REPUBLIC OF AZERBAIJAN

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ABSTRACT

of the dissertation for the degree of Doctor of Philosophy

ORGANIZATIONAL AND ECONOMIC MECHANISMS OF THE DEVELOPMENT OF DIGITAL TRANSPORT SERVICE IN AZERBAIJAN

Speciality: 5312.01 – "Field economy"

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GENERAL CHARACTERISTICS OF THE WORK

The relevance and degree of development of the topic. Azerbaijan's strategic geographical location plays a crucial role in the development of the transportation sector. The country's position within international transport corridors and its role in these corridors, when combined with digitalization, can strengthen its standing both regionally and globally. In the "Azerbaijan 2030: National Priorities for Socio-Economic Development" program, approved by President Ilham Aliyev, the development of transportation and logistics systems has been identified as a strategic objective. These goals necessitate scientific and practical research to modernize the sector, closely linking it to the application of digitalization in transport services.

The digitalization of transport services in the Republic of Azerbaijan has become one of the key requirements for the country's socio-economic development in the modern era. Rapid technological changes worldwide, the increasing penetration of digitalization into all spheres of life, and the necessity to enhance competitiveness across various segments of the economy highlight the relevance of this topic. The integration of digital technologies into transport services serves as a fundamental tool for automating management processes, improving service quality, enhancing customer satisfaction, and reducing operational costs.

Digitalization ensures the implementation of automated management systems in the transport sector, fosters the development of digital marketing, and facilitates the renewal of business models. As a result, both passenger and freight transportation become more efficient, with processes becoming more transparent and traceable. Furthermore, digitalization enhances the international competitiveness of local transport companies and strengthens the global reputation of Azerbaijan's transport sector.

Azerbaijan possesses significant potential for the development of its transport services, supported by a geographically advantageous position and a well-developed social infrastructure. In an interview with local television channels on January 7, 2025, President Ilham Aliyev emphasized that the rapid development of Azerbaijan's

transport sector continues. To ensure the sustainability of this progress, the efficient application of digital technologies will enable transport services to meet the demands of the modern era. In this regard, related sectors, particularly customs documentation and freight transport management, must ensure the continuous monitoring of cargo, minimize unnecessary difficulties in the transportation process, and reduce both natural and artificial delays.

The primary goal is to efficiently regulate the international transport corridors operating from east to west and vice versa based on international tariffs, ensuring that freight operations remain economically viable while reducing the time required for cargo turnover.

Achieving international standards in the digitalization of transport services in Azerbaijan requires comprehensive research aimed at addressing socio-economic challenges in this sector. Given the critical role of digitalization in transport management subsystems, this topic remains highly relevant. The selection of transport routes, scheduling, and strategic planning are among the key areas that necessitate digital transformation.

Moreover, the integration of resources into the transport sector in Azerbaijan's liberated territories is of particular importance. Conducting scientific research and developing practical recommendations for the advancement of transport services in these regions has become an objective necessity, as these efforts will significantly contribute to the sector’s overall growth.

The expansion of international transport services and their dominant role in the economies of individual countries has necessitated the examination of their impact on the sustainable and continuous development of all sectors of public life from various perspectives. Many Azerbaijani economists have conducted comprehensive research on the development of the transport sector. Notable among these economists are Samadzada Z.A., Ahmadov M.M., Imanov T.I, Cavadov A.A, Hacızada E.M., Abdullayev Z.S., Allahverdiyev S.S., Aliyev E.A., Asadov A.M., Eyvazov E.E., Balabəyova N.SH., and others, who have carried out various studies on the subject. In the works of foreign scholars such as Dinesh Mohan

and Geetam Tivari, Violeta Bulc and Henrik Hololei, among others, the development of the transport sector and digitalization have been explored in-depth. These works provide clarity on the socio-economic aspects of the transport sector and substantiate solutions to various challenges. However, there has been no systematic or specific research dedicated to studying the transport sector as a critical component of the economy, particularly from the perspective of the services it provides, and examining it at all levels. The numerous challenges encountered in the digitalization of transport services in the Republic of Azerbaijan, including their resolution, management, simulation, and the enhancement of service quality, remain unresolved. In light of the global challenges of the modern era, it is essential to determine the directions for the development of transport services that will play a crucial role in Azerbaijan's socio-economic development. Research in both international and national contexts is of great significance, and it is imperative that these studies yield effective outcomes.

The object and subject of the research. The object of the research consists of organizations operating in the field of transport services, including the Azerbaijan Ground Transport Agency, the Azerbaijan Railways Closed Joint Stock Company (CJSC), and other transport entities. The subject of the research involves the management mechanisms of enterprises related to ground transport services, the digitization of management in transport services, and the improvement of their organizational-economic mechanisms.

Research goals and objectives. The main goal of the dissertation is to investigate the scientific-theoretical foundations of the formation of the organizational-economic mechanisms of the digitalization of transport service management in the Republic of Azerbaijan, to analyze the current situation in this direction, to prepare proposals for the improvement of the organizational-economic mechanism of the development of the digital transport service. To achieve this goal, the following tasks have been set:

- To investigate the scientific and methodological foundations of the organizational-economic mechanism of transport services;
- To examine the fundamental principles of digitization in transport services and adopt a scientific approach to intellectual

management systems;

- To explore digital business models in transport and logistics services and substantiate their scientific and practical significance;
- To analyze the organizational-economic mechanisms of digitization in the transport system of the Republic of Azerbaijan;
- To analyze the current state of cargo transportation services in Azerbaijan Railways CJSC;
- To identify ways to improve digital marketing strategies in ground transport service companies;
- To explore the foreign experience of organizational-economic mechanisms in the digitization of international transport services.

Research methods. The research of the dissertation employed methods such as generalization, comparison, analysis-synthesis, mathematical-statistical methods, as well as deduction-induction and a systems approach.

The main provisions defended: The following provisions are presented for the defense of the research work:

- The digitization of Azerbaijan's transport sector, particularly in the improvement and optimization of the management of ground transport services, should always remain at the forefront of theoretical and practical considerations;
- Digital automation and management systems should enhance the efficiency of transport services, improving service quality and increasing customer satisfaction;
- The application of digital marketing strategies in the transport services sector allows companies to reach a broader customer base. To achieve this, they must offer efficient services to generate revenue growth;
- Modern digital business models, especially when applied in ground transport and logistics services, should create conditions for improving customer satisfaction and making revenue growth strategies more effective;

- Based on international experiences and examples, there is a necessity to utilize favorable practices for further improvement of the digitization of Azerbaijan's transport sector. As a result, the application of green technologies used in international practices should minimize the environmental impact of the transport sector;
- The digitization of management systems in ground transport service companies should enable more efficient management of economic and organizational processes, ensuring resource optimization;
- Customer satisfaction can be significantly increased through modern digital technologies and innovative management tools, which will condition the efficient and sustainable development of transport services.

The scientific novelty of the research. The scientific innovations obtained in the research can be presented as follows:

- A new management mechanism has been proposed to ensure the development of digital transport services. This structure enables more efficient application of digitization and may assist in centralizing and optimizing management.
- A new digital marketing mechanism has been introduced to increase the efficiency of marketing activities in transport services. Through this mechanism, digital marketing processes can be utilized to improve the efficiency of transport services.
- New business models for transport and logistics services have been proposed. These models not only aim to increase customer satisfaction and improve service quality but also provide opportunities for transport companies to generate more revenue.
- A mechanism for establishing a digital marketing strategy for ground transport service companies has been introduced. These mechanisms can enhance the strategic significance of digital marketing processes in ground transport service companies and ensure their further development.
- The digitization of ground transport services through mobile applications and the improvement of these services with facial

recognition technology has been proposed. This function is currently unavailable in any ground transport service company within the country. The facial recognition system in ground transport service companies can ensure information security while preventing the leakage of customer data and trip information.

- A new mechanism has been introduced that allows for a more extensive selection of the target audience in social media advertisements. This mechanism enables advertisers to define audience parameters more accurately and comprehensively. As a result, this approach can increase the efficiency of marketing activities, expand the customer base, and positively impact the increase in sales volume. This can strengthen the economic sustainability of the enterprise and solidify its overall market position.

Theoretical and practical significance of research. The theoretical significance of the research lies in the development of scientific approaches to digitization in the transport sector, the formulation of the foundations of digital management mechanisms, and the creation of a theoretical base for studying the impact of digitization on socio-economic processes. Additionally, new research directions related to the application of automated management systems have been identified, and the theoretical substantiation of digital business models has been provided.

The practical significance of the research involves proposing recommendations for the effective application of digitization in Azerbaijan's transport sector, presenting solutions for improving the management mechanisms of ground transport service enterprises, and developing specific methodological approaches for the implementation of digital business models. These findings can serve as a foundation for improving service quality in the transport sector and promoting the broader application of innovative management tools.

Approbation and application. The main scientific-theoretical propositions, results, and recommendations of the dissertation have been published in 6 articles (1 of which is abroad) and 9 theses (3 of

which are abroad) in reputable journals and conference materials recommended by the Higher Attestation Commission under the President of the Republic of Azerbaijan. These include the following conference materials: “Innovative features of taxi services in the Republic of Azerbaijan and its methodological foundations” (Baku, 2022), “Development stages of the transport system in the Republic of Azerbaijan” (Baku, 2021), “Scientific and theoretical foundations of digitization in transport” (Baku, 2022), “Digital transport corridor and its nature” (Turkey, 2022), “Improving the digitization of transport movement: a research on Azerbaijan railways” (Turkey, 2022), “Implementation of automatic management systems in digital transport services in Azerbaijan” (Baku, 2022), “Application of ecologically clean technologies in the transport sector” (Baku, 2024), “Improving digitization in freight and passenger transport in the transport sector” (Baku, 2024), “Modern marketing strategies in transport service development” (Kharkiv, Ukraine-2025), and other reports and theses.

During the research, the author also published the following articles “Направления развития воздушного транспорта в Азербайджане” (Москва, 2022), “Development directions of digital business models in transport and logistics services in the Republic of Azerbaijan”, (Baku, 2022), “Study of foreign experience in the digitalization of international transportations” (Baku, 2022), “Directions for digitalization in the transport sector of the liberated territories” (Ganja, 2022), “Analysis of the current situation of freight transportation digitalization in Azerbaijan railways JSC” (Ganja, 2022), and “Issues of artificial intelligence application in the development of digital transport services” (Baku-2024).

The name of the organization where the dissertation work was performed: Baku Business University.

The total volume of the dissertation with a sign indicating the volume of the structural sections of the dissertation separately. The dissertation consists of an introduction, three chapters, a conclusion and a list of used literature. The introduction is 13455 characters, Chapter I is 61838 characters, Chapter II is 81769 characters, Chapter III is 59513 characters, the conclusion is 10612

characters and the list of used literature is 17360 characters, the total volume is 259261 characters. The number of characters of the dissertation is 227187 characters excluding tables, figures and the list of used literature.

MAIN CONTENTS OF THE WORK

The introductory part of the dissertation, the relevance and degree of development of the topic, the aim and objectives of the research, the object and subject, the main provisions to be defended, the scientific novelty and practical significance of the research, and its approval are explained and justified.

The first chapter of the dissertation is titled **"Scientific and methodological foundations of digital transport service management."** It investigates the scientific and methodological foundations of the organizational and economic mechanisms of transport services, the key principles of digitalization in transport services, scientific approaches to intellectual management systems, as well as digital business models in transport and logistics services and their scientific and practical significance.

The transport sector is considered one of the greatest achievements in human history. The term "transport" originates from the Latin word "trasporto," which means "to change place" literally. In other words, transport ensures the normal functioning of production and the circulation of products in other sectors, fulfilling demand in the process of relocation in a timely manner, establishing a safety mechanism in the transport sector, and minimizing losses.

The primary goal of transport services is to ensure the safe and comfortable transportation and delivery of goods and passengers from one place to another.

Academic Z.A. Samadzada notes that transport, in general, refers to the movement of people and goods and is considered one of the most crucial sectors of public-material production. The transport system includes public railway transport, road transport, maritime transport, river transport, air transport, pipeline transport, as well as

non-public industrial transport [1].

Professor A.M.Asadov in his dissertation titled "Problems of forming a new transport system and ensuring its sustainable development in the Republic of Azerbaijan," states that, thus transport began to develop and improve as an essential component of daily life in society. Naturally, the formation and development of the transport system were influenced by factors such as the lifestyle of society, the country's climatic conditions, geographic location, and so on.[2]

The transportation service plays a significant role in the economic and industrial life of the country. The role of the transport sector in the national economy is crucial because it facilitates the transportation of goods between countries and plays an important role in improving and developing import-export processes between nations.

In order to utilize its operational mechanisms, the transport service controls the work of all transportation modes through the use of transportation operations, organizational decision-making, cargo and passenger transportation, scientific organization of labor and wages, cost determination, and economic methods.

In modern times, parallel to the digitalization of all service sectors, the digitalization of transport services has become one of the important topics. Digitalization refers to the process of converting paper-based information into electronic form for compact, flexible, and efficient use. It involves the creation of digital objects from physical and analog data using information technologies, scanners, and cameras. Digitalization is applied not only to a single sector but across all areas of the economy. The digitalization of the transport system involves the electronic transformation of paper-based information in transport services and the creation of transparency within them.

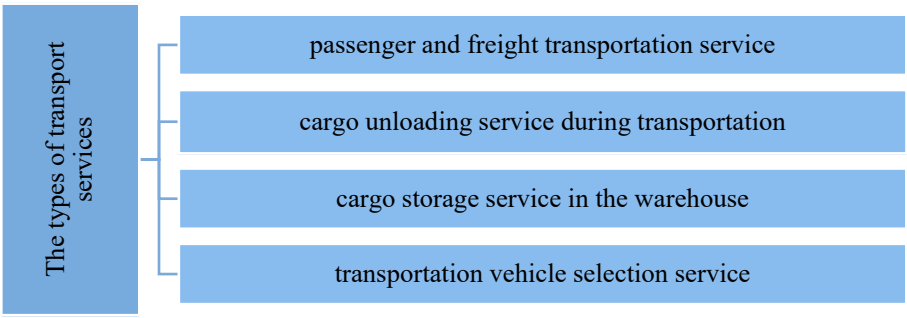
In addition to business information, digitalization in the transport service can be considered one of the most important development factors for the future of the economy. To achieve this, companies are preparing digital strategies. We believe that as a result of

[1] Səmədzadə Z.Ə, Azərbaycan iqtisadiyyatı 100 ildə I-ci cild, Bakı-2021, 635s.

[2] Əsədov A.M, Azərbaycan Respublikasında yeni nəqliyyat sisteminin formalaşması və davamlı inkişafının təmin olunması problemləri, Dissertasiya işi, Bakı - 2022, 274 s.

improvements in the transport service, the level of digitalization can increase, the work process in transport services can be optimized, time efficiency can be achieved, and additionally, the transmission capacity of information in transport infrastructure can improve. The digitalization of public transportation offers new opportunities for transport companies to provide integrated digital services along their service chains to their customers, as well as optimize their transportation operations.

In our opinion, service is not just the execution of transportation operations, but a mechanism for meeting the demand for freight transport. The key factor in the execution of transport services is considered to be the systematic and planned implementation of the transport service. Moreover, in the transport service, it is not only the delivery process of the cargo that matters but also the benefit that the cargo provides to the consumer after delivery, which is one of the most important issues. Each type of transport has different technological solutions, but some require a specific environment. Considering technological solutions and the environment, various types of transportations are carried out. Therefore, the following types of transport services exist (scheme 1).



Scheme 1. The types of transport services

Source: The diagram was created by the author.

The result of processes involving digitalization in transport services has led to the formation of logistics services in this service sector. Logistics services in transport began to form as a scientific field in the

1950s. The term "logistics" was previously used mostly for military purposes because the logistics field taught the movement mechanism of supplies and equipment for military troops.

In modern times, logistics is both associated with the business sector and recognized as an integral part of transport services. Therefore, digital business models related to logistics services have been applied to transport services in foreign practices. In addition to the sequence of logistics services, platform-based business models in transport and logistics are of significant importance.

Platform-based business models in transport and logistics are directly linked to the development of digitalization and technological innovations. Platforms create digital ecosystems that bring together various service providers and customers to optimize supply chains, improve customer services, and reduce operational costs.

The platform model is a business model that brings together different user groups and facilitates their interactions. In addition to connecting customers and suppliers, the platform model provides opportunities for the exchange of services and products. This model is beneficial not only for transport and logistics services but for all business platforms. The main features and importance of the platform model are as follows:

1. Establishing communication**:** The platform model provides an opportunity for exchange between different user groups. For example, in taxi service companies, this platform can bring together drivers and passengers. All issues that arise between drivers and customers can be resolved on the same platform.
2. Increasing the number of users on the platform**:** Users are not only consumers but also active participants in the platform. Therefore, in a platform model, consumers can create content and register their preferences on the service.
3. Increasing network efficiency**:** As the number of users grows, the value of the platform increases. More users generate exchange value. For example, when more people use social media platforms, it leads to more connections and content creation, which ultimately benefits all sectors.
4. Providing services to suppliers: The platform model allows

suppliers (sellers, service providers) to offer direct services to customers. This ensures that customers receive services that are more suited to their needs.

5. Opportunities for innovation**:** The platform model incorporates innovations through user feedback and creativity. Users can help in the development of the platform and the creation of new opportunities. Customer feedback in the platform model expands the capabilities of businesses, helping to solve future problems.

The second chapter of the dissertation is titled **"Analysis and evaluation of the current state of digitalization in transport services in Azerbaijan"**. This section analyzes and evaluates the organizational and economic mechanisms of digitalization in Azerbaijan's transport system, the current state of digitalization of freight transport services in Azerbaijan Railways JSC, and the foreign experience of organizational-economic mechanisms in the digitalization of international transport services with a comparative analysis.

Digitalization of the transport sector elevates traditional transport and logistics operations to a completely new level, enabling faster and more accurate service delivery through real-time data exchange, automated processes, and intelligent management systems. This approach contributes not only to reducing costs and increasing efficiency but also to environmental protection, optimizing energy consumption, and reducing hydrocarbon emissions. As a result of digitalization, both passengers and freight owners benefit from transparent and secure transport services because systems managed by digital technologies significantly enhance the quality and speed of services. Therefore, the statistical indicators of freight and passenger transportation in our republic have been analyzed.

Transport services in the Republic of Azerbaijan are developing day by day. In our country, freight is mainly transported by air, railway, sea, road, pipeline, oil, and gas pipelines, while small detailed goods are transported by postal services. Another important type of transport in our country is passenger transport. In passenger transport, the most commonly used means of transport are buses and private cars.

The statistical indicators of freight and passenger transportation in

the transport sector of our republic, as shown in tables 1 and 2 below, reflect the volume of freight and passenger transportation from 2000 to 2023. These indicators show how much freight and passengers were transported by each sector during this period.

Table 1.

Freight transportation in the transport sector in thousand tons.

	2016	**2020**	**2021**	**2022**	**2023**	**of 2023 compared to 2016 in %**
Total	**222 461**	**188 629**	**193 903**	**218 716**	**229 897**	**+3,3 %**
Railway	15 479	14 631	15 058	18.730	18 276	+18 %
Sea	5807	5982	5468	7519	9 011	+55 %
Sea	160	458	557	407	357	+123%
Pipeline	59 556	56 040	60 298	66 035	68 037	+14,2 %
Oil pipeline	44 129	34 720	35 018	37 782	39 753	-9,9 %
Gas pipeline	15 427	21 320	25 280	28 253	28 284	+83,3 %
Car	141 459	111 518	112 522	112 252	134 216	-5,1 %

Source:Table https://www.stat.gov.az/source/transport/ *compiled by the author based on his data.*

Total transportation volume between 2016 and 2023, the total transportation volume increased from 222.461 million to 229.897 million. Stability is observed over the years, with the only exception being 2020, when the figure dropped to 188.629 million. In the first half of 2023, the total transportation volume showed a slight increase compared to 2022 (5.11%). Along with the statistical indicators presented above, the revenue obtained from passenger transportation in the transport sector is shown in the table below (table 2).

Table 2.

Revenue from passenger transportation in the transport sector (in thousand manats).

Years	Revenue	Railway	Sea	Air	Bus	Metro
2000	134 130	4 285	424	32 925	66 473	4 446
2001	143 478	6 254	401	37 494	68 583	4 552
2002	154 515	6 859	515	44 222	69 501	5 436
2003	179 797	9 751	455	60 794	73 043	5 960
2004	215 933	14 070	704	83 282	79 568	6 450
2005	240 367	17 282	685	96 680	86 314	6 958
2006	273 793	21 901	731	113 439	94 687	7 714
2007	357 017	26 544	625	153 614	121 862	8 530
2008	456 634	41 553	940	192 652	156 349	10 350
2009	479 877	29 447	889	155 437	211 379	11 389
2010	522 669	20 388	1 166	132 319	255 773	28 775
2011	637 933	20 175	4 213	181 853	301 812	28 768
2012	703 159	15 768	1 512	225 628	313 583	40 807
2013	780 503	15 135	1 259	262 433	344 627	42 804
2014	866 888	14 452	1 010	298 624	386 327	42 519
2015	916 207	12 130	812	296 907	423 802	43 005
2016	1 005 292	13 158	698	336 421	458 130	42 262
2017	1 175 120	14 240	932	461 998	487 691	44 322
2018	1 360 696	14 674	1 615	528 459	578 402	54 186
2019	1 956 159	16 600	2 284	1 018 198	643 571	68 917
2020	912 765	4 248	1 128	343 383	408 815	21 623
2021	1 298 349	1 837	2 996	635 110	474 553	26 154
2022	2 239 187	4 827	6 179	1 261 872	681 886	60 750
2023	2 672 397	9 274	3 923	1 473 613	870 662	83 483

Source:Table https://www.stat.gov.az/source/transport/ *compiled by the author based on his data.*

To facilitate a more systematic analysis of the above-presented statistical indicators, an econometric economic model has been developed using the data presented in table format. Through this economic model, the relationships and the strengths of their effects between the indicators have been evaluated. The data presented in the tables played a foundational role in constructing and analyzing the econometric model, resulting in a comprehensive analysis. The econometric economic model is presented in table 3 below.

Table 3.

An econometric economic model between passenger transport revenue and indicators in the transport sector

REVENUE				
METHOD: Least Squares				
TİME: 11/25/24 Time: 22:58				
Sample: 2000 2023				
INDICATORS INCLUDED : 24				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
X1	0.964407	0.220236	4.378979	0.0004
X2	3.280879	2.069232	1.585554	0.1303
X3	0.970036	0.013744	70.57828	0.0000
X4	1.344535	0.035646	37.71858	0.0000
X5	0.847013	0.279975	3.025316	0.0073
C	6612.556	5560.070	1.189294	0.2498
R-squared	0.999865	Mean dependented		820119.4
Adjusted R-squared	0.999827	S.D. dependented		685783.5
S.E. of regression	9022.504	Akaike info criterion		21.26515
Sum squared resid	1.47E+09	Schwarz criterion		21.55966
Log likelihood	-249.1818	Hannan-Quinn criter.		21.34328
F-statistic	26571.67	Durbin-Watson stat		1.959011
Prob(F-statistic)	0.000000			

Source: The econometric economic model was designed by the author.

The explanation of the econometric economic model is as follows:

1. Dependent variable (Y): This is the variable that is being explained. For example, economic growth, consumption, income, and profit are included. Independent variables X1, X2, X3, X4, X5 affect the dependent variable.

2. Method: The least squares method-one of the most widely used statistical methods that attempts to minimize errors in the model's predictions.

3. Observations: The model covers the period from 2000 to 2023,

using data from this period. It includes 24 indicators.

The main results of the econometric economic model are as follows:

Variables and coefficients:

-X1 (railway) (0.964): Very high t-statistic (4.38) and very low p-value (p = 0.0004). This indicates that the impact of X1 on Y is significant.

-X2 (sea) (3.280): For this variable, the p-value (p = 0.13) is greater than the significance level (usually 0.05). This means that X2 does not have a statistically significant impact on Y.

-X3 (air) (0.970): Very high t-statistic (70.58) and p = 0.0000, indicating that this variable is highly significant.

-X4 (bus) (0.847): Significant (p = 0.0073).

-X5 (metro) (1.345): Also has a high level of significance (p = 0.0000).

The strength of the econometric economic model is as follows:

R-squared (0.999865): This indicator shows the ability of the model to explain the change in the dependent variable.

Adjusted R-squared (0.999827): The adjusted R-squared indicator shows the real strength of the model.

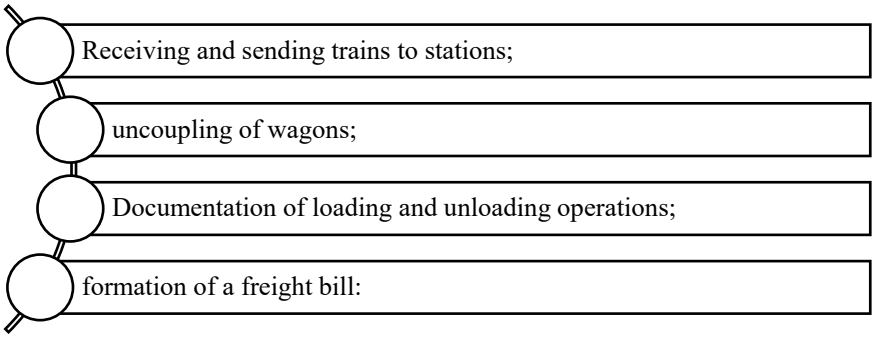
F-statistic (26571.67): This indicates the overall significance of the model. The p-value (which determines whether the results of statistical tests are random) (0.0000) confirms that the model is highly significant.

The conclusion of the econometric economic model on the relationship between income from passenger transportation and the indicators is as follows:

1. The variables X1, X3, X4, and X5 have a significant effect on the dependent variable Y.
2. The effect of X2 is not significant.
3. The model has very strong explanatory power (R-squared is high).

Since the establishment of the railway transport type in the Republic of Azerbaijan, it has been continuously renewed and developed. The enterprise in charge of managing freight transportation in Azerbaijan's railways uses smart software. In our country, there is

land-based, sea-based, air-based, and rail-based freight transport. Professional logistics companies carry out transportation by taking into account the client's needs and requirements, as well as the characteristics of the cargo and budget. There are many advantages to using the smart program in the transportation process. The use of the smart program began in the railway sector in 2017. This program has the following functions (scheme 2).



Scheme 2. Functions of the smart program.

Source: The diagram was created by the author.

As seen in scheme 2, the result of the development of railway transport is primarily the electronicization of freight transport services on railways. The main goal of transport and transit freight transport is to ensure the implementation of issues such as transparency of contracts, electronicization of freight services, and the application of the "one-stop-shop" principle during the execution of international transport through the country's maritime transport, railways, and transit freight transport. Currently, freight transport management in Azerbaijan Railways is carried out by the Closed Joint-Stock Company of Azerbaijan Railways. The system performs the acceptance and delivery of freight trains at international borders. Professor E.A.Aliyev, in his monograph "International transport in the era of globalization: Legal aspects," mentioned that two types of international transport are distinguished based on the transport services involved in the transportation process:

- simple transport;

- complex transport.[3]

By examining the digital transport services of various countries such as Germany, the United Kingdom, Denmark, Latvia, the People's Republic of China, Turkey, and the Republic of South Korea, it would be possible to evaluate the level of development in the sector and propose specific recommendations for future growth by learning from international experiences. Each of these countries differs in terms of their geographic locations, economic strengths, and transport sector strategies. The transport systems of the countries under study can be classified as follows:

1. United Kingdom transport system: The United Kingdom has a modern and extensive network, where railway, bus, metro, and air transport services are provided at high standards. This facilitates the efficient transportation of passengers and goods.
2. Germany transport system: Germany is known for its extensive and developed infrastructure, high-speed railways, efficient road network, and modern airports, which allows for the fast and safe transportation of passengers and freight.
3. Denmark transport system: Despite being a small country, Denmark is recognized for its highly efficient and sustainable transport principles. Particularly, it has advanced experience in urban transport and bicycle infrastructure. Denmark is also famous for its maritime transport, as the country plays a significant role in international trade and freight transportation through its ports. The widespread use of renewable energy sources and environmentally friendly transport vehicles is a unique feature of Denmark’s transport system.
4. Latvia transport system: Latvia is an important transit hub among the Baltic States. Railway and maritime transport play a central role in the country. The port of Riga acts as a regional trade and logistics center. Latvia's strategic proximity to Europe and Asia enhances its transit potential. However, due to limited economic resources, its transport infrastructure is not fully digitalized.

[3] Əliyev E.Ə/ Qloballaşma dövründə beynəlxalq nəqliyyat daşımaları. Monoqrafiya. Bakı-2006, 360 s.

5. People's Republic of China: China is one of the world leaders in the transport sector and can be seen as an example in terms of infrastructure development. The country is one of the global logistics hubs with its high-speed rail lines, extensive road networks, and port systems. With the "Belt and Road" initiative, China plays a crucial role in reshaping global trade routes. The application of artificial intelligence and the digitization processes have led to significant advancements in China's transportation system.

6. Turkey: Turkey's transport sector plays an important role as a transit country. Leveraging its strategic location at both global and regional levels, the country develops air, sea, and rail transport. Istanbul Airport is one of the largest airports in the world, and Turkey is located at the crossroads of international trade routes. Projects such as Marmaray further strengthen Turkey's transport system.

7. Republic of South Korea: South Korea is considered a highly developed country in terms of technology, and this influence is also evident in its transport sector. The country widely applies metro systems, high-speed trains, smart city projects, and automated transportation systems. Digitization and technological innovations make South Korea's transport sector one of the most advanced. Its air and sea ports, especially in the Asia-Pacific region, play a significant role.

The third chapter is titled "Directions for improving the organizational and economic mechanism of digital transport services in Azerbaijan." This chapter outlines the directions for the development of automated management systems in digital transport services in Azerbaijan, ways to improve digital marketing in the Baku passenger transportation company, and the enhancement of the organizational-economic mechanisms of digitalization in freight and passenger transportation within the transport sector.

Automated management systems are designed to perform a function with minimal or no human intervention, integrating sensors and control tools. These systems combine software complexes that allow computer systems, network devices, or machines to operate without manual intervention. Automated management systems enable processes to function without physical human involvement at the

installation site. In automation management, system software ensures the complete automation of processes. This system plays a special role in adapting transport service management to modern requirements. In this regard, the main goal of automation in transport services is to reduce human intervention in all processes within the transport sector.

In the transport sector, automated management systems are directly related to computer systems through digitalization. Broader information systems are also part of this, forming a collection of tools and methods that are interrelated and used to acquire, store, process, and transmit data collected to achieve the set goals.

The widespread application of automated information provision in transport services primarily aims to utilize the programs used in the sector, reflecting the use of e-government capabilities within the system. The management process is usually implemented sequentially within the management system. The objects and subjects of management form a cohesive unit through mutual interaction. In this context, the organizations and the individuals managing them play an important role. In management, both the managed and the manager are assigned specific tasks, duties, and obligations. Political-legal activities and socio-cultural life are also considered unavoidable factors in the management of services provided by transport enterprises.

Digital marketing plays a significant role in the execution of service sales within automated management systems in transport services. The directions for improving digital marketing in transport services include several strategic steps tailored to the organizational and economic conditions of the enterprise, aimed at increasing the relationship between the enterprise's internal and external interactions with customers. Key approaches within these strategic steps are as follows:

1. Understanding the target audience – A thorough market research must be conducted to identify the target audience. This involves collecting statistical data, analyzing customer interests and behaviors, including Google analytics, and conducting surveys on social media. These actions can bring economic benefits to the transport service.

2. Website optimization – The best search engine optimization

practices should be applied to improve search engine rankings. Regularly updating content and resolving technical issues can easily achieve this result.

3. Content marketing – Creating high-quality, valuable content tailored to your audience's interests, utilizing content such as articles, videos, and consistently updating it based on the product, as well as leveraging keywords, will positively influence the enterprise's content marketing. This can also bring economic benefits to the company.

4. Social media presence – Actively participating on relevant social media platforms, regularly posting content, maintaining online engagement with followers, using social media ads to analyze specific statistical indicators, and aligning social platforms with the enterprise's strategy can positively impact the company's image.

The main part of the digital environment in transport services includes the digitalization of transport infrastructure, the integration of transport services into the digital world, and managing transport services through software. One of the key indicators of digitalization in passenger transport within the transport sector is the quality of services used by the public. To assess the effectiveness of digitalization and to address emerging issues, it's essential to review the quality indicators for passengers. These indicators are:

- ensuring the safety of transportation;
- time spent by passengers on the move;
- ensuring regularity of transportation;
- eliminating overcrowding in buses.

CONCLUSION

The theoretical generalizations we have made and the data studied have an impact on the development directions of digitalization in the transport sector and on the development of our national economy. Digitalization in Azerbaijan's transport sector is rapidly progressing with the implementation of modern technologies and digital strategies in the country. This development is linked to changes in both the economic and social spheres. Research shows that modernization and digitalization of transport services are of great importance in

Azerbaijan's economy. The strong technological foundations and state programs implemented at the national level create a basis for ensuring sustainable development in this sector. Cooperation between the public and private sectors, as well as international integration, brightens the future of the country's transport sector. Based on the research conducted, the following conclusions can be drawn:

- The main impact of digitalization is reflected in the increase of economic efficiency in transport services and customer satisfaction. Automated management systems, tracking technologies, and electronic payment methods increase the flexibility of transport services and enrich the customer experience. These technologies also create the conditions for reducing operational costs and improving resource management in the sector.
- According to the results of the dissertation, the application of digital marketing, especially optimizing the search mechanism and using sales strategies for search mechanisms correctly, creates an opportunity for transport companies to become closer to their customers and make their services more recognizable. This increases the competitive power of companies in both local and international markets and ensures the expansion of the customer base. Additionally, the application of intellectual management systems in digital marketing strategies in public transport companies in Baku ensures better accessibility for customers and increases the flexibility of transport services. This trend also strengthens the social-economic impact on the development of the transport sector.
- International experience plays an important role as a model for Azerbaijan and makes it necessary to focus on the application of new technologies in the sector. Digital transport projects implemented in Europe and North America could be beneficial to accelerate the development of this field in Azerbaijan. For example, the integration of automated systems and digital transport platforms could pave the way for applying international digital transport practices in Azerbaijan's private and public sectors.
- The application of digitalization in Azerbaijan's transport sector requires mastering modern management technologies and enhancing the quality of transport services. For more systematic implementation

of the digitalization process, state support, development of innovative business models, and application of intellectual management systems are of great importance. This approach not only increases the competitiveness of the transport sector but also contributes to accelerating the national economic development.

- Digitalization in Azerbaijan's transport sector, especially the application of intellectual management systems, is crucial for improving service quality and enhancing management mechanisms. The development of digital ecosystems increases the transparency, efficiency, and operationality of transport operations, ensuring competitiveness both in domestic and international markets. The results we have obtained suggest that digitalization not only has technical importance in transport services but also provides a guarantee for the economic and social development of transport services. Improving management systems and strengthening public-private partnerships also supports the efficient application of digitalization. Coordination between the public and private sectors accelerates the implementation of innovative projects in the sector. As a result, Azerbaijan's transport sector becomes more efficient and competitive in both regional and international markets. Based on the theoretical-methodological issues studied and the analysis carried out, the following recommendations are deemed appropriate:

1. Developing search mechanism sales strategies on search platforms is part of the company's marketing activities. The goal of increasing socio-economic efficiency in this field is for transport companies to integrate their websites into search rankings and enhance the online visibility of their business strategies. Through search mechanism sales campaigns, transport companies can attract more customers by using Google ads and other advertising platforms. These strategies will increase the effectiveness of marketing activities by reaching a wider audience and ensuring the services provided by the company are more widely known. Thus, search mechanism sales strategies play an important role in strengthening the marketing activities of transport companies and can increase their competitiveness in the market.
2. Transport companies should optimize their websites using

search engine optimization tools so passengers can more easily find them. The content and structure of websites should be optimized and designed according to key keywords and customer search queries. Search engine optimization will also help services be easily found by customers, thus increasing customer acquisition in passenger transportation.

3. It is advisable for transport companies to prioritize presenting their mobile applications to a broader audience through search engine optimization and search mechanism sales strategies on search platforms. Mobile applications can provide passengers with easier access to services such as ticket purchases, payments, and route information. Search engine optimization can ensure that the applications appear in higher positions on search engines. Through search engine optimization, more resources can be allocated for the promotion of applications, thus expanding the user base. Additionally, after the mobile applications are presented through search engine optimization and sales strategies, it can positively affect the company's economic interests and increase its revenue.

4. Increasing customer appeal through digital services and search engine optimization on search platforms is essential. Expanding digital services in the transport sector should be supported by search engine optimization to increase customer acquisition. When user platforms and online payment systems are provided for customers, search engine optimization will ensure that these services are more easily found and used by a larger audience. Therefore, by directing customers to Google search engines and guiding them to online platforms, the usage of services can be increased.

5. The application of intellectual management systems in passenger transportation is crucial for route optimization and improving passenger satisfaction. These systems allow the tracking of vehicle locations in real-time and ensure proper direction. The use of tracking systems can provide more efficient and timely services to passengers.

6. The development of digital logistics models in freight transport is necessary to improve efficiency in freight transportation. Special platforms should be developed through which transportation processes

can be managed in a more agile and rapid manner, and at the same time, the service quality for customers can be enhanced.

7. The process of engaging employees in training should be implemented. Increasing the knowledge and skills of transport service employees regarding digital technologies is crucial for strengthening the organizational structure. Organizing regular training in the use of digital tools not only ensures the professional development of employees but also helps in the accurate execution of functions within the organizational structure and optimizes management. This approach can also support the integration of digital technologies into the business processes of the company, increasing overall work efficiency.

8. Strengthening public-private partnerships will accelerate the financing and implementation of digitalization projects. This collaboration can create broad opportunities for the implementation of innovative projects in the sector by combining resources from both the public and private sectors.

9. To accelerate digital processes in the transport sector, the development of information management systems is crucial. Through these systems, the analysis of transport services can be enhanced, ensuring more efficient use of resources and supporting the optimization of operations. The application of information management systems can help in monitoring transport networks and using modern technologies for operational decision-making.

10. In the research work, we have proposed digital business models. These digital business models teach newly established companies in the transport sector how to generate revenue. Freight transport and logistics companies can earn revenue by providing transportation services or developing logistics software.

11. As mentioned in the research, the IT department exists in the organizational structure of “AYNA.” We have proposed a new organizational structure for the IT department of “AYNA.” By implementing the newly proposed structure, the IT department can be further digitized, reducing the workforce and increasing the efficiency of work in state institutions.

12. We have proposed a digital strategy mechanism for marketing

activities in transport in Baku. The implementation of digital strategies in marketing activities in transport in Baku will speed up the development of digital platforms and the customer acquisition process, as well as expand the use of marketing research.

In conclusion, the development of digitalization and the application of modern technologies in Azerbaijan's transport sector are demonstrating positive impacts in both economic and social fields. The analyses presented in the dissertation have shown that the application of digital services and the development of innovative management systems are of great importance for increasing the sector's productivity and improving customer satisfaction. The use of strategic tools such as search engine optimization and sales strategies for search mechanisms will allow transport companies in Azerbaijan to increase their competitiveness in international markets. To implement these, it is important to establish closer cooperation between the public and private sectors and to benefit from international experiences. Not only the application of modern technologies but also the improvement of the digital skills of the workforce can ensure efficient and sustainable development in the sector. Through the optimization of transport services, increasing customer acquisition, and implementing innovative projects, Azerbaijan aims to strengthen its position in regional and international markets. Thus, digitalization and technological innovations can create new opportunities for the development of the transport sector and positively impact Azerbaijan's economy.

The main provisions of the dissertation work, the results obtained and the proposals made are reflected in the following published scientific works:

1. Направления развития воздушного транспорта в Азербайджане // – Moskva: Экономика и менеджмент, 2022, №-4. – p. 102-109.
2. Development directions of digital business models in transport and logistics services in the Republic of Azerbaijan // – Baku: "Audit" journal, 2022, №-3. – p. 66-74.
3. Study of foreign experience in the digitalization of international

transportations // – Baku: “Cooperation university” Scientific-practical journal, 2022, № 4 (67). – p. 137-143.

4. Directions for digitalization in the transport sector of the liberated territories // – Ganja: “Scientific works journal”, 2022, №-3. – p. 90-95.

5. Analysis of the current situation of freight transportation digitalization in “Azerbaijan Railways JSC”// – Ganja: “Innovative economics and management journal”, 2022, №-3. – p. 107-113.

6. Issues of artificial intelligence application in the development of digital transport services // – Baku: “Audit” journal, 2024. – p. 83-91.

7. Innovative features of taxi services in the Republic of Azerbaijan and its methodological foundations // – Baku: "Quality assurance as the main factor of competitive economic development" conference material dedicated to the 99th anniversary of the birth of national leader Heydar Aliyev, 2022. - p. 427-429.

8. Development stages of the transport system in the Republic of Azerbaijan // – Baku: Center for scientific research, conference proceedings, 2021, Volume 1, No-4. - p. 9-11.

9. Scientific and theoretical foundations of digitization in transport // – Ganja: Azerbaijan University of Technology, conference material, 2022. Part 1. - p. 79-80.

10. Digital transport corridor and its nature. // – Turkey: International anatolian scientific research congress international anatolian scientific research congress, 2022 october 25. – p.102-104

11. İmproving the digitization of transport movement a charts: a research on Azerbaijan railways. // – Turkey: International anatolian scientific research congress international anatolian scientific research congress, 2022 october 25. – p. 104-106

12. İmplementation of automatic management systems in digital transport service in Azerbaijan. // – Baku: International Baku scientific research congress, 2022 november 30 december 01, №-4, – p. 15-25.

13. Application of ecologically clean technologies in the transport sector. // – Baku: Proceedings of the conference dedicated to the ear of Ssolidarity for a green world sustainable environment: Transition to green energy, 2024, 6 December. - p. 451-454.

14. Improving digitization in freight and passenger transport in the

transport sector. // – Baku: "Green economy as a model of sustainable development" conference material dedicated to the 101st anniversary of the birth of national leader Heydar Aliyev. 2024, April 24. - p. 330-331.

15. Modern marketing strategies in transport service development. // – Xarkov, Ukrayna: Организационные и учетно-финансовые механизмы управления экономической безопасностью предприятия adlı konfrans materialı. 2025. – p. 237-239.

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