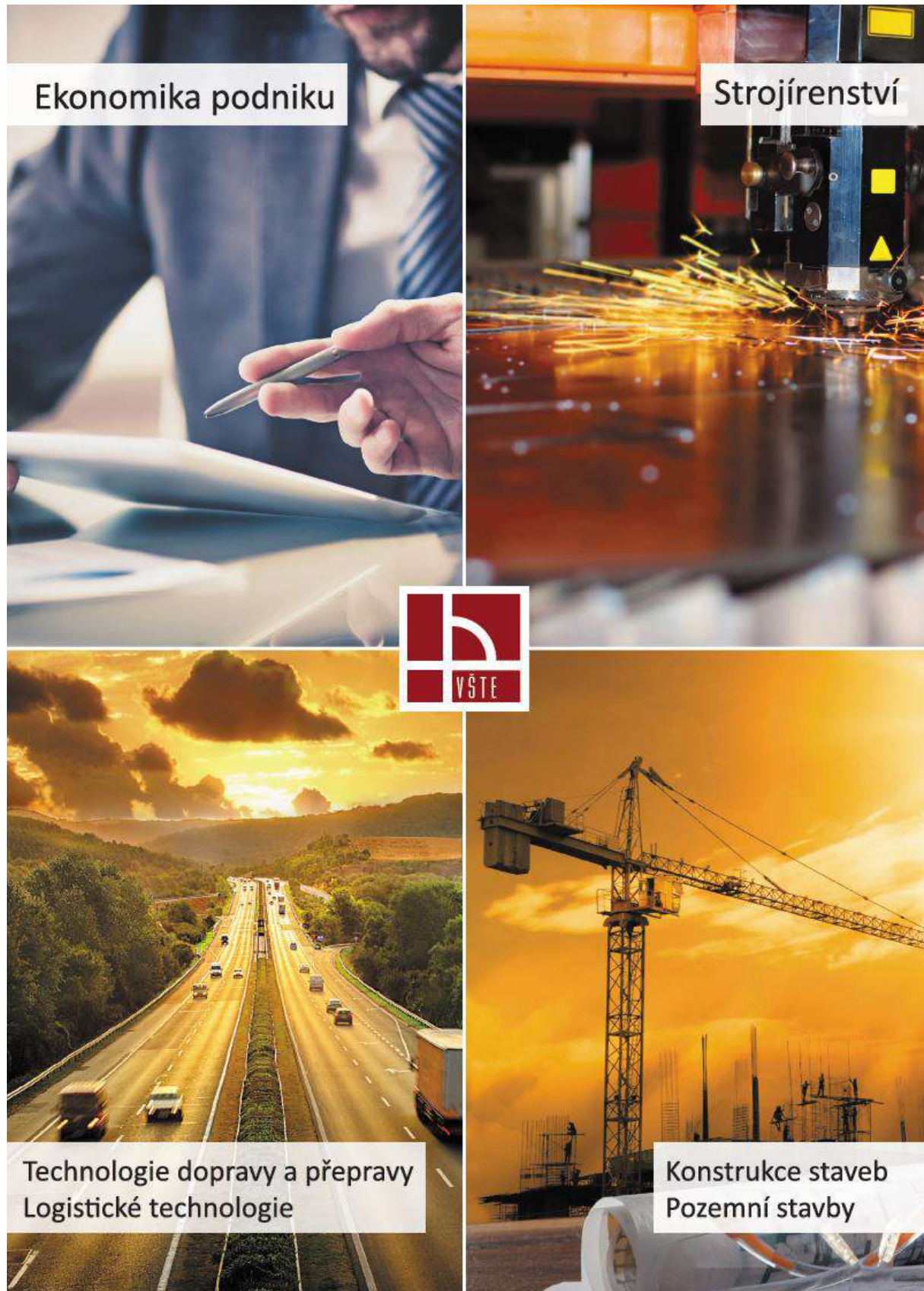
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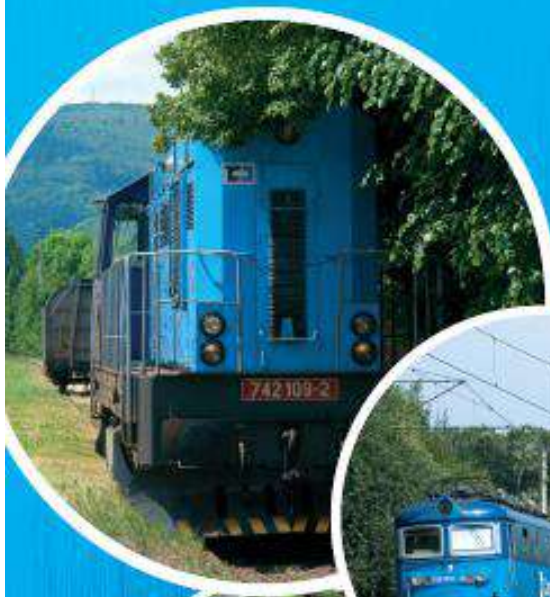
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- 40 autobusových linek, 1085 spojů
- Vozový park: SOR, IVECO
- Přeprava jízdních kol; Bezbariérová doprava
- Příležitostná zájezdová doprava



SERVISNÍ ČINNOSTI

- Autorizovaný servis IVECO, IVECO BUS (KAROSA), SOR
- Všeobec. servis: Výměny olejů, provoz. kapalin, filtrů a mazání
- Prodejní sklad náhradních dílů; Prodej kapaliny AdBlue®
- Myčka osobních vozidel; Zámečnictví; Bosch car servis
- Zajištění STK + měření emisí; Ověřování digitálních tachografů

TQM - holding s.r.o., Těšínská 1028/37, 746 01 Opava

tel.: + 420 553 609 111, www.tqm.cz, e-mail: tqm@tqm.cz

Váš partner pro dopravu, logistiku a opravárenství

ZUBR GRAND DRŽÍ TRUMFY



4× CHMELENÁ 11%

TOPTRANS



Expresní přeprava kusových zásilek

Nakladatelství: Vysoká škola logistiky o.p.s.
Palackého 1381/25
750 02 Přerov I – Město

Tiskárna: JUTTY GROUP s.r.o.
Tovární 3087/7a
750 02 Přerov I – Město

Rok vydání: 2016

Obálka: Michal Sedláček

Sazba: Michal Sedláček

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