



Digital Technology Employment in Small Business Entities

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Abstract

Digital Transformation is today’s hot process in small business entities like logistics companies, for instance. This trend is happening not only in Uzbekistan but all over World as well. Each second automotive and cutting-edge technologies are being created to maintain the delivery of products to the real customers as quick as possible. Likewise, Logistics companies are encountering largescale automation of corporate information system and trying to be more resistant in the competitive market with the help of digitalization. Likewise, the challenges of automation, new technology and the future of work are some of the most important facing workers today. For trade unions, we must be strong enough to be able to shape change. Understanding potential impacts and opportunities for our members and preparing the appropriate responses are key. This includes enhancing our engagement with industry partners and identifying appropriate education, training and capacity-building needs of our members and workers in the transport chain. Transport workers of today and tomorrow must be equipped with the required knowledge, skills, and expertise for the jobs of tomorrow. In spite of the having of hundreds of research works in this field, there are still a bit uncertainty in understanding the employing the digitalization in small business entities (logistics companies as example). This article reflects the development of digital logistics and transport in the process of globalization, and thus shows how to adapt the concept of information and communication technologies. Moreover, shedding light on the role of information and communication technology (ICT) in the logistics innovation process of small and medium sized logistics companies.

Keywords: Information and communication technology (ICT) adoption; digitization; logistics industry; logistics management; globalization; cutting-edge technologies; fully autonomous.

1. Introduction

Economic World is seeing the globalization as a main catalyst to enhance every companys’ improvement. For companies competing in highly dynamic markets, the search for new resource of competitive advantage is vital. As the current and future modernization of the transport sector, it is now real time to apply new types and methods of relations between transport organizations and consumers. In many cases, this has revolutionized the way companies operate. From history, technology was viewed as a mechanism of productivity in manufacturing industries. However, in these current days, technology is even believed to have greater importance in the services sector fueling growth by offering small business firms important competitive edge. Technological advancement in services is often based on the adoption of information and communication technology and is strongly connected with higher levels of productivity in firms. Modern information systems are characterized by the creation of a single-integrated information cloud for all participants in the interaction.¹ The breadth of the country’s territory and the need to cover the most remote areas with transport services are increasing the dependence of the transport infrastructure on high innovative information technologies. The implementation of these technologies has already employed in many segments of the transport chain and will continue to have clues on all transport spheres soon. With all respect to small business entities, the applying of these technologies and automation process seems to be evolutionary.

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It is commonly true that the use of digital and smart information technologies in the management of the logistics sector fetches numerous useful features. For example, due to the active use of information technology, the receipt of new orders, as well as the delivery process and transportation of goods, warehouse management and fleet of vehicles, supply chain relations are significantly accelerated. As a result of increasing the speed of these processes, the order fulfillment time is reduced from the customer's point of view, the reduction of paper document flow reduces the role of human factor, which leads to lower material costs. In addition, Scientific discoveries embodied in digitalization create new opportunities for resources, provide business growth potential, mechanisms for interaction between economic entities, new markets, and industries.

2. Literature Review

Since the 1990s, ICT has had a huge effect on companies and business environments leading to the creation of the network economy .It enhances the efficiency of firms' operations, accelerating the innovation process and generating added value for businesses. This can be easily seen in the logistics and supply chain management (SCM) context where ICT impacts both company's strategic and operational levels. It has transformed companies' internal logistics operations as well as their external relationships with suppliers, intermediaries, 3PLs, and customers. The globalization of supply chain systems requires that information is transferred and managed internationally (Barbosa and Musette, 2019). A common view is that ICT has a profound impact on the management of supply chains as new technologies greatly facilitate the flow of information, as well as extending control over remote operations and other organizational boundaries The most important contributions of ICT in supply chains are to create end-to-end visibility, reduce cycle time and inventories, improve the overall effectiveness of distribution channels.

As a result of globalization, growth in trade and regulation of transportation worldwide, logistics is gaining importance. Today, many companies are outsourcing their logistics services to logistics firms so that they can focus on their core business and take advantage of opportunities to reduce costs and improve flexibility. From an economic perspective, two macro factors appear to drive the globalization trend (Frankel, 2016). The first is the reduction in barriers to the flow of goods, services and capital that has occurred. The second factor is technological changes, mainly in recent years, dramatic changes in communication, information processing and transportation technologies. Müller, (2014), states that the most important link is the creation of a world information system, a global network of IT connections using the Internet. The information technology system is supported by the regular and mobile telephone network through satellite communication. According to Lianguang and Hertz (2017) "The logistics industry is constantly growing due to the growth of logistics firms and market consolidation. "Some logistics firms are even among the largest in the world today." (p. 1004). It can be seen that the Internet is one of the main factors for the development of digital logistics.

The world market, which continues its technological innovation, has forced enterprises to look for new ways of innovation. From a strategic point of view, organizations (more precisely, logistics organizations) need to learn better and faster than their competitors through "proper coordination with the environment. As the industry concept evolves, so does the logistics concept. The logistics industry." emphasizing the development of key features of "continuous improvement of manufacturers' requirements for high efficiency and continuous improvement of customer requirements for high level of service" (Maslaric, Nikolicic, Mircetic 2016, p. 511). Current and future it is necessary to develop a new concept of logistics organizations facing industrial practice. The solution can be in a new operational, organizational and management standard - on the Internet. Digitization of business models can allow logistics companies to work in tandem to achieve a mutual goal.

3. Methodology

The research methodology includes systematization of foreign developments and domestic transport and logistics system on a digital platform that provides interaction of supply chain participants in order to improve the logistics companies' performance.

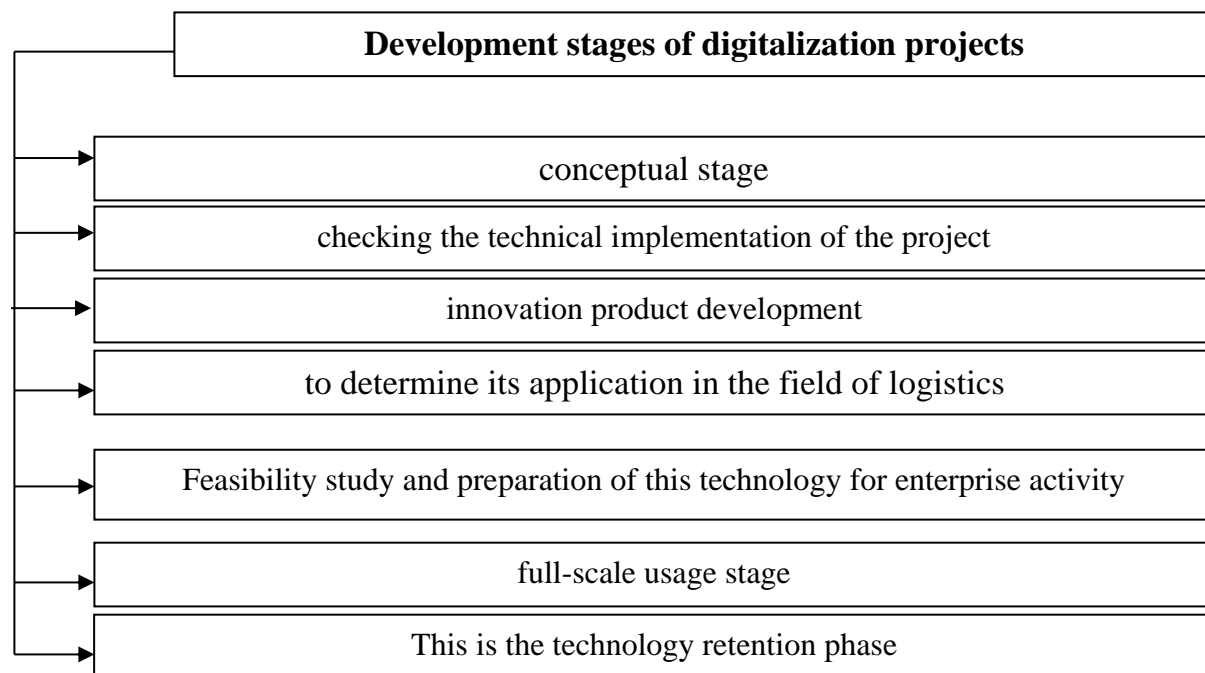
3.1 Digital Technology Adoption In Small Business Entities

The world is interconnected through global trade based on a transportation industry striving to be more and more efficient. Every year 62.7 trillion tonne-miles of cargo are transported around the world. At the same time, new technologies and automation are displacing some jobs and creating new ones, thereby impacting employment in general. This has led to a wide discussion about the consequences of automation and technology and the effects that this may have for society at large. Governments, the business sector, trade unions, regulatory bodies and other stakeholders have a keen interest in the discussion of what the consequences of the Fourth Industrial Revolution will

be, and how society at large can be prepared for the transformations that may arise from further introduction of advanced technologies and automation.

Across industries several trends have been evolving around digitalization, increased levels of interconnectivity in production processes and advanced levels of automation. The implementation of these technologies has already started in many segments of the transport chain and will continue to have effects on all transport modes in the future. The stages of development of digitalization projects can be represented by table 1 below. Digital logistics provides end-to-end visibility of inventory, orders, shipments across the supply chain. It reduces inventory levels across the network, maximizes customer satisfaction and dynamically responds to logistics events. There is a central command and control center to assist in decision making. Thus, the system becomes very efficient. Increased visibility of performance indicators to help continuous improvement. All the information is available online and allows people to filter the information and get a comprehensive knowledge of the issues, if any. With a GPS tracking system, everything becomes easier. The parcel can be tracked in real time from anywhere in the world. A slight delay on the way of the parcel is immediately known to all concerned. And if there is a need to change direction, it can be done as soon as possible. With the advent of digital logistics, it has become very easy to deal with lost packages, mis-delivery and package delivery failures. Weather conditions are forecast, deliveries are planned accordingly. From the moment the item is picked up from the warehouse until it reaches its destination, the entire journey is digitally mapped.

Table 1: Development stages of digitalization projects²



The conceptual stage is the most important stage. At this stage, the innovative concept (essence) is fully formed, its definition is given, the economic effect of the project being produced is determined, and a portfolio of intellectual property objects is formed. The development of each digitalization innovation project begins with the formation of a portfolio of intellectual property objects intended for use or developed during the implementation of the innovation project.

One important driver of the transition to digital logistics is the need for flexibility to integrate with new systems to share information, synchronize activities, and collaborate across processes. Digital applications are based on a central repository of all logistics information. Stakeholders can view the information, add or change details. Logistics management controls the purchase, transportation, and storage of goods. The process begins with the origin of the product and ends with the consumer. Logistics management includes order fulfillment and integrates with other business functions. Evolving technology trends can be discussed in the context of four technology clusters, addressing

² It was formed by the student himself as a result of studying the existing economic literatures.

both the operation and maintenance of vehicles and the transport infrastructure, but also front-end customer service. Technologies within those clusters are reviewed with respect to their technical feasibility, the economic benefits they provide and the regulations and policies that need to be in place. The following conclusions have been reached based on the analysis of these clusters.

Technology and automation are often triggered by the safety and efficiency concerns of operations, and not always motivated by reducing labor costs. In particular, in emerging technologies requiring interconnected systems there is a strong emphasis on ensuring the safety and security of operations. However, in some transport modes, such as the road freight sector, labor costs are regarded as an important element in business cases related to autonomous and highly automated transport.

Automation is often used as an argument to respond to demographic challenges in some regions of the world. For instance, in Europe an ageing workforce has created a mismatch between labor supply and demand. In response, more automation has been introduced to the European rail industry to outweigh the consequences of a labor market mismatch, while maintaining high levels of safety. At the same time, capacity, punctuality, and efficiency have increased, while costs and emissions have been reduced – resulting in improved competitiveness of the railway transport.

Most notably, safety aspects are frequently promoted when automation and technology are discussed. Autonomous or remotely controlled devices reduce the exposure of transport workers to hazardous environments. Examples include exoskeletons that assist workers in lifting and moving heavy items; remote controlled cranes that can be operated from a safe distance; and airborne and underwater drones which make it possible to inspect and repair parts of ships and offshore structures that are difficult to reach by inspection workers.

Apart from the safety aspects, efficiency is an important factor for the introduction of technology and automation. Innovations that allow for higher levels of efficiency are given high priority due to increased competition across all transport modes.

Digitalization is the process of introducing digital components into systems and processes thereby enhancing or replacing physical components by electronic systems (e.g. steer-by-wire).

The term automation describes processes and systems i.e. mechanical devices or electronic devices, which are often computerized and that execute certain operations by a specific method without human control, but which are often supervised by humans. If the system has control functions that can use different options to solve selected classes of problems, the system is said to be autonomous (Rudest and Nor dahl, 2017).

Depending on the degree of labor that needs to be performed by human operators in collaboration with an autonomous system, the system is assigned a level of autonomy. Across industries, a range of taxonomies of levels of autonomy has been developed. For example, a taxonomy that has been broadly applied in the maritime industry was proposed by Lloyd's Register (2017) (see Table 1.A).³

Finally, unmanned vehicles are a special case where the operating crew is not on board the vehicle, and which is then either remotely controlled, or operated autonomously.

Table 2: The autonomy levels in transportation⁴

LEVEL OF AUTONOMY (AL)	DESCRIPTION
AL 0: Manual	No autonomous function. All action and decision-making performed manually (n.b. systems may have level of autonomy, with human in/on the loop.), i.e. human controls all actions.
AL 1: On-board decision support	All actions taken by a human operator, but decision support tool can present options or otherwise influence the actions chosen. Data is provided by systems on board.

³ Source: Automation, Technology and Employment – The Future of Work

World Maritime University. Lloyd's Register, LR Code for Unmanned Maritime Systems', Lloyd's Register, 2017

⁴ Transport 2040: Automation, Technology, Employment - The Future of Work. 2019, International Transport Workers' Federation (ITF), London, UK. ISBN: 978-91-984865-1-3 36-37 pages

AL 2: On & off-board decision support	All actions taken by a human operator, but decision support tool can present options or otherwise influence the actions chosen. Data may be provided by systems on or off-board.
AL 3: 'Active' human in the loop	Decisions and actions are performed with human supervision. Data may be provided by systems on or off-board.
AL 4: Human on the loop, operator/supervisory	Decisions and actions are performed autonomously with human supervision. High impact decisions are implemented in a way to give human operators the opportunity to intercede and over-ride.
AL 5: Fully autonomous	Rarely supervised operation where decisions are entirely made and actioned by the system.
AL 6: Fully autonomous	Unsupervised operation where decisions are entirely made and actioned by the system

3.2 Implementing Digital Transformation In Uzbekistan

Currently, logistics is one of the digital networks in both the world and in Uzbekistan, which is reflected in foreign sources studying logistics. Most of the new trends in logistics will not be possible without innovations in the development of digital technologies in the field of logistics. At the same time, the use of modern digital technologies in the field of logistics is a targeted factor in increasing the economic competitiveness of the country. Information-logistics systems are important to ensure well-coordinated logistics work, because the performance of the entire logistics system depends entirely on their work. In accordance with the Decree on approval of the Strategy "Digital Uzbekistan⁵ - 2030" and measures for its effective implementation [1], the active development of the digital economy in the country, modern information and communication in all sectors and industries, especially in transportation, logistics, public administration, education, health and agriculture Comprehensive measures are being taken to widely introduce technologies.

In addition, in order to further increase the effectiveness of ongoing reforms, to create conditions for the comprehensive and rapid development of society and the economy, to implement the priorities for modernization and liberalization of all spheres of life:

1. Develop a fundamental framework for increasing competitiveness through the digitization of the economy in the service sector.
2. Development of software that will allow digitizing the economy in the service sector.
3. Priorities have been identified in the service sector, such as the formation of a single electronic platform for digitization of the economy.

When it comes to modern platforms, the creation of the digital platform "Warehouses and Logistics Centers of Uzbekistan" by the Logistics Association of Uzbekistan with the support of the Ministry of Transport of the Republic of Uzbekistan in mid-2021 is a clear example of the fact that our country is at a new stage of development in this field. The purpose of creating the platform is to increase the volume of foreign trade operations, create favorable conditions for doing business, attract foreign investments to the construction of new and modern warehouses and logistics centers in Uzbekistan, and introduce modern information technologies in the field of transport and logistics. The main task of the digital platform is to meet the ever-increasing demand for the services of warehouses and logistics centers of Uzbekistan by national and foreign trade and investment companies. The digital platform "Warehouses and logistics centers of Uzbekistan" contains information about the location of warehouses and logistics centers in the territory of the republic. Through this platform, entrepreneurs of Uzbekistan and foreign countries can specialize in a warehouse or logistics center (agricultural products, food and non-food products, household appliances, pharmaceutical products, etc.) according to the nomenclature of goods, as well as closed and open can obtain free information on the availability of free space in the warehouse area, including cold storage for agricultural products and perishable goods. This platform serves the interests of the owners of warehouses and logistics centers and entrepreneurs who are looking for free space to place and store their products. At the same time, there is a special function "special offers", which involves the sale, rental and purchase of warehouses, warehouse equipment, loading and unloading equipment, as well as receiving applications for storage. This information platform meets the principles of "single window", in which the participants of transport and trade logistics can see and receive the necessary information and services related to the

⁵ Decree of the President of the Republic of Uzbekistan. On approval of the Strategy "Digital Uzbekistan - 2030" and measures for its effective implementation. PF-6079 05.10.2020.

storage of goods in one place in electronic form. This information resource is useful for production and trading companies, entrepreneurs (cargo owners) and transport companies (carriers), as well as companies and organizations that provide services related to cargo forwarding, insurance and customs clearance. The digital platform created in cooperation with experts of the Ministry of Transport serves to organize effective transport and warehouse services, create a competitive environment and favorable conditions for the activities of transport and logistics companies, as well as improve and develop the cargo transportation system. At the same time, this platform combines information on warehouses and logistics centers operating in Uzbekistan, their size and specialization, equipment and service level, compliance with international standards and generally recognized classifications. It also serves as an information base for analyzing the situation and development prospects of Uzbekistan's warehouse logistics, which, in turn, serves as a basis for the formation and development of development forecasts. The following norms are the basis for the creation of such platforms and their wide use in the activities of logistics enterprises in our country. Decree No. PF-4947 of the President of the Republic of Uzbekistan of February 7, 2017 on the Action Strategy for the further development of the Republic of Uzbekistan, February 25, 2019 "The ranking of the Republic of Uzbekistan in international ratings and indexes" to ensure the implementation of the tasks specified in paragraph 6 of the decision PQ-4210 "On measures to improve the position of Decree No. PF-5953 on the implementation of the strategy of action in five priority directions "in the year of the development of science, enlightenment and digital economy", as well as to further increase the effectiveness of the ongoing reforms, priority direction on creation of conditions for comprehensive and rapid development of society and economy, modernization of our country and liberalization of all spheres of life.

From the above, it can be concluded that transport significantly supports international economic relations and plays a key role in creating a world network of commodity exchange and in the transfer of capital between countries between several types of vehicles. Logistics chains need to be recognized to serve the flow of goods supporting intermodal transport methods and terminal effects in planned locations at very low cost. In this context, globalization plays an important role in the transport and logistics system and its actions are manifested in various parts of logistics processes. The results show that exports and imports of goods and services have increased in developed countries due to economic globalization than in developing countries. Without globalization, transport logistics systems cannot develop competitive features. Currently, logistics is one of the digital sectors both in the world and in Uzbekistan, and this is reflected in foreign sources studying logistics. Most of the new trends in the field of logistics will not be possible without innovations in the development of digital technologies in the field of logistics. At the same time, the use of modern digital technologies in the field of logistics is a target factor for increasing the economic competitiveness of our country. Information-logistics systems are important for ensuring well-coordinated logistics operations, because the operation of the entire logistics system depends entirely on their work.

The field of logistics and transportation is experiencing significant changes caused by the digitalization. Technologies of stream processes management that involve a high degree of human physical labor which do not allow interactive monitoring of operations and quality control of their execution, and paperwork flow, become inefficient and outdated already. Cutting -edge Application of Information and communication technology increasingly determines the level of competitiveness of logistics companies. The degree of digitalization largely determines the speed, accuracy of operations, and provides opportunities to develop adaptability and flexibility of supply chain. This leads to new perspectives for companies and their customers: risk management based on rating and user community engagement, joint developments, forms of self-service and complex outsourcing. Smart logistics becomes a reliable basis for the development of international business supporting the optimization of the involvement of world resources. These changes also help to enhance the role of logistics in our country and trigger us to try hard to implement digitalization in this sector deeply among the whole area of Uzbekistan. The field of logistics and transport is undergoing significant changes today due to digitalization. The degree of digitalization largely determines the speed and accuracy of operations and provides opportunities for developing the flexibility and adaptability of the supply chain. This leads to new perspectives for companies and their customers: rating and user community participation, joint developments, self-service forms and risk management based on complex outsourcing. These changes will also help increase the role of logistics in the US and facilitate the deep implementation of digitization in this sector throughout the Americas.

Taking into account the above ideas and indicators, we can say that the logistics industry in the United States is very important and is predicted to grow with the help of digital ideas in the next few decades. That is, new opportunities, new digital technologies in logistics, new methods and most importantly, countless jobs will appear. Based on the data obtained by analyzing the digital development in the American transport and logistics industry, it is appropriate to make the following suggestions. In the creation of innovative transport-logistics systems in our country, it is proposed to implement step-by-step recommendations on the process of forming innovative transport-logistics systems on the

basis of a single digital platform. The stages are considered by the authors as a basis for creating an innovative transport-logistics system based on modern digital technologies.

So, if we want to place our country among the developed countries, first of all, we can solve the problems and achieve the set goals only by developing each sector separately. In general, the following problems related to the introduction of digitization in the transport sector in our country should be noted:

- The fact that the main passenger and freight locomotives in our republic are not digitized in almost all regions.
- digitization of the public transport system serving the population into a single database and lack of 3D maps covering all areas.
- lack of unified information integration between organizations and customers engaged in passenger and cargo transportation.
- the absence of a national system of transport services and their almost complete absence of electronic payment systems.
- the low level of establishing interregional modern logistics warehouses and providing them with modern equipment and technologies.
- non-availability of online monitoring database of inter-provincial cargo transportation.
- Railway and air transport across the regions is not organized at a high level;
- underdevelopment of the national logistics market.

In our opinion, the following works should be carried out in connection with the digitization of the transport and logistics system of our country:

1. creation of a single access point for digital platforms in the supply chain in the field of innovative transport and logistics cooperation.
2. support the effective exchange of transport and logistics information between supply chain participants.
3. common standards required for joint innovative research in the field of transport and logistics, which allow participants to use external distributed systems for storing and processing the necessary information.
4. integration with external information systems, including foreign systems, to identify supply chain participants and ensure their mutual cooperation.
5. to ensure the management of mutual settlements on transport-logistics operations, joint use of the infrastructure in the study of the field of transport-logistics among the participants of the digital platform.
6. implementation of technological interfaces for interaction with digital platforms of supply chain participants and leading logistics centers.
7. Increasing the qualifications of employees employed in the field of logistics and transport as soon as possible.

If we look at developed foreign countries, we can see that the above-mentioned processes were fully implemented several decades ago. In particular, the transport sector is fully automated in the USA, Germany, France, England, Turkey, Singapore, UAE, China, Malaysia, Korea, Japan and other countries. As a result, we can see that the transport sector has been developing in every way for years, and processes are being implemented through digital technologies. Nowadays, we can see these countries moving to a new stage using artificial intelligence based on the concept of "Smart City".

4. Conclusion

It should be noted that there are many problems, such as the lack of a single digital platform in the country's road transport, railway, and air transport, which creates the need to accelerate digitalization reform. In the current period and soon, the introduction of promising developments such as digital infrastructure and intermodal services in the transport system of our country will increase the volume of passenger and cargo transportation and have a significant impact on economic stability. The reason is that the convenient geographical and transit location of our country serves as the main foundation for the development of this industry. Considering that we are deprived of waterways and transport is only by land, the importance of rail and road and air transport in our country increases by itself and we need to solve the problems that arise in time.

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