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**ABSTRACTS**

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*doi:10.22306/al.v5i1.83**Received: 16 Mar. 2018**Accepted: 26 Mar. 2018***A LOGISTIC APPROACH TO ESTABLISHING BALANCED SCORECARD  
OF RUSSIAN OIL-PRODUCING SERVICE ORGANIZATIONS**

(pages 1-6)

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**Keywords:** balanced scorecard, key performance indicators, logistical principles, oil-producing service organizations, strategy

**Abstract:** The aim of the study is to develop methodological recommendations for balanced scorecard practical implementation into activities of Russian oil-producing service organizations in present-day conditions on the basis of logistical principles. The perspectives for balanced scorecard development based on logistics principles and strategic management peculiarities of the oil-producing service organizations are proposed in the article. The indicators and their characteristic values, allowing to coordinate operational and strategic management and to obtain synergistic effect are suggested. As a result of the study, the authorial methodology of balanced scorecard using for oil-producing service organizations was developed in order to improve effective cooperation between service organizations of vertically integrated oil companies.

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## TRENDS IN AUTOMATIC LOGISTIC SYSTEMS AND LOGISTIC MARKET IN SLOVAKIA

(pages 7-14)

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**Keywords:** logistics, automatic systems, workforce, logistics market

**Abstract:** The paper focuses on innovation in the field of automated logistics systems oriented on increasing the efficiency, safety and performance of industrial enterprises in Slovakia. Majority of new trends in logistics are based on the Industry 4.0 concept, which is focused on increasing the competitiveness of industrial enterprises. The development of the industry in Slovak republic resulted to the increased demand for warehouse space. Dynamic development of the industrial sphere in Slovakia also leads to the increased demand for qualified labour. The authors of the paper analysed new trends in automated logistics systems such as autonomous vehicles, AGV systems and hybrid modules for AHV vehicle. Mentioned facts are also evident by the analysis of logistics warehousing development and the need for the logistics workforce in Slovak republic.

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## **FORMATION OF SUPPORT FOR SMALL ENTERPRISES IN THE PROCESS OF BUSINESS INCUBATION WITH THE APPLICATION OF LOGISTIC CHAINS**

(pages 15-18)

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**Keywords:** support of small enterprises, information and analytic instruments, logistic chains, business incubation

**Abstract:** In this article the content of information and analytic support for small businesses is disclosed, the specifics of using information and analytic instruments such as consulting, training, expert support, event-monitoring are described, and improvement of the provision of information and analytic services through remote and complex rendering of these instruments in the form of online support. The purpose of this article is to develop practical recommendations for improving the support for small business in the business incubation process taking into account the trends in the formation of the information economy. One of the most effective institutions for supporting small business is the formation of a network of business incubators. The problem of absence or the complexity of obtaining information and analytic services due to weak interaction between a small enterprises and a business incubators was investigated. We propose to develop an IT complex, which includes a database of existing business incubators and relevant information and analytic instruments for support small enterprises. This complex is based on the remote interaction of small enterprises and business incubators. Getting a remote information analytic service can be considered as a logistical process of delivering a service to the small enterprise. Remote application of a complex of information and analytic instruments will contribute to the following results: improving the quality of providing infrastructure support; expanding the cooperation of the business incubator with scientific organizations; development of a positive image of the business incubator; improving the interaction of small enterprises and business incubators.

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## **AUTOMATIC WAREHOUSES WITH TRANSPORT ROBOTS OF INCREASED RELIABILITY**

(pages 19-23)

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**Keywords:** warehouses, robots, control, diagnostics

**Abstract:** The algorithm of optimal control of transport robots for automatic warehouses is considered in the paper. The minimum criterion for a quadratic form was chosen as the criterion of optimality. A quadratic functional of quality that determines the energy of control and displacement is considered. A solution is proposed for a quality criterion that minimizes the energy of control and displacement. The robots control based on a mathematical model is proposed with the calculation of the state matrices and the control matrix at each step. The properties of transport robots system are considered: controllability and identifiability. For a linear stationary system, the criteria for controllability, identifiability and observability as the rank of the extended matrix are chosen. It is proposed to perform diagnostics of drives, electronic control devices and software in a complex manner based on the parametric model and calculation of the identifiability criterion. A large inaccuracy in the measurement results in a larger control error and a loss of controllability. Moreover, with the loss of identifiability, the measurement problem becomes poorly conditioned. This approach will allow to perform complex diagnostics of transport robots system and in time to identify potentially faulty components and exclude them from the system.

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## PLANNING AND ECONOMIC PERSPECTIVE OF MATERIAL FLOW

(pages 25-29)

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**Keywords:** material flow, planning, costs, economic perspective

**Abstract:** The production is usually divided into quite a number of handling, control and technological operations in the production enterprise, and these are realized at different workplaces. Parts, semi-finished goods, raw materials and products need to be relocated. For this reason, material flow is created. The material flow is an organized movement of material in the production process or circulation of products. It is characterized by the intensity, frequency, direction, performance, structure, character of the transported material and used technique (transport and handling).

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