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## Analysis of logistics progress in Poland

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### ABSTRACT

Logistics deals with the flow of goods, services and related information on the scale of the enterprise and the entire market system in order to meet the needs of consumers. Nowadays, we can not imagine the functioning of our society without logistics. The considerations taken up approximate the importance of the role of logistics development management. For this purpose, selected up-to-date literature sources have been taken into account, and an analysis of cargo and passenger transport in 2014-2017 in Poland were presented. This study presents selected results of own questionnaire conducted on a group of 120 people. The aim of the article is to assess the importance of logistic innovations in the process of shaping the effectiveness of a modern enterprise.

**Keywords:** management innovation, logistic management, electronic technology

### 1. INTRODUCTION

The increase in the unpredictability and dynamics of changes in the environment of closer and further enterprises force managers to undertake quick actions ensuring survival and limiting the risk of losses as well as searching for new, future-oriented solutions enhancing the competitive position and value of enterprises managed by them. Enterprises wishing to compete in the market must implement innovations. Nowadays, innovations determine the sustainability of enterprises on the market, their competitiveness and effective customer service. The efficiency of logistics is conditioned by the most modern technical,

technological, organizational and economic solutions. Logistic innovations affect the efficiency of operations, gaining competitive advantage and business development. Efficiency is a measure of the company's performance evaluation. There are many determinants of the company's efficiency. Innovations in logistics bring tangible benefits both in times of crisis and prosperity. They allow to reduce costs, better use of resources and faster response times, and hence the faster response of companies to the ever changing market conditions. Innovativeness of solutions in the area of logistics also allows for a positive distinction on the market. In an industry in which reliability, punctuality and efficient use of resources play a key role, innovations become inevitable. The technological role is particularly important.

The considerations taken up in the article show the importance of the role of innovative logistics management. For this purpose, selected up-to-date references were included, an analysis of cargo and passenger transport in Poland in 2014-2017 was presented, as well as own questionnaire carried out in April-May 2018, in which 120 people residing in the Silesian Voivodeship participated. Respondents answered questions related to logistics in Poland.

## **2. INNOWACJE I ZARZĄDZANIE W LOGISTYCE**

Innovations are the basis for social and economic development. Products and services from which they benefited or been used for a long time solutions quickly become outdated, obsolete. As a consequence, they must be replaced by new, innovative solutions so as not to become an obstacle to development. Developing innovation is a process that requires a lot of knowledge, skills and experience in various fields. It requires large amounts of money, not only financial or material, but also large layers of motivation to complete the whole process. Innovation should therefore be skillfully managed from the beginning, so that it can achieve success thanks to it. Good and well-managed innovation can ensure success and create added value through the effective application of new ideas. It is not only a change in the product or processes in the enterprise, but also in the behavior and conduct of both managers and employees. Over the last decades, the issue of adaptation of innovations on the market has been explored in the context of consumer behavior. The concept of innovation adaptation is related to consumer innovation understood as a degree in which a person relatively early accepts new ideas and ideas of members of a given social system [1]. The concept of consumer innovation is related to the assessment of the level of innovation consumers' interest, their level of knowledge about innovations and the propensity to acquire them [2]. Marketers referred to this type of innovation as implemented or current innovation [3]. Innate innovation is a predisposition to buy new and different products or brands, not to behave with previous choices and consumer behavior patterns [4]. Consumer innovation is part of a wider, more general natural category or innate innovation and evokes innovative behavior of buyers. It is defined as the tendency to buy specific new products immediately after they appear on the market and this is done relatively earlier than the majority of consumers purchasing in this segment [5]. Logistics deals with the flow of goods, services and related information on the scale of the enterprise and the entire market system in order to meet consumers' needs at the lowest costs. Regardless of the profile and size of operations, logistics processes occur in every enterprise and have a significant impact on the implementation of operational and strategic objectives [6]. In order to adapt to the dynamic economic conditions and achieve



### **3. ANALYSIS OF STATISTICAL DATA IN LOGISTIC MANAGEMENT**

Setting the directions of activities and their coordination in the field of creating a modern, effective transport system will allow achieving the right goals and implementation of the transport development strategy. Therefore, it is necessary that transport not only ceases to be a barrier to economic growth, but that it is an important element contributing to its comprehensive development by creating a functionally integrated infrastructure, implementing new transport technologies and providing high quality services in a competitive transport market.

According to J.J. Coyle, E.J. Bardi and C.J. Langley's external factors that influenced the shaping of changes in logistics management include, among others: [13]:



**Figure 2.** Logistic management

[Source: J.J. Coyle, E.J. Bardi, Jr. C.J. Langley, Logistics management, PWE, Warszawa, (2007)]

The development of transport brings together the markets, enables the increase of production, precede economic growth. It is impossible to imagine a global economy, especially during its globalization, without a dense network of routes and transport links enabling manufacturers, exporters and importers to conclude contracts freely regardless of where the goods are located, and where its recipient. Those regions of the world that are

devoid of roads and transport points can not take part in industrial cooperation and international exchange.

**Table 1.** Transportation in 2014-2017

Type \ Year	2014	2015	2016	2017
TRANSPORTATION (in thousands of tons)	1 839 961	1 803 818	1 836 652	2 053 244
Railway transport	227 820	224 320	222 523	239 501
Car transport	1 547 883	1 505 719	1 546 572	1 747 266
including earning	874 260	891 978	954 459	1 104 209
including car transport companies	665 077	705 025	761 160	867 816
Pipeline transport	49 810	54 850	54 058	52 393
Maritime transport	6 781	6 963	7 248	8 254
Inland water transport	7 629	11 928	6 210	5 777
Air Transport	38	38	41	53

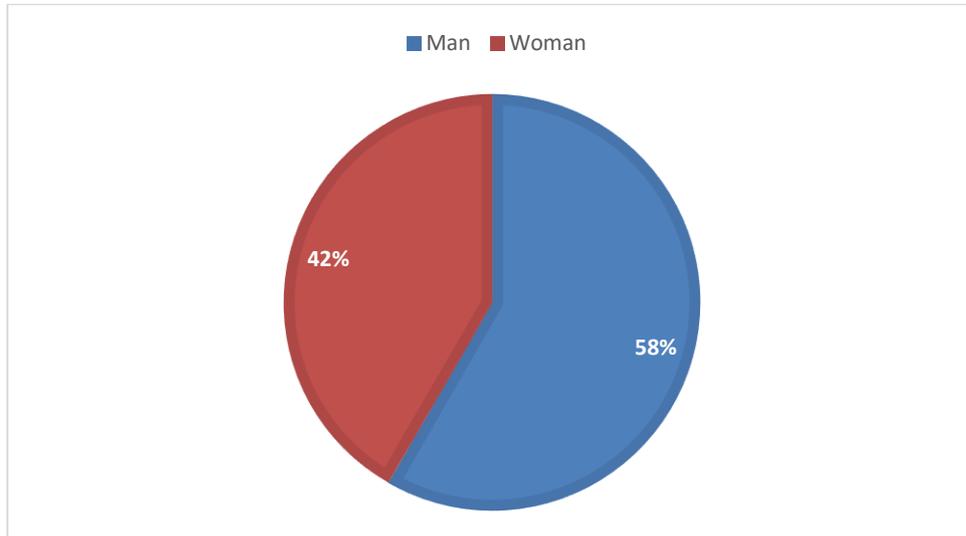
[Source: Central Statistical Office Poland]

Analyzing Table No. 1, it should be noted that in 2014-2017, 5 out of 9 transport modes achieved an annual increase, i.e. commercial car transport, transport in car transport companies, pipeline, sea and air transport. In the analyzed period, the decrease in the volumes of transported cargo concerned rail and road transport, while in 2017 there was a marked increase in this value. The biggest decrease in the number of transported cargo after 2015 was recorded in inland water transport.

#### **4. RESULTS OF OWN QUESTIONNAIRE RESEARCH**

In the research conducted with the use of a questionnaire, in April-May 2018, there were 120 people who lived in the Silesia voivodeship. The questionnaire was made available to students of the Czestochowa University of Technology and posted on internet forums and

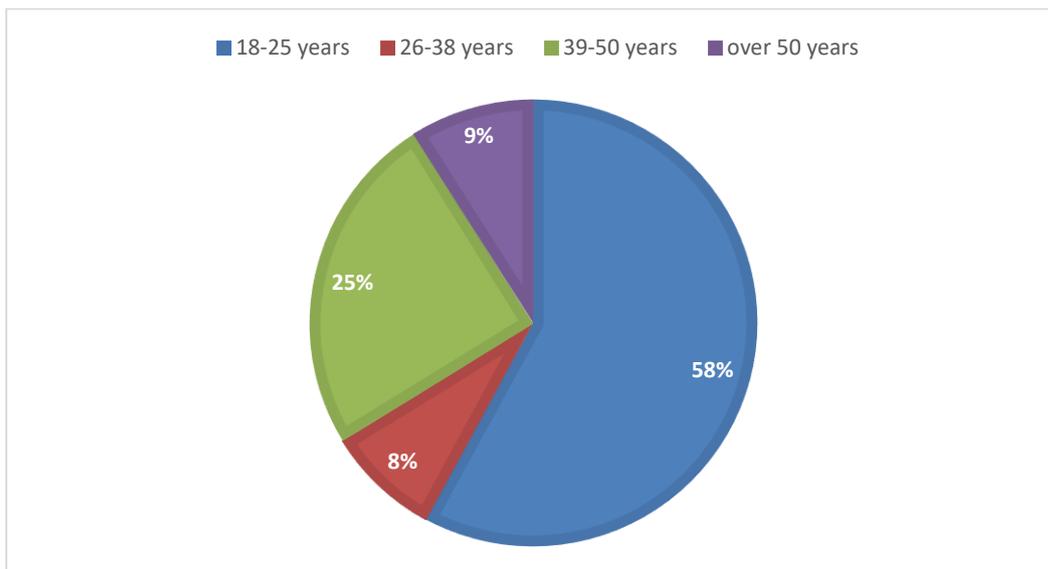
the social networking site Facebook. Respondents answered questions related to logistics in Poland. Answers have been grouped and analyzed, and the survey results are presented below.



**Figure 3.** Gender of respondents.

[Source: own elaboration]

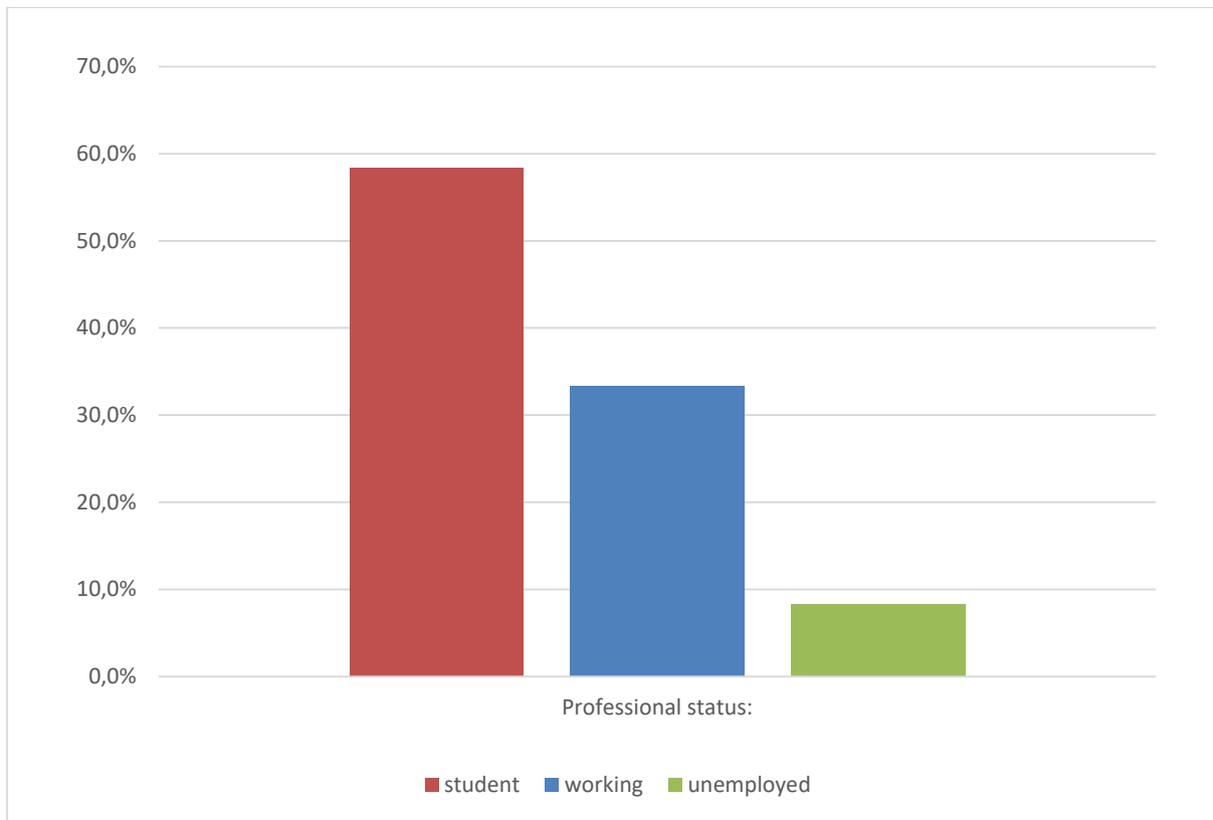
The first part will be devoted to the analysis of the imprint of the respondents. The study involved 50 women, representing 42% of respondents and 70 men, ie 58% of respondents (Figure 3).



**Figure 4.** Age structure of the respondents

[Source: own elaboration]

In the group of respondents, the largest number of people were aged 18-25 years. This group was 58% of respondents, respondents aged 39-50 were 25%, followed by 9% over 50. The respondents aged 26-38 were the smallest group (Figure 4).

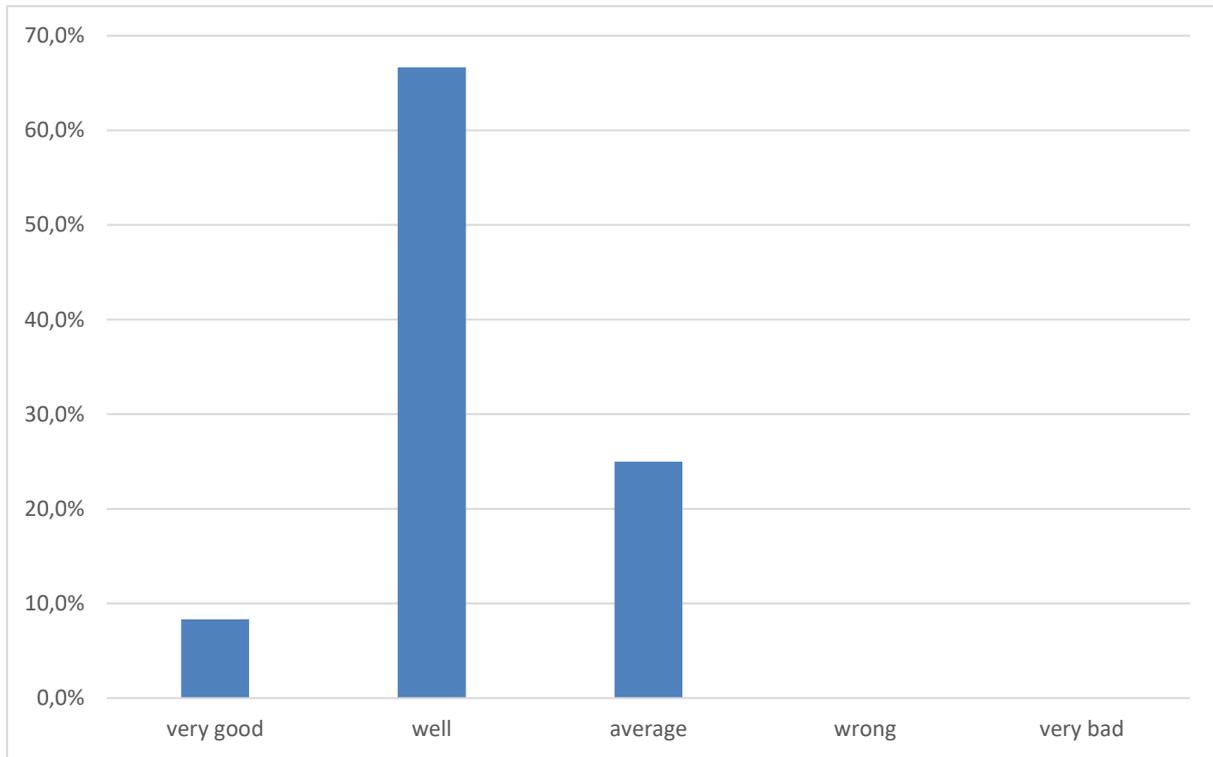


**Figure 5.** professional status of respondents  
[Source: own elaboration]

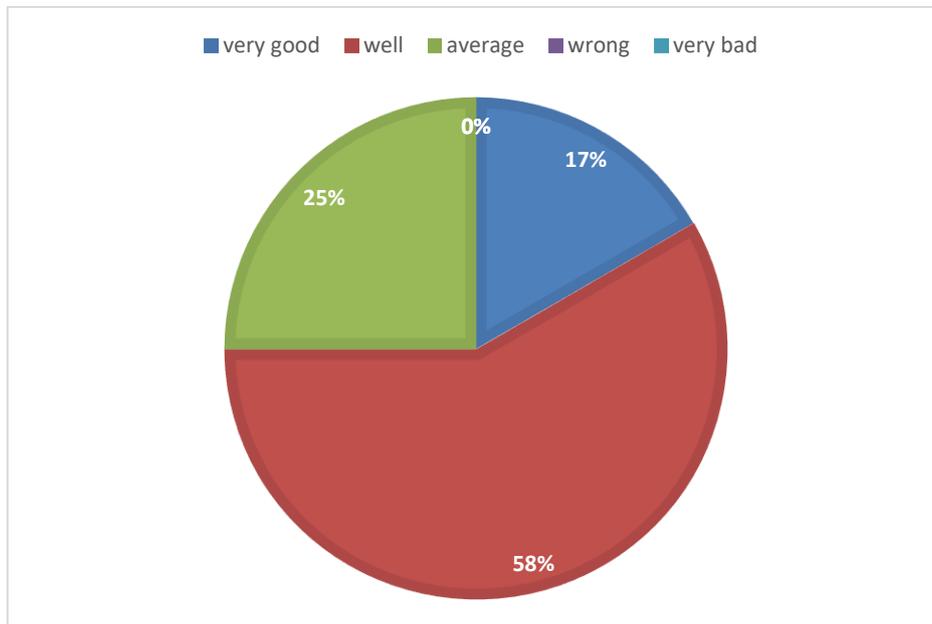
Figure 5 shows the division of respondents into professional status. The largest group are students - 70 people and working - 40 people. The least numerous group of people are unemployed - 10 people (Figure 5).

At the beginning, the respondents were asked to indicate an assessment of logistics development in Poland, 67% (40 men and 40 women) rated well, 25% (20 men and 10 women) average, only 8% (10 men) very good. students and employees most often assessed the development of logistics in Poland well and on average, no one pointed badly and very poorly (Figure 6).

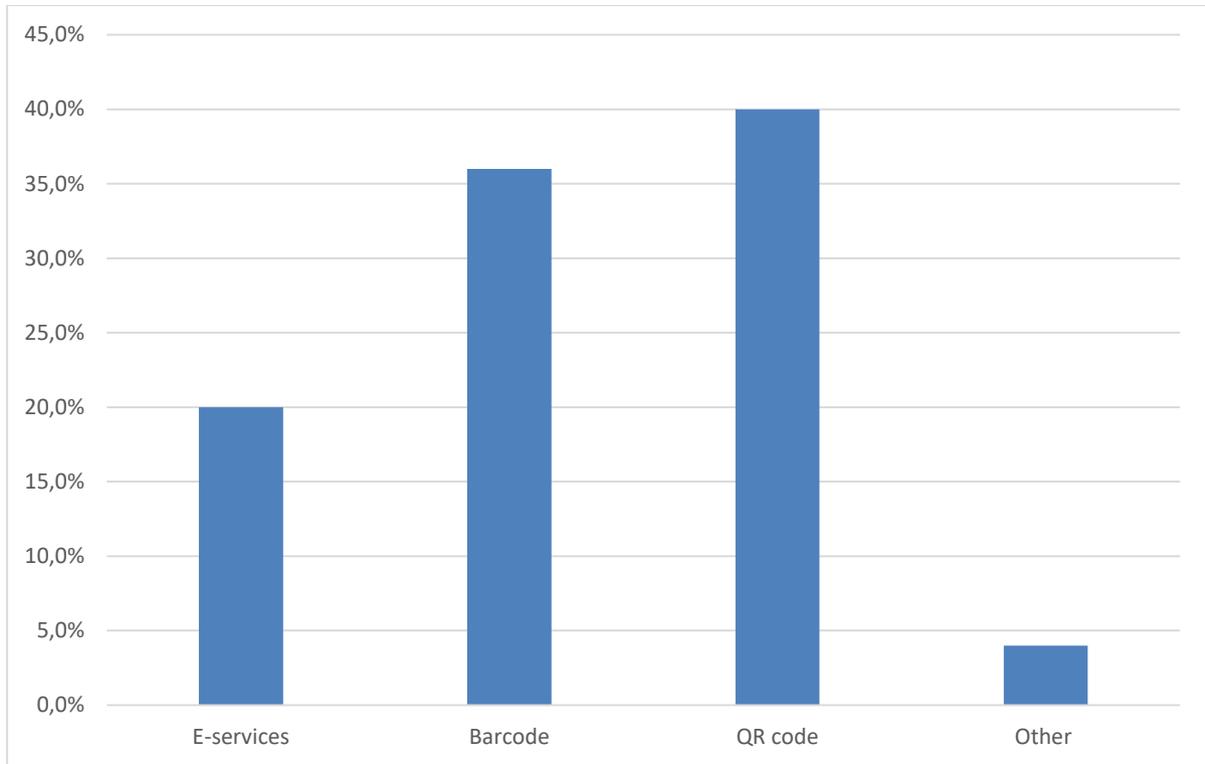
The second question concerned the assessment of the level of innovation in logistics in Poland. Over half of the respondents indicated a good grade, as much as 75% rated well and very well innovation in logistics, only 25% of the asked assessed the level of innovativeness in logistics on average. Men rated the best, 28% gave the answer very well, 42% of men rated well, and 28% on average. Among women, 80% rated well and 20% on average (Figure 7).



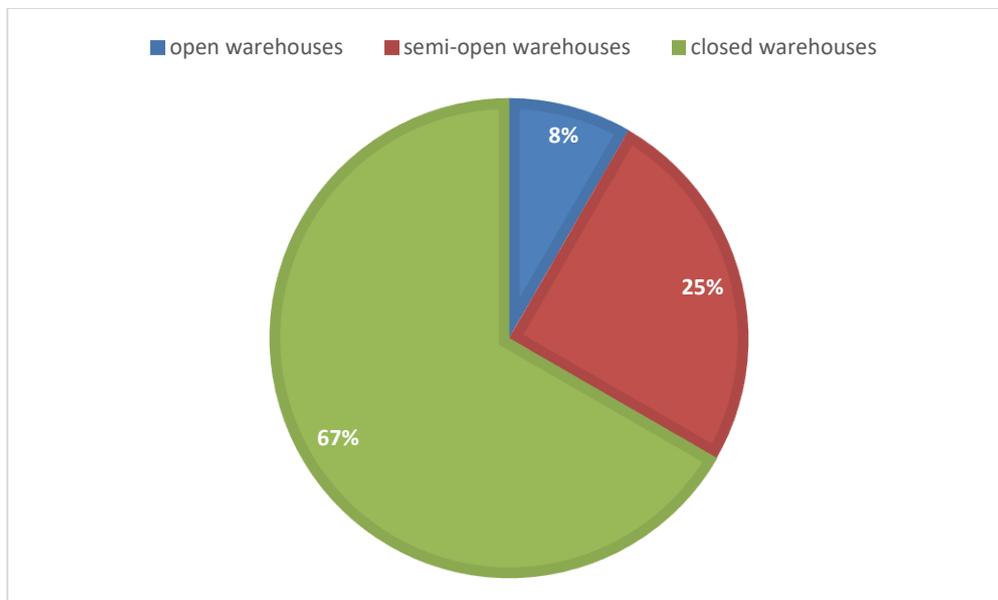
**Figure 6.** Evaluation of the development of logistics in Poland  
[Source: own elaboration]



**Figure 7.** Assessment of the level of innovation in logistics in Poland  
[Source: own elaboration]



**Figure 8.** Used IT systems in logistics in Poland  
[Source: own elaboration]



**Figure 9.** The most frequently used magazines  
[Source: own elaboration]

In the further part of the questionnaire respondents chose the answer to the question about the types of IT systems that they used in logistics in Poland. The most popular among the respondents are QR-40% codes, followed by bar codes - 36% and E-services - 20%. The respondents also had the option to choose the answer "other." This answer was chosen by 4% of respondents in whom they exchanged magnetic paths, RFID radio waves and image recognition (Figure 8).

Figure 9 shows the most frequently used magazines around the respondents. According to the respondents, 67% are closed warehouses, 25% semi-open warehouses and 8% open warehouses.

**Table 2.** The use of modern technologies in the warehouse.

Rating	Results
5	17%
4	83%
3	0,0%
2	0,0%
1	0,0%

[Source: own elaboration]

Another question related to the development of the company through the use of modern technologies in the warehouse. The respondents had the opportunity to choose on a scale of 1 to 5, where 1 meant very bad, and 5 very good. As many as 83% of the respondents indicated the grade 4, ie it will have a good impact and 17% grade 5 ie it will be assessed very well by the application of modern technologies to the development of the enterprise. The results of questionnaire confirm that according to the respondents, the use of modern technologies and innovations is an important factor for the development and growth of the competitiveness of domestic logistics on the European market.

## 5. SUMMARY

Today's enterprises, subject to enormous competitive pressure, are forced to produce higher quality products and services, deliver them over longer distances, react quickly to market changes, improve cooperation with other entities involved in delivering a product or service to a customer, diversify production, take into account the principles of sustainable development and at the same time reduce costs. The competition is won by those companies that respond quickly to changing market conditions and by companies which are able to efficiently manage the flow of goods, services and related information on the scale of the

enterprise and the entire market system. The condition for achieving flexible and effective logistic processes is the implementation of the most modern technical, technological, organizational and economic solutions. Thanks to logistic innovations, it is possible to improve the performance of logistics activities, shorten their duration, maintain the quality of transported and stored goods, shorten delivery time and reduce the costs of these activities while taking into account the principles of sustainable development. Logistic innovations should be adapted to the preferences and expectations of customers, goals and conditions of the company's operation. In conclusion, it should be noted that positive changes are taking place in Poland in the context of innovation. The prospects for the development of logistic services depend on a number of factors that evolve along with changes occurring in the global economy as well as in the logistics industry itself. The most frequently mentioned determinants of logistics development mentioned by the authors include: globalization, increased importance of modern technologies in logistics, domestic conditions, risk in the global supply chain and many other factors. Despite the fact that the determinants of the development of logistics in the European Union are repeated in the research conducted on this subject, each of the analyzes carried out brings additional elements expanding knowledge about the prospects for the development of logistic services. The above-mentioned questionnaire results recommend further detailed research into the development of logistics in Poland.

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