MODERN INFORMATION SYSTEMS FOR AUTOMATED MANAGEMENT OF AUXILIARY PROCESSES

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Abstract: In parallel with the computer technology and the developed models for optimization of the basic and auxiliary processes it is common to apply different methods of organization and automation of these processes. Based on state-of-the-art computer technologies, a new generation of information management systems has been developed. They have been designed to meet the new requirements both to the logistical nature of this information and to the organization approaches of other ancillary information systems. The goal of this article is to approach the nature, role and benefits of the application of automated systems for managing ancillary information systems in practice.

Keywords: COMPUTER TECHNOLOGIES, AUTOMATION OF AUXILIARY INFORMATION PROCESSES, INFORMATION SYSTEMS

1. Introduction

Parallel to computer technologies and developed models for optimization of logistic processes is common to apply different methods of organization and automation of logistic processes. They have been designed to meet new requirements of logistic nature.

2. Essential modern information management systems. Features of the information in these system

Information systems in auxiliary activities can manage material flow either in one single company, but can facilitate the organization of ancillary processes, such as the logistical processes on the territories of the regions, countries and even a group of countries (typical of the EU) [7, 8, 9]. Examining and determining the types of information systems in logistics is shown in Fig.1.

At a company level, information systems are divided into three groups:

- Planned (planned).
- Dispersive (dispatching).
- Executive (operational).

![Types of information systems](image)

Fig.1: Types of information systems

These information systems serve to the auxiliary processes and differ in both functionality and type of subsystems. Therefore the functional subsystems differ according the tasks and technical information, etc. [1,3,5].

Looking at the details of the specific information systems for management, we will find out that:

**Planned information systems**

These systems are set up on high level of governance and serve to make long-term strategic decisions. Typically, tasks such as:

- Creating the logistics chain and optimizing its links.
- Planning of production (basic, auxiliary and other processes).
- Management of technology (manufacturing, transport, etc.).
- Management of inventories and reserves.
- Management of other processes related to logistics.

**Disposable information systems**

These systems are set up on lower level of management, such as warehouses or workshops, and serve to ensure more seamless operations of logistics systems. The following tasks can be addressed and solved:

- Detailed inventory management (storage);
- Management or in-house and warehouse transport;
- Selection of order loads and their acceptance and reporting.

**Executive Information Systems**

They are set up in low administrative or operational management. The processing of information depends on the speed which enters the computer system. This is the so-called real-time model that allows you to observe all necessary information about goods movement then the manager can make administrative and control actions. These logistics information systems can solve different tasks related to material flow control, operational management of production services, material and commodity movement management, etc. These characteristics of the logistic information systems are of a different nature in the context of their functions as subsystems [4].

Creating information systems for materials management at several levels, is always associated with considerable costs. Especially in the field of software development, which on the one hand should ensure the flexibility of the system and on the other - higher degree of integration - in this context, in setting up management systems. In this area, consideration should be given to the use of relatively inexpensive standard software with adaptation to local conditions [2,6,10].

At present, general software packages have been created. But they are not applicable to all types of ancillary information systems. This depends on the level of standardization of the tasks.

Corporate character of these information systems

Effective management of information flows is very important to ensure an appropriate level of implementation of operational operations and proper customer service. Key areas for the use of information flows in these are: timing of delivery of goods, the management of warehouse levels, the reporting of the receipt and execution of orders, the control of consignments and their transportation, not at least the choice of the supply chain [11,12,13].

All of these processes respond to the scope and competence of so-called corporate logistics. Therefore, clear, accurate and timely information should satisfy the customer's requirements for quality information services based on the following principles:

- Accuracy of the information
- Ensure information traceability.
- Easy access to information

Consequently, the automated information system for management of ancillary activities is a new type of system. It is characterized as a system of interconnection of computer technologies with auxiliary processes. This system in combination with the information system, which provides correct information for organizing and implementing the planning and execution of ancillary operations form and define the essence of modern information management systems.
From a functional point of view, these system is focuses on a four situations:
- First Level - performing specific operations: receiving orders, delivering products, accounting for the products, preparing freight, accepting inputs, warehouse operations, etc.;
- Second level - accounting and control issues: equipment management, accounting, product transport control, accounting operations on accounts and issues of funds on accounts, etc.;
- Third level - solving analytic issues: using logistics from the point of view of assisting the marketing operations (sales promotion), forecasting the receipt of orders and forecasting the possiblities for their implementation, financial planning (including logistics costs);
- Fourth level - solving strategic problems: planning of operations at company level, changes in the structure, definition of priority directions in the logistics work for the future. There are three levels of application
  - macro level, external environment of logistics;
  - micro level, internal environment of logistics
  - Company level, level of communication with other companies.

Logistic system has been used to:
- integrate logistics planning
- integrate logistics operations
- developing a logistics strategy.
- integration of the information technologies Integration of information technologies with partner companies;
- Analysis of labor productivity in logistics and quality of logistics operations.

Using computer technologies the user has access to all kinds of databases. Special sets of data can be created in the field of logistics planning, company logistics policy, economic performance and cost accounting.

Requirements for the introduction of modern automated management information systems

The goal of building information systems is to acquire the ability to manage, control, and plan the flow of materials and services, to ensure that information effectively supports these processes, the construction of an automated information system must be based on the basic logistics principles and organizational rules as follows:
- The fullness and validity of information. The logistics information system must provide information on the location, type and completeness necessary to perform the relevant logistics functions and operations. The decision-maker must have the necessary and sufficient information to make the right and accurate decisions.
- Transparency. Transparency of outgoing information is essential for making the right decisions. For example, information on the level of reserves in the distribution network in today's logistics systems does not allow more than 1% of errors or uncertainties in making effective decisions about physical distribution, stockpiling and customer satisfaction. Of great importance is the accuracy and reliability of output data for forecasting demand, planning material resource requirements,
- Just in time. The logistics information must enter the management system in a timely manner, requiring a variety of logistics technologies, especially those based on the "just in time" concept. In fact, timeliness of information is important for all complex logistic functions. In addition, many tasks in the field of transport, operational management, order management and inventory are handled in real time. The requirement for timely receipt and processing of information is through modern logistics technologies for storage, barcoding, electronic data exchange.
- Orientation. Information in this information system should be geared towards identifying additional opportunities to improve product quality, services, and reduce logistics costs. Methods of receiving, transmitting, displaying and processing information should help to identify bottlenecks, resource-saving reserves.

Acceptable data format. The format of the data and messages used in the computer and communication networks of the information system should make maximum use of the technical capabilities (memory capacity, speed, bandwidth, etc.). The types and forms of the documents, the location of the requisites of the paper documents, the size of the data and other parameters must facilitate the computer processing of the information. In addition, information compatibility between the computer and telecommunication systems of intermediaries and other users in the form of data in an information system is also needed.

3. Economic benefits of introducing logistics information systems

The sum of the most important economic benefits from the introduction of automated information systems are as follows:
- Reduce auxiliary time. Thanks to the improved information flow, it is possible to optimize the subsequent transport, warehousing, loading and unloading and production processes in advance and to shorten the time for their implementation.
- Reduce inventory as a result of risk reduction. Timely and reliable information reduces the risks associated with stockpiling. Stocks of raw materials, semi-finished products and finished goods can be partially replaced by stock information or on the way to it.
- Rational use of resources. Timely information on the implementation of logistics channel processes and the state of logistics infrastructure enables more rational use of production factors, such as transport routes, means of transport, loading and unloading facilities or staff.
- High quality of the auxiliary process. By transferring data from one information system to another, the need for multiple data registration is eliminated. This can reduce paper consumption and avoid sources of error,
- Reduce resource consumption. By transferring data from one information system to another, the need for multiple data registration is eliminated. This can reduce paper consumption and avoid sources of error,
- Reduce the cost of data processing. Once registered in the system, the data can be used for calculation and updates.
- Creating a better environmental environment. The introduction of an automated information system will reduce unavoidable environmental pollution and create the conditions for its improvement.

Conclusion

It can be concluded that automated assistive management systems are already from a new generation. They are characterized as systems of interconnection between computer technologies with the reality of the auxiliary processes. It is such a system in conjunction with the information system formed and define the essence of contemporary automated systems management support processes. The economic benefits of their construction are proven.

References


