

Development of an automated dispatching system for the petroleum products delivery

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Planning the transportation of products has always been given increased attention by both mathematicians and IT specialists. This article is devoted to the development of an automated dispatching system for the petroleum products delivery. What is necessary for building an effective dispatching system for transportation of products? First of all, effective algorithms are needed to construct transportation routes with a minimum (or close to it) cost taking into account all the transportation features. Secondly, software implementation of such algorithms is necessary in the form of an automated system that can independently find (sub)optimal routes based on the customer demand information. At the same time, each company already has its own information systems of different classes (ERP, CRM, WMS), therefore, such a dispatching system should be invariant with respect to already used systems. In the global software market, there are a number of products that solve the problems associated with the transport management and logistics. Such software systems belong to the class of Transportation Management Systems (TMS). According to research conducted by the Gartner agency, in 2014 the market volume of TMS solutions was estimated by \$ 1 232.02 million, and by 2019 it is forecasted to grow to \$ 1,723.87 million. Suppliers of TMS-solutions can be conditionally divided into four groups: 1) suppliers of full-scale solutions in the field of logistics and in related functional areas (Application mega-suite vendors) are, for example, companies SAP and Oracle; 2) supply chain management vendors (SCM suite vendors) that are focused on solving a variety of logistics problems in supply chains. But in the systems of this class there are no modules for financial accounting, personnel management, etc. The most famous suppliers of this group are the companies JDA Software and Manhattan Associates; 3) suppliers of specialized TMS-solutions - the solutions of these suppliers are integrated automation systems in the field of transport logistics, such as PSI Logistics, Kewill, Lean Logistics; 4) service providers for TMS-solutions (TMS services vendors) offer not only software, technological TMS-solutions, but also a wide range of related services for operational management of transport, trucking support and logistics business processes optimization. These companies include C H Robinson (TMS) and Transplace. It should be noted that many companies - developers of specialized TMS-solutions provide and related services in the field of logistics. According to research conducted by Gartner Magic Quadrant for Transportation Management Systems in 2016, the world leaders in the field of transportation management systems are the solutions of SAP, Oracle and JDA Software. The main disadvantage of all the presented systems is that automatic routing of orders does not guarantee the optimization of overhead transportation costs, because the algorithms used are hidden and cannot be analyzed. Besides, most of these systems are additional modules for ERP systems (Enterprise Resource Planning) or WMS (warehouse management systems), what implies their joint application and gives limited opportunities for integration. In this article, the problem of complex construction of an automated dispatching system for the petroleum products delivery is considered. The main result obtained by us is the designed algorithmic and software for such a system.

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