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THE ROLE OF PROGRESSIVE METHODS IN THE DEVELOPMENT OF THE
LOGISTICS SYSTEM

ЛОГИСТИКАЛЫҚ ЖҮЙЕНІ ДАМУДАҒЫ ПРОГРЕССИВТИ
ӘДІСТЕРДІҢ РӨЛІ

РОЛИ ПРОГРЕССИВНЫХ МЕТОДОВ В РАЗВИТИИ ЛОГИСТИЧЕСКОЙ
СИСТЕМЫ

Abstract. The advantages of the MRP system create favorable conditions for its (MRP) application in logistics markets to be profitable and effective. Thus, the mode of operation of these centers depends on the time of year, the political and economic situation in the countries where they operate, the development of the region, etc. The fact that the factors directly depend on the above advantages of the MRP system clearly demonstrates how convenient and economically feasible the use of these technologies is. From the above, it can be concluded that the use of MRP in logistics centers creates the ground for the development of transportation in the region.

Keywords: MRP, logistics, SCM, cargo, concept.

Аңдатпа. MRP жүйесінің артықшылықтары оның (MRP) логистикалық нарықтарда қолданылуы тиімді және тиімді болуы үшін қолайлы жағдайлар жасайды. Осылайша, аталған орталықтардың жұмыс режимі жыл мезгіліне, олар жұмыс істейтін елдердегі саяси және экономикалық жағдайға, аймақтың дамуына және т.б. факторлардың MRP жүйесінің жоғарыда аталған артықшылықтарына тікелей тәуелді болуы осы технологияларды қолданудың қаншалықты ыңғайлы және экономикалық тұрғыдан тиімді екендігін айқын көрсетеді. Жоғарыда айтылғандардан логистикалық орталықтарда MRP қолдану аймақтағы көлік тасымалын дамытуға негіз болады деген қорытындыға келуге болады.

Түйін сөздер: MRP, логистика, SCM, жүк, тұжырымдама.

Аннотация. Преимущества системы MRP создают благоприятные условия для того, чтобы ее (MRP) применение на логистических рынках было выгодным и эффективным. Таким образом, режим работы указанных центров зависит от времени года, политической и экономической ситуации в странах, где они действуют, развития региона и т.д. Тот факт, что факторы напрямую зависят от вышеперечисленных преимуществ системы MRP, наглядно демонстрирует, насколько удобно и экономически целесообразно применение этих

технологий. От вышеизложенного можно прийти к такому выводу, что применение MRP в логистических центрах создает почву для развития транспортных перевозок в регионе.

Ключевые слова: MRP, логистика, SCM, грузовая, концепция.

Introduction. The article discusses the concept of Material Requirements Planning (MRP), MRP II products, the main goals in the MRP application, the processes that arose during the application of the MRP system and its stages, auxiliary functions, and 3 important issues essential for production, and also the basic conditions for material requirements planning. The advantages and disadvantages of this system, the principles of its application in the activities of modern logistics centers, ways to improve the efficiency of production and development of transportation in the region are noted [1].

Main part. In any area of production, resource planning and their rational use are important. It is the distribution and use of resources, whether human or material, in accordance with the needs of the market, that is considered one of the indicators of the success of an enterprise.

In modern times, it is considered more appropriate to apply a concept called Material Requirements Planning (MRP) in planning and using the need for material resources in many industries, especially in the transportation of goods. MRP is a material production planning system. It can also be put simply like this, that is, MRP is computer system-assisted resource management designed to improve enterprise productivity. Businesses use MRP to determine the quantity (volume) of raw materials needed for a product they produce and plan supplies accordingly. MRP is recognized as one of the most modern logistics concepts in the world, and a large number of micrologistics systems have been developed and operate on its basis [2].

Over time, the MRP concept was improved and the development of Enterprise Resource Planning (ERP) software systems gave impetus to the development and implementation of MRP II products in production. Currently, MRP II products are the most modern software, and such programs are rarely found in older production information systems.

The creator of the concept of MRP is an American of Czech origin Joseph Orlinsky (1922-1986). In 1975 he published the first book related to this area. According to his theory, MRP consists of a series of logically related procedures necessary to fulfill production schedules, combining into "requirement chains", synchronized production rhythms (modes) over time and turning each necessary backup component into a planned "purchase" of these requirements.

The first approach to the MRP system occurred in the middle of the twentieth century, then this concept, as a result of the development of computer technology in 1970, began to be widely used.

The MRP system provides a consistent rescheduling of needs when changing the production mode or inventory structure, as well as product attributes.

Usually, the MRP system is calculated in the direction opposite to the product development plan, that is, according to the accepted schedule, it determines the list (quantity) of materials, components, semi-finished products and their parts necessary for the finished product. In other words, this system determines the materials and items needed for the production of a particular product, that is, it helps the manufacturer determine the need for reserve raw materials for production by comparing the needs and supply in the market. At the same time, MRP analyzes input data (bill of lading, shelf life of stored raw materials, etc.) to provide managers with the necessary information on the use of labor and materials to improve the efficiency of the enterprise.

In the international business environment, the concept of MRP is most often used in planning and controlling orders in machine-building and logistics centers, as well as in solving issues related to the supply of a wide variety of purchases and material resources. The use of this system allows the manufacturer to determine the volume (quantity) of the final product and the timing of its production, and at the same time determines the amount of time and material resources to ensure the production regime.

The main goals in applying MRP are:

- production planning and, along with meeting the demand for materials, components and products, supply finished products to consumers;
- ensuring a low level of reserves;
- planning operations for production and purchases, as well as a schedule (table) of delivery.

When using the MRP system, the production schedule is formed in conditions of free demand and automation tools are not used when drawing up the work plan. The plan is drawn up manually subject to the mandatory feasibility of execution (implementation), i.e., taking into account demand and the financial plan. Here, one of the essential issues is the compilation of a list of the main resources needed for each product. This list indicates the shortage of resources and the possibility of its (deficit) compensation. This type of monitoring and control of the production schedule must be continuous. When eliminating defects that may arise in connection with updating the production plan, the production schedule is divided into stages: at the first stage, modification of the plan is not allowed, and at the second stage it is allowed only if.

The MRP system determines the answer to 3 important questions essential for production:

1. What do you need?
2. How much do you need?
3. When is it necessary?

The processes that have arisen when using the MRP system are divided into 4 stages:

Stage I: Their assessment to provide needs and materials. At the beginning of the application of the MRP system, demand and the conditions for its provision are determined. To do this, the MRP system determines specifically the volume (quantity) of the required raw materials and components.

Stage II: Comparison of needs with reserve resources and their (resources) distribution (section). Once the existing resources are identified, the MRP system allocates them precisely to the required areas.

Stage III: Production planning. Given time, the time and amount of labor to complete production is calculated.

Stage IV: Tracking the process. The production process is monitored in order to identify possible problems. The MRP system informs managers about emerging problems and the implementation of a plan to eliminate them without negatively affecting the final result [3].

The main issue in planning the requirements for materials is a wide list of raw materials, components and fees (Bill of Materials - BOM) required for the production (creation) and repair of the product, as well as for the provision of services, which in practice is called the "specification". The specification defines the relationship of the finished product (free requirement) with the components (non-free requirement). Free requirement is created outside of production, non-free requirement refers to the components.

Given the specification, the need for components is fully calculated. The MRP algorithm calculates the quantity of finished products in accordance with the main production schedule (mode of operation) to fully meet the needs of the market. Here, one of the main issues is the accuracy of the primary data. Primary data consists of two reports that perform auxiliary functions - primary (first) and second.

The primary report is as follows:

- Planned orders. This includes a schedule divided into planning steps, indicating the time and quantity (volume) of the order.
- Permission to execute orders according to the plan. Here the volume of stocks (reserve) associated with the admission of materials for production and their use is calculated. After that, materials are allowed for production and orders are fulfilled.
- Changes in orders according to the plan. This includes changes to the time and volume of an order, as well as order cancellations.

The second report consists of the following:

- The report on the control over the implementation of the plan reflects the details of the deviation from it (the plan) and the costs of production.

- A report covering obligations related to supply contracts, purchases and similar procedures, including an assessment of the purchase of materials necessary for production, if necessary in the future.

- The exception report reflects the main inconsistencies and errors found in previous reports

The following information is of particular importance in the application of MRP:

- Name of the finished product. This is usually referred to as free demand or level "0" in the BOM.

- Where and when. How many products are needed to meet the need and when needed.

- Shelf life of stored materials.

- Status of materials in stock: a list of materials in stock, suitable for use and orders issued by the supplier.

- Documents materials (list). Detailed information on materials and components for the manufacture of each product.

- Planning information. This includes restrictions in the manufacture of products or the provision of services, the route of delivery, quality standards, the volume of delivered lots and other primary data.

The MRP system has advantages and disadvantages. The advantageous aspects are as follows:

- Guaranteed availability of materials and components when needed.

- Keeping inventories at a minimum level and saving costs associated with this.

- The minimum time for providing services to clients.

- Increasing the productivity of production.

- Increasing production efficiency.

- Achieve customer satisfaction.

The disadvantages of the MRP system are as follows:

- Strong dependence on primary data.

- The high cost of the system and the complexity of the application.

- Poor response to production schedule changes.

- Desire to keep more than the required amount of inventory. [4;5]

Conclusion. The MRP system allows you to create a schedule in production in conditions of free demand, without using automation tools. The plan is drawn up manually, i.e. taking into account demand and financial plan. Here, the most important issue is the compilation of a list of the main resources needed for each product. This list indicates the shortage of resources and the possibility of its (deficit) compensation. This type of monitoring and control of the production schedule must be continuous. To eliminate defects that may occur due to updating the production plan, the production schedule is divided into stages, that is, at the first stage, modification of the plan is not allowed, and at the second stage it is allowed only if the volume (quantity) of the main resources corresponds to the modification of the production plan.

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