$$md_{авт} = \frac{\sum d_{авт.i}}{n}.$$

3. Определяем прогнозные значения численности транспортных средств в регионе на исследуемый период времени с учетом расчета доли численности транспортных средств

- прогнозные значения численности грузовых автомобилей в регионе на исследуемый период времени (формула 4)

$$N_{ГА.рег.i} = N_{ГА.РФ} \cdot md_{ГА}; \quad (4)$$

- прогнозные значения численности легковых автомобилей в регионе на исследуемый период времени (формула 5)

$$N_{ЛА.рег.i} = N_{ЛА.РФ} \cdot md_{ЛА}; \quad (5)$$

- прогнозных значений численности автобусов в регионе на исследуемый период времени

$$N_{авт.рег} = N_{авт.РФ} \cdot md_{авт}. \quad (6)$$

Определение прогнозных значений численности подвижного состава автомобильного транспорта необходимо для дальнейших исследований, таких как выявление закономерностей в численности персонала автотранспортной направленности региона.

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Supply chain management systems in transport

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doi: 10.18411/sr-10-06-2021-30

Abstract

The paper analyzes various inventory management systems used in large foreign firms, based on integrated planning in matters of movement of information and material resources. Logistic systems are characterized by the presence of complex random relationships within these systems, which requires not only the distribution of logistics functions among all participants in the supply chain, but also the integration of individual links in the supply chain into a single system enabling to optimally solve the problems of material and information support at all levels of manufacturing processes and to adequately respond to the effects of external factors. These tasks in modern logistics practice are solved by various planning models described in this paper.

Аннотация

В статье рассмотрены современные системы управления запасами, нашедшие применение в ряде крупных зарубежных фирм, основанные на интегрированном планировании в вопросах движения информационных и материальных ресурсов. Функционирование реальных логистических систем характеризуется наличием сложных случайных связей как внутри этих систем, так и в их отношениях с окружающей средой, что требует не только распределения логистических функций между всеми участниками цепей поставок, но и интегрирования отдельных звеньев цепей поставок в единую систему, позволяющую оптимально решать задачи материального и информационного обеспечения на всех уровнях производственных процессов и адекватно реагировать на воздействия внешних факторов. Эти задачи в современной логистической практике решаются различными моделями планирования приведенными в статье.

Late deliveries of raw stock, especially to life-supporting enterprises, due to the fault of transport systems can lead to heavy technical, economic and human losses. Therefore, in order to avoid critical situations because of force majeure factors, appropriate stocks are created at enterprises.

Too low level of stock, in conditions of force majeure, will not allow avoiding serious consequences, such as those indicated above. An increased level of stock leads to freezing of material resources and places a heavy economic burden, leading to severe consequences.

Thus, conflicting requirements are imposed on the level of stock, and the task of logistics is to combine them intelligently. This leads to the emergence of a large number of techniques and inventory management systems (IMS) in economically developed countries, in particular, such as in the USA – Economic Ordering Quantity model (EOQ), Material Requirements Planning (MRP), in the EU countries – Lean production, Enterprise Resource Planning (ERP), in Japan - Kanban.

In the published studies, attention is drawn to such inventory management systems as DDT – Demand-Driven Techniques/Logistics, RP – Requirements/Resource Planning, Rules-Based Reorder (RBR), Quick Response (QR), Continuous Replenishment (CR), Automatic Replenishment (AR), Effective Customer Response (ECR), Vendor Managed Inventory (VMI), JIT II, CSRP-class systems, APS/SCM System (Advanced Planning & Scheduling Supply Chain Management), JIS (Just-in-Sequence), SCP (Supply Chain Planning), SRM (Supplier Relationship Management), CRM (Customer Relationship Management), Lean Production + Six σ , CPFR (Collaborative Planning, Forecasting and Replenishment), S&OP (Sales and Operation Planning), VMI (Vendor Managed Inventory).

It should be noted that the 21st century has brought powerful algorithms and planning technologies. A new age of planning has begun, based on objective consistent models of supply chains, advanced algorithms for optimizing powerful systems for collecting and processing information.

Currently, enterprises use the most complex planning models for key business processes in the logistics systems of inventory management. Through the development of techniques for joint decision-making, modeling of a common business, balancing and multi-structural planning models are complicated by the mixture of planning methods and tasks.

The need for deep interaction between supply chain counterparties, the integration of processes in various elements of the chain, the development of technologies for joint decision-making between supply chain counterparties in planning increase the depth of interaction between participants in the supply chain.

The abundance of techniques, on the one hand, increases the quality of interaction in the “supplier-consumer” system, on the other hand, it indicates the complexity of the problem of optimizing the inventory management system. Despite the abundance of inventory management methods, according to the published research, even in well-oiled systems, for

example, in *Toyota*, the cost of spare parts for one car is USD 77, while in America it is USD 500.

In the Russian Federation, with its road transport network being far from the highest quality, in comparison with the roads of developed industrial countries, this figure is even higher.

Thus, the task of optimizing the inventory management system is far from complete, which explains the authors' interest in this task.

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