

Methods and Efficiency of Improving the Logistics Based on Digital Technologies in the Process of Waste Products Recycling in Uzbekistan

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Abstract. This article discusses the methods of creating and developing the necessary products for the development of the logistics system, as well as the practical application of a new mechanism for improving the automated management system, effective illumination of digital technologies and involvement in economic transformation, based on the state of the art and analysis of the modern technologies of the waste processing system. Effective organization of activities of enterprises based on digital technologies in the fields of transformation of waste into new products and waste processing processes by a technologist, improvement of work efficiency of waste processing enterprises in the regions, as well as support. Interaction with external information systems and production processes by developing the material and technical base of the company's resources and software interfaces through fully functional technologies based on digital technologies in order to separate waste products and prepare them for processing in the regions.

Keywords: Waste, modern technologies logistics processing, technologies.

1. INTRODUCTION

Digital technologies in the management of plastic waste in the regions, the sorting of household waste, as an analysis at a time when digital technologies are covering the whole world.

Household waste disposal, the lack of cleaning products, residential complexes and urban waste disposal methods, implemented. Digital technologies bring out the list of enterprises that are not completed on time and are not provided with personnel. I specialized digital removing waste with the help of technologies they are engaged in leaving.

Technological means, all this will determine the situation that causes environmental pollution in the area.

It is necessary to show the waste from residential construction, which leads to the accumulation of waste elements in the regions, through an electronic map, and the use of a digital system will prevent the real danger to public health.

To solve these problems in the provinces, a regional waste management scheme was developed. Improving an effective waste management system in the creation and introduction of digital technologies is a long and complex process, and the implementation scheme creates a basis for creating a modern technology oriented waste management with maximum technological use and minimal waste disposal.

Territorial scheme of waste management defines directions and, ideology, effective creation of implementation mechanisms.

2. LITERATURE ANALYSIS

Issues of the formation of management programs for solid household waste processing AK Golubin, VV Devyatkin, L.Ya. Scientifically studied by Shubov et al.

To date, despite the fact that many studies have been carried out to ensure the stability of regional development, to improve production and consumption waste processes, there is no scientifically comprehensive approach to solving the problem. In the world, there are no established methods and mechanisms for effective management of this market segment. These circumstances determined the choice of the topic of dissertation research, as well as its goals and tasks.

Currently, among the scientists of Uzbekistan S.S.Gulomov, B.Yu.Khodiyev, B.A.Begalov, AN Aripov, T.K.Iminov, M.A.Mahkamova, H.A.Mukhitdinov are at a high level in the field of development of information technologies and communications.

The digital economy is an economic activity in which the main factor in production and service is information in the form of numbers, with the help of processing large amounts of information and analyzing the results of this processing of various types. is to implement more effective solutions than the previous system in production, service,

technologies, devices, storage, product delivery. In other words, the digital economy is an activity connected with the development of digital computer technologies in the provision of online services, electronic payments, Internet trade, crowdfunding and other types of industries.

In our opinion, the digital economy is an economic activity that is implemented and managed with the help of digital technologies in the context of a shortage of economic resources. The main problem facing any economic system is the scarcity of resources, and the digital economy should also focus on solving this problem.

3. RESEARCH METHODOLOGY

It is a way to determine the place in the economy and use modern technologies to improve the processes of creating new products based on digital technologies in the recycling of waste products. In the end, conclusions and suggestions were developed through logical conclusion, scientific abstraction methods.

4. ANALYSIS AND DISCUSSION OF RESULTS

We know that waste is becoming an urgent problem in the world today, so ways to form and develop a single database on processing waste products in the regions are shown;

Recommendations are made for the development of an information center and its optimal use in the development of the logistics of companies processing waste products in the regions;

economic efficiency was calculated based on the introduction of information and communication technologies in the development of logistics [1].

Computer software methods and technologies of artificial intelligence are necessarily used to achieve the required characteristics of products. With their help, a mathematical model of waste disposal technology is built: exact technological parameters, necessary equipment are calculated. The expected ecological, technical and economic effect, the place of introduction of technology and the consumers of the product are determined. Only after that they start physical modeling - the production of laboratory samples and determination of their properties, optimal technological parameters are selected to achieve properties that exceed the patent level. After receiving control samples, they search for ways to put this invention into production by applying for a patent [2].

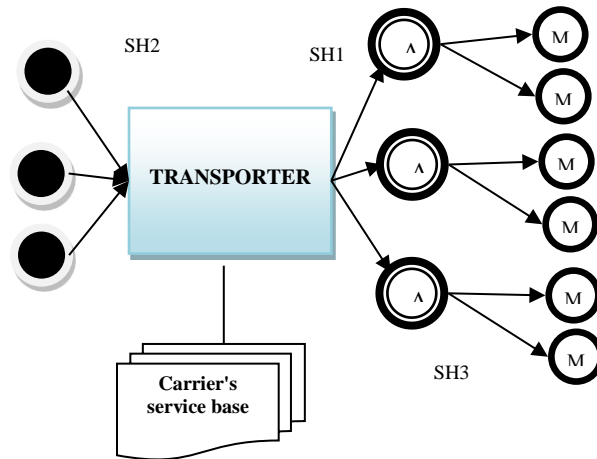


Fig.1. "Direct carrier" drawing

It is possible to use waste for the purpose of obtaining raw materials for the production of construction materials using large tons of waste from other industries.

Introduction of logistics and integrated systems of waste management in the removal of waste from the territory of the regions (Fig. 1)

M - customers ; A – agency network ; Sh 1, Sh 2, Sh Z - contract forms

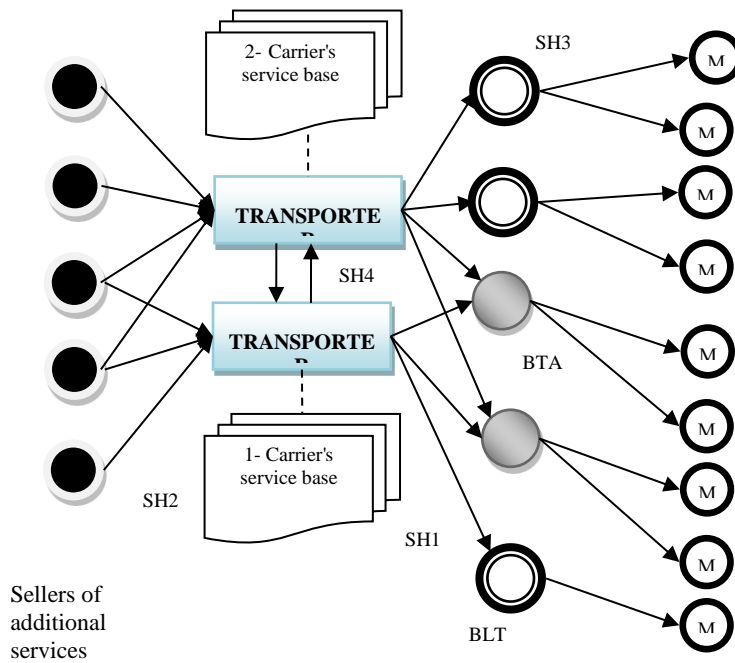


Fig. 2. "Indirect carrier" diagram

BTA - direct carrier agency network; BLT is an agency network of "indirect carriers" that sells integrated services; SH4 – interline agreement.

This scheme is developed on the basis of local authorities self-management, information transmitted by specialists of the bodies. With the participation of regional executive authorities, regional executive authorities, departments and organizations related to environmental protection and sanitary and environmental safety, sanitary system, cleaning and waste management[3].

Information about the target, indicators of waste neutralization, recycling and disposal and the values achieved in approximately 2017 are presented in Table 1. The 1st stage is 2018-2024, the 2nd stage of implementation is 2025-2030. On the basis of digitized technologies, decisions on the elimination of waste products are made quickly; the information system should be considered as a "human-computer" system of information processing . We show the process of its operation in the information system of waste products in the following image (Fig. 3)

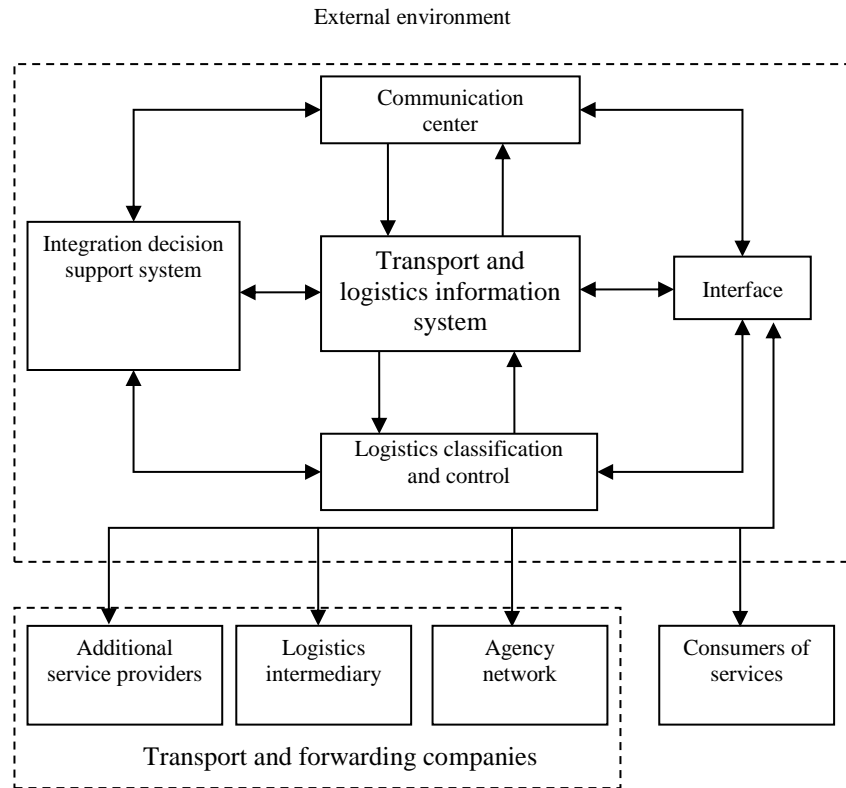


Fig.3. Principle drawing of system integration service to transport-logistics companies

Digital technologies on the basis of which decisions and actions in the process of transportation of goods aimed at the collective implementation of the transport process will be related to the policy of the provided services. This means that the organization of transportation, taking into account the length, quantity and delivery time, will be planned through digitization along with the provision of additional services to the customer[4].

In the USA, 70% of enterprises in various sectors of the economy have assigned the functions of transportation and settlement of accounts to transport companies, and 20-22% of enterprises use the tasks related to setting the price of transportation, warehouse operations, and choosing the optimal delivery route in favor of transport companies. has given up. Also, transport companies have found it useful to take on the function of tracking cargo en route. In addition, they began to deal with the organization of electronic information exchange and storage of information between all participants of the digitized logistics process. As a result, 12-15% of manufacturing enterprises exempted themselves from these functions. Finally, 7-11% of enterprises have outsourced the functions of inventory control, order fulfillment and vehicle fleet operation to carriers[5].

All of the above indicates that transport plays an important role in the movement of goods in the digital system and determines the competitiveness of goods. Thus, due to the above-mentioned factors, it is possible to say that the choice of the carrier increases or decreases the efficiency of the logistics system[6].

Thus, it would be wrong to separate the issues of digital logistics economic or information supply from the material level (cargo and freight transport units, their loading, transportation, storage, etc.) in waste transportation. It is necessary to approach the definition of the concepts of "Logistics Center" and "Cargo Terminal" or "Terminal Complex" with this in mind.

The concept of "cargo terminal" includes not only digital technologies and tools, procedures for collecting, processing and presenting information on the problems of planning and organizing cargo flows, but also all buildings, structures, and equipment in solid waste, cargo processing and storage. it will be correct to include the technology of laying and its organization. Such an object not only collects and processes information about cargo flows, but also processes cargo and material flows, in other words, it is necessary to provide a whole range of logistics services to provide relief to customers. Therefore, the operation of the cargo terminal cannot be imagined without the information, legal and financial support of the processed cargo flows. Thus, a cargo terminal with a full range of logistics services is a digitized logistics center as an independent enterprise. In Uzbekistan , it will be necessary to take into account the

experience of the West and strive to strengthen its role as an integrated logistics partner of waste from industrial and commercial enterprises in accordance with national identity [7].

Based on the results of the research, the drawing of the universal cargo terminal proposed by the author is presented in Figure 4.

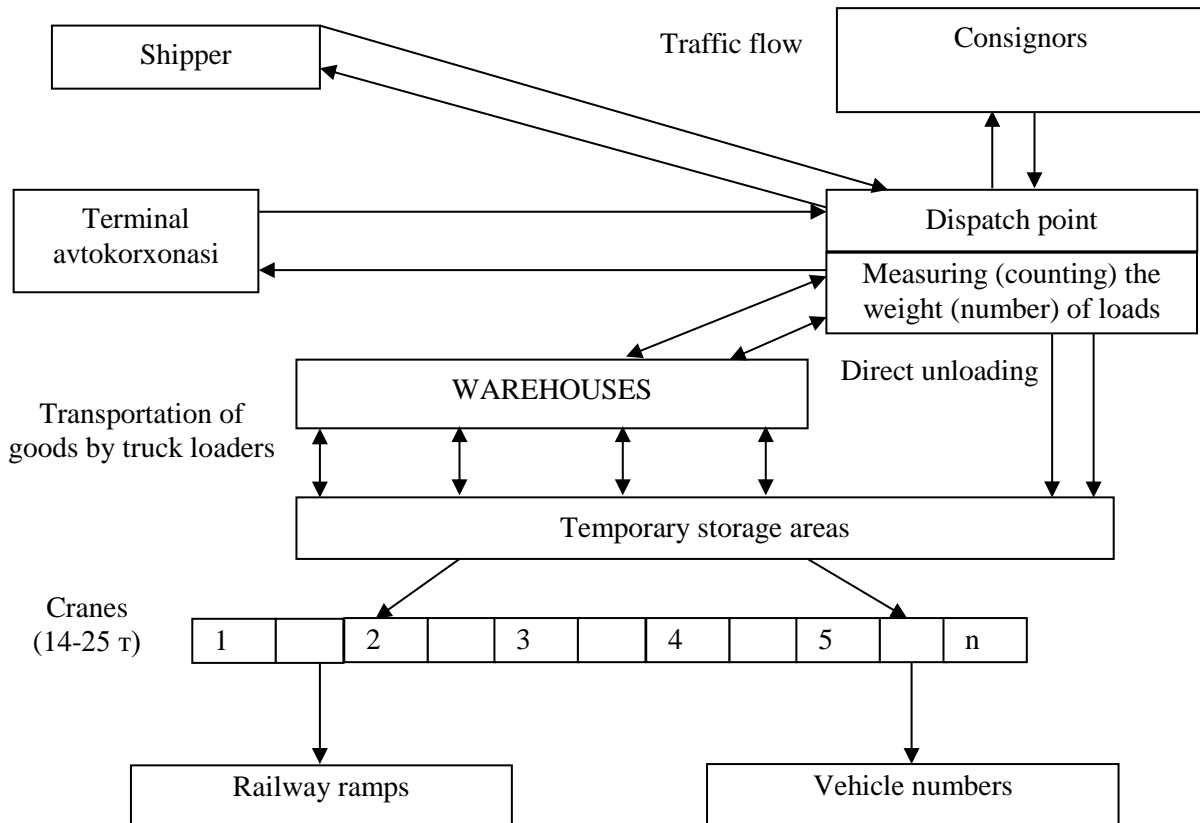


Fig.4. Universal load terminal scheme

New generation terminal complexes can have the following in their composition .

The provision of transport-forwarding services to shippers, consignees and residents of waste cargo as an important segment of the transport market is determined by many circumstances, and the following are particularly important from the point of view of achieving the set tasks:

- creation of an integrated transport-market structure from all types of transport, consumers and institutional structures that ensure the operation of this segment of the transport market in digital technologies, which in turn improves the quality of transport-expedition services, market integration of manufacturers and a digital transport-logistics center ensures high efficiency of activity;
- and the digitized center itself allows carrying out the activities of researching cargo waste and increasing the efficiency of production and commercial activities.

Effective operation of transport-distribution systems to increase economic efficiency - optimization of management and planning of goods and materials and related information and financial flows based on a systematic approach , as well as reconciliation of the economic interests of all participants of the transport-logistics system is carried out[8].

The implementation of the specified economic and strategic tasks directly or indirectly depends on the number of internal and external problems that affect the quality and efficiency of the enterprise's activities. These problems cover various aspects of the company's activities in the following directions:

1. In the economic sphere - increasing the efficiency of activity, increasing income and reducing costs in all types of enterprise activity; successive reduction and elimination of harmful areas of activity; introducing a flexible tariff policy taking into account the demand situation;
2. In the technical and technological sphere - based on the customer's needs, providing the necessary updates in transportation of waste cargo, introduction and expansion of advanced systems of customer

- service; strengthening the material and technical base and improving the technology of the transportation process, which ensures an increase in the level of safety and preparedness;
3. In scientific research in the field of information services - expanding the scope of services market studies; introduction of electronic technology of accounting and rapid information transfer; improvement of the accounting and reporting system of the transportation database;
 4. In the social sphere - to strengthen activity promotion and increase labor productivity; improving the health and ease of work, increasing the level of workers' security;
 5. In the field of enterprise management - improving the organizational structure of enterprise management; restructuring and expropriation of the enterprise;

The research of the market of transport services is carried out in order to obtain the necessary information to determine the further activities of the enterprise. For this purpose, the systematic collection and analysis of information necessary for decision-making related to the transport services market, assessment of market capacity, segmentation and selection of the target market, forecasting and planning of enterprise activities in this market. making and summarizing is meant .

Table 1: "Digitalized Logistics Center" 2022 Cost Forecast by Waste Transportation Cost Elements

Name	2022 year				Total costs
	1 quarter	2 quarters	3 quarters	4 quarters	
Total costs	8 672 261	16,564,521	18 175 668	18 175 668	18 175 668
Plastic	1 230 658	2,251,700	2,251,700	2,251,700	7,985,758
Textiles	295 358	540 408	540 408	540 408	1 916 582
Materials	55 763	77 873	103 185	103 185	340 006
Fuel	2442805	4274710	4274709	4274710	15,266,934
Electricity	6 036	9,000	10,500	10,500	36 036
Depreciation	1 357 125	2,674,049	3 164 439	3 164 439	10,360,052
Maintenance fund	162,969	281 771	369 533	369 533	1 183 806
Other expenses	3 121 547	6,455,010	7 461 194	7 461 194	24,498,944
Including: taxes	454 830	454 830	454 830	454 830	1 819 320

"Digitalized logistics center" provided an extended forecast of waste recycling-economic and commercial activities. On this basis, the problems, risks and difficulties that may arise in the course of the enterprise's activity are identified.

The second level should include the management of household waste from the urban agglomeration.

The generation of waste in urban agglomerations is a container for the level of total collection [9].

Separate containers Containers for leg sets are hazardous waste

Transport containers for special general set Special trans-containers in separate sets Containers for special transport We can analyze hazardous waste

Second level .

Third level .

Sort the elements .

Organization of the operation of special vehicles that provide secondary raw materials for the fourth level of secondary raw materials in the waste landfill for element neutralization and processing for the secondary processing of elements . It is carried out depending on the types of waste transportation. general collection of containers should serve ordinary garbage trucks (side and rear loading), separate - portal and utility for container garbage trucks - hazardous waste as part of special vehicles - with a protected body and a cabin for employees. The third level of

municipal treatment includes sorting (general collection), recycling (with separate collection) and neutralization (hazardous waste) at the level of urban agglomeration.

The main problem of urban agglomerations in digital technologies from the point of view of compatibility is the lack of the above, the condition of the proposed third level is the settings. The fourth level (final) implies.

Throwing household waste (non-toxic) into landfills is unacceptable.

Event, but modern digital technologies are the most traditional in conditions), composition

The work of washing (food waste, fallen leaves) and sending for recycling (regarding the waste that fell into the container and separated from the third.). It is presented in the waste management systems at the regional level of the general scheme of increasing the efficiency of ecological logistics.[11]

In addition to the proposed measures, it is necessary to pay attention to the operational and effective characteristics of vehicles, which are the main communication on waste management of urban agglomerations. When choosing the most optimal traffic composition, the first attention should be paid to the unique requirements that must be met in the ecological "entry" of the logistics system of urban agglomerations (that is, compliance with supply). Relevant technical characteristics, environmental and radiation safety, ergonomics, efficiency, reliability, operational safety. [10].

When choosing the most optimal traffic composition, the first attention should be paid to the unique requirements that must be met in the ecological "entry" of the logistics system of urban agglomerations (that is, compliance with supply). Appropriate technical characteristics, environmental and radiation safety, ergonomics, efficiency, reliability, operational safety level are ensured.

5. CONCLUSIONS

In order to find solutions to existing problems in the implementation of logistics processes of the waste products processing and production system in digital technologies, it is necessary to carry out fundamental research on the basis of the principles of processing of its economic and technical-technological elements, as well as optimization through development improvement.

There are a number of fundamental and applied science areas with Integrative and adaptation characteristics of waste, and one of the most adapted scientific approaches to the characteristics and conditions of production and management and many other types of human activity is its principles.

In processing and application, it can increase the efficiency of enterprises, their competitiveness, and lay the foundation for creating a foundation of success. To do this, it is necessary to develop an enterprise using digital technologies, designed to support the corporate strategy.

According to experts, the main advantages of using digital technologies and their relevance for the enterprises of our country are as follows:

- reduce the level of reserves by 30-50%;
- reduce product movement time by 25-45%;
- reducing repeated warehouse transportation by 1.5-2 times;
- allows to reduce the costs of transportation by car by 7-20% and the costs of transportation by railway by 5-12%.

According to the calculations, in the dissertation, the distribution of the material flows of the existing, main material resources in the considered examples, that is, the value of the occurrence of events in the current period of time, how many times and at what time they happened before does not depend on the past, and does not affect the future. Such a situation determines the difficulty of predicting the movement of digital technologies. This reaffirms that many past and present shipping and receiving points may not be operating regularly.

Such a phenomenon predetermines the optimization of regional waste management systems and the systems they serve, intensification factors.

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