Digital transformation challenges of logistics in Bulgaria

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Abstract. This paper investigates the issues of digital transformation in Bulgaria. It presents the major contemporary technologies, used in digitalization and digital transformation and then presents a methodology that evaluates the degree of digital transformation in the area of logistics. Determining the level of basic digitalization of Bulgarian logistics companies is done by developing a methodological framework that covers the main classification of information systems in the area. The indicators covered are in two groups - intraorganizational and interorganisational digitalization. The state of digital transformation is analysed, reviewing small, medium and large enterprises, following a survey within each company. The results show a big potential for the process of digital transformation in Bulgaria in logistics.

1. Introduction
At present, business organizations are increasingly seeking to digitalize their operations, using computers, computer networks, mobile technologies and other new digital approaches like digital identification with RFID and NFC. This is the way forward, allowing a company to stay at the top of the competition pyramid. Such an approach is followed basically by each and every kind of business but one of the most dynamic, with fast implications regarding results is in the area of logistics and supply chain management. There are several opportunities in those subjects, related to material flow management, which in turn leads to cost reduction and a higher level of customer service. The use of digital technologies is crucial, as the material flow is driven by information flow and the result largely depends on the quality of the information and its processing in digital form. Although the significance of the management of the organization has always been high, nowadays the opportunities, that IT technologies provide to that management are assessed as paramount. Computer technologies have provided the world with unprecedented opportunities to collect, process, store and exchange data and information. It is now possible to exchange massive amounts of digital data between all parts of the world in real time. As a result, several preconditions have been created for efficient movement of material flows in the supply chain.

2. Digital transformation – approaches and technologies
Digital transformation solutions are already available, and the only limitation is finding the right way to use them in almost every part of business, including logistics. It is no coincidence that we are currently witnessing the existence of previously unthinkable organizational associations, which are defined as virtual companies that operate entirely in a virtual environment. They do not have offices and customer
centers; all their assets are intangible. Such organizations have specific know-how and seek to manage information and processes in cyberspace in the most efficient way. The result of such information management is the improvement of the efficiency of the real material flows of products and services to the customers in the supply chain. Below are presented the major technologies for digital transformation.

2.1. Cloud computing
This technology is older than a decade, which in IT terms may sound much, but the fact is that it has just matured and started being used by individual users, organizations and various companies. The cloud services allow the use of computer resources like Central Processors, memory, and application programs. CPUs execute various programs, and one does not have to worry when and how to get the newer and faster processor – it is in the cloud. Memory is the other critical asset of computing – with the cloud, the user does not have to worry whether for certain tasks the memory is enough or not. Expensive programs may be used with the cloud and not purchased by the users. All these became a flexible and important part of modern IT life for both companies and private users. Clouds can be private (i.e. owned by a certain company or organization) or public (with access by any organization or individual). The most popular cloud at present is Amazon Web Services (AWS), but Microsoft Azure and Google Cloud Platform have also their prominent position in the league of clouds. This technology is very important for logistics, as resource sharing can achieve unity and coherence. Using such technologies, significant improvement of factors traceability and support in real time are achieved, while having high accuracy and flexibility at the same time [1]. Smaller (or even bigger) logistics companies can avoid purchasing and maintaining IT infrastructure, and its operation with its variety and diversity of services. Clouds are easy to deploy and can effectively support digital transformation in logistics, synchronising and unifying the resources and users.

2.2. Internet of Things
Internet of Things (IoT) was for almost a decade a new and hot technology for all IT giants and researchers. Not surprisingly, companies of the rank of Google, Amazon, Microsoft, Intel, IBM, Oracle, Cisco, AT&T, Huawei, Alibaba, JD.com, etc. have made IoT a priority in their activities and have developed IoT platforms. IoT is closely related to “things” getting “smart” – it is common nowadays to have a smart TV, smartwatch, smart industry, smart logistics, smart cars, smart homes. People even tend to forget that there were non-smarts object and items like those until recently. The real “smart” part of IoT is that with the embedded sensors and RFIDs, objects and processes can collect data from the environment or the state of the “smart” object and monitor the data, or collect and send it for the users. IoT is very much suited to be applied in logistics, as it can facilitate production, transport, inventory, materials handling and warehousing. A popular opinion is that the development of IoT has taken logistics to a new stage [2].

2.3. Big Data
One of the effects and outcomes of IoT (but not related to it alone) is the emergence of Big Data. This relatively new hot term relates to all methods and approaches, used to fetch process and analyse data, which are rather big and too complex to be processed in traditional ways. With all new sources and formats, data now appear with so many unknown dependencies and relations, problems and errors. All this has an unmatched potential for the discovery of new materials, drugs or innovations. The work related to Big Data goes concerning data collection, storage, search, sharing, transfer, etc. Logistics with the abovementioned production, transport, inventory, materials handling and warehousing applied in real time or in batch processing can be one of the great beneficiaries of Big Data areas of application. Being a vital part of any business, logistics and supply chain are further perfected by Big Data [3]. Big Data and IoT can increase driver safety, reduce operating costs, and improve the environmental impact of vehicles [4].

2.4. Artificial Intelligence
The next logical step after creating and collecting data is to analyse it and to draw some benefit for the end-users. And logically, the end-user often being human (not only), as such he/she cannot read, grasp,
and process a huge amount of data/information. Here comes the Artificial Intelligence (AI). It pretends to have human-like intellect, the main feature being the ability to learn. Learning from others (experience) and available (like humans do) brings closer objectives, that humans were not able to achieve until now, due to their limited resources on storing data and processing it. At the same time computers were not able to do those jobs, as they were not “capable” of learning but only executing programs, written by people. Now that predefined programs were modified so that they can learn and solve tasks, which cannot be solved without that learning step. AI takes human thinking and reasoning to the processing speed of a computer and its capacity for storing data (bigger than the Library of Congress). AI and associated technologies like Predictive Analysis, Strategic Optimization, Robotics and Autonomous vehicles are used to revolutionize logistics, supply chain and transportation industry [5].

2.5. Virtual Reality, Augmented Reality and blockchain
Next, come technologies, related so far more with computer games and cultural sites, where a past or future are generated - the two realities: Virtual Reality (VR) and Augmented Reality (AR). Both are interactive technologies, creating non-existing or mixing the existing with the non-existing world. Both technologies use sensors and data and so far, are linked to video and audio experience to enter a world of application, which can also be logistics. VR is popular in demos and education and there are reports that this technology can be used in demonstrating and teaching of logistics equipment applications [6]. On the other hand, introducing AR supports and eases the process of receiving, storage, sorting, transportation, inventory and planning [7]. Next comes the blockchain, linked to its “creator” - the bitcoin but also often considered as the survivor of the bitcoin, after it is gone for good. The concept of the blockchain is an ever-growing list of records, called blocks, linked to each other (as a chain) by cryptography methods. Many organizations have proposed the introduction, or have already introduced blockchain in their fields of operations, including logistics. Slowly but steadily logistics and supply chain management communities have realized how strongly a blockchain can affect those sectors [8]. At present, the problem of blockchain, in terms of its application as a progressive method of digital logistics, is currently not widespread in the construction of information logistics systems [9].

3. Digitalization practices in logistics
Discussing digitalization practices and IT systems in logistics, one can look at classification approaches. Such can be done based on the material flows in the supply chain:
- Supplier relationship management (SRM);
- Manufacturing execution systems (MES);
- Customer relationship management (CRM).

Another classification is according to different logistics activities, the main groups being:
- Transport management systems (TMS);
- Warehousing management system (WMS).

In the supply chain value results from the synergy among firms comprising the supply chain with respect to five critical flows: information, product, service, financial, and knowledge [10]. The way in which entities in a supply chain become connected is through shared information [11]. As a result, there is a popular conclusion that material flows are managed by the information. That’s why data and information are so important for logistics. An important notice is the tendency for massive information sharing not only in the organization but in the supply chain. Modern information systems stay on this fundamental but to achieve this in a more efficient way, a variety of modern information technologies are also used – IoT, cloud computing, AI, VR, AR, blockchain, e-commerce practices, corporate websites. Here we can mention that now the e-commerce platforms are more than a software solution for presentation of the company products in the web space and they potential for transformation into small-sized ERP [12].

The digitalization of the logistics can be looked at in two directions – digitalization within the organization and digitalization in the supply chain. The common approach of inter and intra
organizational focus could be used for the research of the impact of strategy and logistics on performance [13].

Digitalization within an organization is the process of converting the traditional activities in it to activities, done or supported by computers, computer networks, software tools of any kind and mobile communications. Digitalization within an organization includes not only the introduction of computers, networks and software within the organization but also digitalization of material flows by RFIDs, digitalization of the control and feedback of those goods/things by the sensor or mobile networks, automatic capturing of data of moving objects/things by AIDC (Automatic identification and data capture). A very important digital tool within an organization is an ERP (Enterprise resource planning) system.

Digitalization in the supply chain is the digitalization of all its stages (of all organizations and activities) and digitalization of the interaction between the stages. In addition to those two, there is an opportunity for an analysis of the entire supply chain by analytical programs (business analytics), including artificial intelligence tools. AIDS, Auto-ID (identification for vehicles), ADC (Automatic Data Capture), GPS systems, etc. are also used in the supply chain digitalization. Cloud computing is the other major, and already mature digital technology integrating and support the complexity of the supply chain management. As mentioned above, blockchain can provide the needed level of security and authentication in the entire chain.

There are several good examples of how digital transformation can be beneficial and accelerating the work for different organizations.

One good illustration is the acceleration of the deliveries in the transport/logistics area. At the end of 2017, Amazon launched its application for trucking, called Relay, designed to make trips to Amazon warehouses faster and more effective. Drivers enter cargo information into the app before they arrive to the destination point. Once enter cargo information in the application, they obtain a QR code, which is used at the entry gate. In such a way a pre-checking in is performed, accelerating the process. There appears better visibility in regard to the current location of the deliveries and the warehouse can better prepare for the arrivals. The entire process of accepting, checking and processing the deliveries is optimized and human errors can be avoided. Amongst the biggest challenges in the logistics/transport sector, where hundreds of millions of dollars are invested, are the trust factor and scalability.

4. Methodology
We have conducted several studies on the state and current development of digitalization in Logistics in Bulgaria. The results of the current research are based on a survey conducted among the main participants in the logistics processes in the country. The main purpose of the research is to assess the key problems of the digital transformation in Bulgarian logistics companies. The optimal scope of the research is too wide and thus, selected research areas have been covered. Likert scale questions are mainly used in the survey (1 - Strongly disagree, 2 - Somewhat disagree, 3 - Neither agree nor disagree, 4 - Somewhat agree, 5 - Strongly agree). The present paper looks at the following main topics:

- Intraorganizational digitalization:
  - Data and information management/exchange in the organization;
  - Digitalisation of the transport management;
  - Digitalisation of the warehousing management.

- Interorganisational digitalisation:
  - CRM;
  - SRM;
  - ERP.

5. The state of digital transformation of logistics in Bulgaria
The number of respondents involved in the analysis is approximately 150, with 54% small businesses (up to 49 employees), 27% medium (from 50 to 249), and 19% large enterprises (over 250 employees). According to the ownership, the share of foreign companies, operating in the territory of the country is almost 20%, with the rest, 80%, being entirely Bulgarian companies.
For the first group of indicators (Intraorganizational digitalization - Data and information management/exchange in the organization) we can mention the following summarized results as it is represented in Figure 1. According to the data, the departments dealing with finance have the highest score, which is expected. They are followed by the departments performing the logistics functions. However, the average scores gravitate around 3.5, which is unsatisfactory.

Communication with partners in the supply chain is also very indicative of the overall degree of digitalization of the business. The question is a multi-choice type - allows several answers. The summary of data for communication with suppliers and customers is shown in Figure 2.

Personal meetings are still favored with their advantages and disadvantages. The negative moments are associated with high costs, waste of time, difficulty to build a relationship, human error, etc. The positive moments include better expression and communication, using body language, more concentration than in an on-line environment, lack of technical problems, etc. The differences that are observed are related to the fact that when communicating with customers, company representatives more often resort to telephone and e-mail, while when communicating with their suppliers, web platforms and automated systems are more commonly used.
Figure 3 presents the degree of implementation of individual information systems and technologies in the organization, as well as future intentions in the next 3 years. These data largely reflect the level of digitalization and several conclusions can be drawn. First, the overall degree of digitalization is very low and unsatisfactory, with scores gravitating around the neutral average of 3 (1 - definitely not implemented - 5 definitely implemented).

Second, no significant conclusions can be drawn about the difference in implementation because the discrepancy in the estimates is very low. Only web systems stand out due to their popularity and are expected to have a higher degree of implementation. In the opposite direction are RFID systems, which worldwide still cannot replace barcodes. The third conclusion is related to the future intentions of the organizations. There is clear intention and planning for significant steps in the direction of digitalization, while discussions about the reasons for this remain open.

**Intraorganizational digitalization - digitalization of transport management.** Transport is a major logistics activity, which is also associated with significant costs. Therefore, its characteristics are very indicative of the entire logistics system, as well as the organization as a whole. According to the survey data, Bulgarian organizations have a weak application of software systems to support the management of transport processes. However, it can be noted that such systems are mainly used to generate reports and maintain a database of transport tasks, as it is shown in Figure 4. The other usages are very little affected, which shows a low degree of digitalization.
The statements for the transport management software (TMS) reveal several specific points in the systems used. According to the data in Table 1, TMS are far from modern views on digitalization. Most of the assessments are lower than 3.0, which is a serious challenge for future development.

Table 1. To what degree are valid the following statements for the TMS of your company?

| Statements for the transport management of a company                                                                 | Assessment |
|---------------------------------------------------------------------------------------------------------------------|------------|
| This software system is the main software product in the company                                                    | 3.3        |
| Integrates with other software systems in the organization                                                          | 3.0        |
| Our customers have online access to this information system                                                        | 2.7        |
| It can function with low human intervention                                                                       | 2.6        |
| Automated route determination without a dispatcher                                                                  | 2.6        |
| Automatically monitors the execution of the route and sends a signal in case of deviation                           | 2.8        |
| Tracks traffic in real time (for example on Google) and independently makes suggestions for changing the route     | 2.8        |
| The routes are loaded automatically in the vehicle navigation systems                                             | 3.0        |
| It uses cloud computing - it is accessible from anywhere with internet available                                     | 3.2        |
| It can operate via mobile devices                                                                                  | 2.8        |
| It can operate without telephone calls to drivers                                                                   | 3.3        |
| Uses GPS technology                                                                                                | 2.7        |
| Uses Google Maps or other online geographic information systems                                                   | 3.2        |
| Integrates with in-vehicle navigation systems                                                                      | 3.1        |
| Uses sensors to monitor the condition of the load                                                                   | 2.6        |
| Uses applications such as Viber, Whatsapp and others for communication.                                             | 2.7        |
| Uses Electronic Data Interchange (EDI) for communication                                                            | 2.8        |
| Facilitates daily activities                                                                                       | 3.7        |
| Works efficiently and smoothly                                                                                    | 3.5        |
| It needs improvement                                                                                              | 3.3        |
| Reducing human intervention                                                                                       | 3.0        |
| Easily prepares reports, reduces paperwork                                                                           | 3.5        |
Only a slight discrepancy in the positive assessment can be traced in the direction of mobile devices, cloud technologies and GPS systems. Unfortunately, the claims of automation, reduced communication, routing, etc. receive very low marks. It is no coincidence that the statement "It needs improvement" is relatively high.

**Intraorganizational digitalization - Digitalisation of warehousing management.** Warehousing is another major logistics activity and the foundations of its digitalization is indicative for the organization's whole performance. In the analysis of the data, it should be noted that there are significant discrepancies in the functionalities of the warehouse software. Another thing is that the respondents do not make a clear distinction between the different types of warehousing software. From the data in Figure 5 one can see that the full capacity of the storage systems is not used. The high averages scores of invoicing and receiving orders reveal that most of the warehousing systems are related to the accounting systems in the organization, or they are part of them. Important processes like picking, demand forecasting, synchronization with the transport management systems are not enough covered by these systems that reflex in the overall performance.

![Figure 5. Answers to the question “To what degree do you use the software of your company for warehouse management?”](image)

The results in Table 2 allow us to analyze in-depth the digitalization of the warehousing. Unfortunately, the previous conclusions come to light again, it is clear that a low level of utilization of the possibility of modern information systems and technologies exists. The potential for automation and robotics is extremely low, which is not adequate for today's competitive conditions and requires urgent measures in this direction. There are other concerns, namely the low ratings for Electronic Data Interchange (EDI) for communication, reducing human work, functioning with low human intervention, etc. There is also a low score for the need for improvement - only 3.4. This shows that there is significant potential for education on this topic. The level of knowledge on these problems is rather low.

**Interorganisational digitalisation – CRM.** Customer’s experience is of critical importance for every business. Keeping the customers satisfied is one of the main goals on the path of retaining them for a long time. At the same time, the dynamics of our time makes customers very active and demanding. A CRM system is important not only for improving the relationship with customers but also for the increase of profit and reduction of costs for the organization. Figure 6 presents the degree of using CRM software for various aspects of the organization of business in relationships with customers. The most popular aspects of CRM are receiving orders, keeping customer’s database, communicating with customers and managing the status of orders. The least used is sending congratulation and reminder message. Overall, there is a lot of room for improvement, so that customers get better services and companies get better data for analytics and optimization of their relationship with their clients.
Table 2. To what degree are valid the following statements for the warehouse management software?

| Statements for the warehouse management software of a company | Assessment |
|---------------------------------------------------------------|------------|
| It fully covers the needs of the company for logistics software | 3.3        |
| This software system is the main software product in the company | 3.4        |
| It is linked to the company’s website                          | 2.8        |
| Provides direct connection with the software systems of our customers and suppliers | 2.5        |
| It can function with low human intervention                   | 2.6        |
| Controls robotic systems for movement of goods in the warehouse | 2.3        |
| Uses robotic order preparation systems                        | 2.3        |
| Automatically distributes goods by location in the warehouse   | 2.4        |
| Automated synchronizes processes with vehicles                 | 2.6        |
| It uses cloud computing - it is accessible from anywhere with internet available | 2.8        |
| It can operate via mobile devices                             | 2.9        |
| Used for barcodes                                             | 3.4        |
| Uses radio frequency identification                            | 2.4        |
| Uses Electronic Data Interchange (EDI) for communication       | 2.8        |
| Uses pick by light / pick by voice                            | 2.2        |
| Facilitates daily activities                                  | 3.7        |
| Works efficiently and smoothly                                | 3.6        |
| It needs improvement                                          | 3.4        |
| Reducing human intervention                                   | 3.0        |
| Easily prepares reports, reduces paperwork                    | 3.6        |

Table 3 reveals that CRM systems are not fully integrated with other digital social and commercial platforms like Facebook, eBay, Olx or with communication applications like Viber, WhasApps. Automatic text messages are also not well placed in the integrated view of a CRM. Neither it is well placed to receive automatically orders, to automatically distribute customer tasks. The most commonly used tools are those, that are for a relatively long time – emails, preparing e-reports and reducing paperwork. There is a relatively good degree of integration with sales, logistics and accounting systems, most likely due to ERP software. It is evident, that with further software integration, the digital
transformation for CRM can help companies achieve better results and a higher degree of customer satisfaction. In this respect, the wider use of cloud systems in logistics can also improve the level of digitalization in logistics.

**Table 3.** To what degree are valid the following statements for the CRM software of your company?

| Statements for the CRM software of a company | Assessment |
|-----------------------------------------------|------------|
| Our system is part of a larger company system | 2.9        |
| Works independently of other systems         | 3.5        |
| Our system is fully integrated with sales systems | 3.6        |
| Our system is fully integrated with logistics systems | 3.8        |
| Our system is fully integrated with accounting systems | 3.8        |
| It is linked to the company’s website        | 3.4        |
| It is integrated with social networks such as Facebook | 2.7        |
| It is integrated with platforms such as eBay, olx or others | 1.9        |
| Provides direct connection with the software systems of our customers | 2.8        |
| It can function with low human intervention  | 2.7        |
| Automatically accepts orders                 | 2.7        |
| Automatically accepts complaints             | 2.4        |
| Automatically distributes customer service tasks | 2.6        |
| It uses cloud computing - it is accessible from anywhere with internet available | 3.1        |
| It can operate via mobile devices           | 3.5        |
| Used for communication e-mails              | 3.9        |
| Uses applications such as Viber, WhatsApp and others for communication. | 2.7        |
| Used for communication SMS                  | 2.9        |
| Uses Electronic Data Interchange (EDI) for communication | 3.4        |
| Facilitates daily activities                | 4.1        |
| Works efficiently and smoothly              | 3.8        |
| It needs improvement                        | 3.3        |
| Reducing human intervention                 | 3.1        |
| Easily prepares reports, reduces paperwork  | 3.9        |

**Interorganisational digitalisation – SRM.** Managing the relationship with suppliers is also a very important aspect of every business, and in logistics in particular. Figure 7 shows that the digitalization in that kind of relations is present at a larger scale at activities like work with documents, keeping a supplier’s database and communicating with warehouses, suppliers and couriers. Least used are negotiations and on-line auctions. Overall, there is much room for improvement even for the most traditional aspects. The digital transformation with suppliers can be improved significantly and this will help and increase the capabilities and dynamics concerning using alternative suppliers, thus – facilitate the business policy and practice of a logistics company.

Table 4 also shows an unsatisfactory picture in regard to the management with suppliers. There is not even one average score above 4. Integration with auction platforms, automatic order placement and notification when a problem occurs have rather low score. Cloud computing is also at the bottom of used digital technologies. It looks as digitalization of SRM has one of the biggest opportunities for improvement, which in turn will improve customer satisfaction and the overall health and profit for the company.
Table 4. To what degree are valid the following statements for the SRM software of your company?

| Statements for the SRM software of a company | Assessment |
|---------------------------------------------|------------|
| Our system is part of a larger company system | 3.0        |
| Works independently of other systems        | 3.5        |
| Our system is fully integrated with sales systems | 3.5        |
| Our system is fully integrated with logistics systems | 3.6        |
| Our system is fully integrated with accounting systems | 3.7        |
| It is linked to the company’s website        | 3.0        |
| It is integrated with electronic auction platforms | 2.2        |
| Provides direct connection with the software systems of our suppliers | 2.8        |
| It can function with low human intervention  | 2.7        |
| Automatically places orders                  | 2.4        |
| Automatically notifies suppliers if there are problems with delivery | 2.3        |
| Automatically distributes delivery tasks     | 2.4        |
| It uses cloud computing - it is accessible from anywhere with internet available | 2.8        |
| It can operate via mobile devices           | 3.3        |
| Used for communication e-mails              | 3.5        |
| Uses applications such as Viber, WhatsApp and others for communication. | 2.5        |
| Used for communication SMS                  | 2.6        |
| Uses Electronic Data Interchange (EDI) for communication | 3.1        |
| Facilitates daily activities                | 3.8        |
| Works efficiently and smoothly              | 3.7        |
| It needs improvement                        | 3.4        |
| Reducing human intervention in customer service | 3.0        |
| Easily prepares reports, reduces paperwork  | 3.6        |

Interorganisational digitalisation – ERP. Planning the resources of a company by using ERP software is considered to be vital for any business. Such multifunctional business software consists of integrated software modules, that support the main processes in an organization. ERP collects, stores and manages data from all kinds of activities – from the warehouse process management to human resources. Figure
8 presents a relatively unsatisfactory picture of the use of ERP software and it resembles the state of use of SRM software, as discussed above. In short – ERP still waits to be more massively employed and so – help improve and integrate the majority of business activities within an organization. Of course, one should take into account, that the cost of expensive software is not always affordable for small or medium enterprises.

![Figure 8.](image)

Table 5 also resembles the state of using and employing ERP software as it was for SRM – no score at, or above 4, several at or below 3. Even links to the company’s website are at an unsatisfactory level. The highest score goes for reducing paperwork and facilitating report preparation and daily activities. Even the low score of “It needs improvement” shows that there is a serious misunderstanding of the benefits of an ERP system, or there is a high degree of unawareness on the topic.

**Table 5.** To what degree are valid the following statements for the ERP software of your company?

| Statements for the ERP software of a company | Assessment |
|---------------------------------------------|------------|
| It fully covers the needs of the company for logistics software | 3.5 |
| This software system is the main software product in the company | 3.6 |
| It is linked to the company’s website | 3.0 |
| It is integrated with social networks and e-commerce platforms | 2.5 |
| Provides direct connection without human intervention with the software systems of our customers and suppliers | 2.6 |
| It can function with low human intervention | 2.5 |
| Automatically distributes tasks between departments | 2.8 |
| It uses cloud computing - it is accessible from anywhere with internet available | 2.8 |
| It can operate via mobile devices | 3.2 |
| Used for communication e-mails | 3.4 |
| Uses applications such as Viber, WhatsApp and others for communication. | 2.7 |
| Uses Electronic Data Interchange (EDI) for communication | 3.1 |
| Facilitates daily activities | 3.8 |
| Works efficiently and smoothly | 3.6 |
| It needs improvement | 3.4 |
| Reducing human intervention in customer service | 3.1 |
| Easily prepares reports, reduces paperwork | 3.9 |
6. Conclusions
The paper has reviewed the modern technologies for digital transformation and their application in the field of logistics. We have looked at topics like “How digitalized is a Bulgarian enterprise today?”, “What tools and technologies are used in Bulgarian companies in the field of logistics today?”. We have conducted a number of surveys among the main participants in the logistics processes in Bulgaria. The questions concern the process of digitalization within an organization and digitalization in the supply chain.

Our work concludes that there is a big potential for the process of digital transformation in Bulgaria. We can also see that there is a huge need for educational activities on modern IT paradigms like IoT, digital devices, technologies, and approaches for digital transformation. This is valid not only for the area of logistics and supply chain but also in most other fields of business, as one of the reasons for the absence of their implementation is the lack of understanding of the benefits of those technologies.

Some enterprises will describe how their current business model might become more digitalized but essentially remains the same, while others will describe how they will pursue new digital business models to add benefits to their existing portfolio. A digital business transformation can pursue both of these ends. That is why this research presents two complementary KPI frameworks that answer questions, that senior executive will have to consider the digital business transformation.

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