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NS global economics

ECONOMICS
Innovative and Economics Research Journal
Volume 11, No. 1, 2023

www.economicsrs.com

CHALLENGES IN INTRODUCING INNOVATIONS IN THE VETERINARY SECTOR IN BULGARIA

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Received 15. 01. 2023. | Sent to review 25. 01. 2023. | Accepted 29. 05. 2023.

Original Article

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JEL Classification:
O33; J11

Doi: 10.2478/eoik-2023-0017

UDK: 636.09:619]:005.96(497.2)

ABSTRACT

The digital transformation enters all spheres of public currently. At the same time, it does not take place at the same pace and scale everywhere. Bulgaria delays behind the most European countries in terms of the levels of the Digital Technology Penetration Index (DESI). In the presented research, the reasons for the delaying of digitization are sought, especially in the veterinary sector. In this regard, the subject of the present work is the introduction of special digital technologies to help the veterinary doctors. The aim is to reveal the reasons for the delay and to identify recommendations for a more successful introduction of modern software products and platforms in the veterinary sector. An online survey was conducted among 211 veterinarians of different professional categories and veterinary students, which revealed the main problems before the introduction of innovation and digitalization, taking into account that one of them is the aging of the veterinarians employed in it. The recommendations are made to increase their computer skills and digital competence through training, to emphasize the possibilities of digital innovation in the education of veterinary students, to develop special software products to assist veterinary professionals and the benefits for the veterinary sector are outlined from the introduction of digital innovations.

Keywords: *digitalization, veterinary sector, demography*

1. INTRODUCTION

There is no society, political and economic system, culture that is viable without the changes imposed by time. The changes are the source of renewal. This truth applies with the greatest force to the free political system, the free society, the free economy, which are part of the world globalization. The globalization as a new era in the modern world development reflects the need to form and define a new system of interaction and communication in a free human society. It is also defined as a new stage in human civilization, based on the new revolutionary system of knowledge, innovative technologies and technical achievements as well as the incredibly fast and changing pattern of society such as economy, culture and relations between the people (Ivanov I., 2023).

According to the report of the Ministry of Transport and Communications of the Republic of Bulgaria (Ministry of Transport and Communications , 2023), the digital transformation is a necessary process of technological development in Bulgaria, that creates conditions for innovation and business growth, increasing the efficiency of the workforce, a competitive digital economy and a high standard of citizens.

The development of the digital technologies and their entry into all spheres of the economic and

social life necessitates a rethinking of the approach to using their exceptional potential to increase the competitiveness of the Bulgarian economy, the increasing the demand, the supply and the efficiency of public services and successfully overcome the main social challenges in the period until 2030. The digital transformation is a process characterized by the wide implementation and combination of digital technologies in all spheres of social and economic life. The accelerated digital transformation is a prerequisite for the expected development of industrial production, for economic growth and an increase in income. The development of this process requires adequate and timely measures to increase the knowledge and skills of citizens, to acquire new skills and qualifications and to create a culture of all professional life learning that responds to the increasingly dynamic nature of the labour market.

The general movements towards digital economy were first discussed in 1998 in Ottawa (Canada), at the conference on electronic commerce, organized by the Organisation for Economic Co-operation and Development, when the global electronic commerce development plan was adopted and the importance of consumer and privacy protection oriented regulations was stressed (Mašić B., Vladušić L. , & Nešić S., 2018). Mastilo and Mićić (Mićić L. & Mastilo Z., 2017) define the digital workplace transformation as "a multi-step process of transition from traditional workplace, usually considered as a physically limited space and set of correlated tasks, to digital workplace, which is more flexible regarding place and time of work, and supported through adequate strategic and technological background".

The digital transformation, together with the European Green Deal, is a key priority at European level. Unfortunately, Bulgaria is in the penultimate place in this process compared to the other member states of the European Union. Furthermore, there is a significant delay behind the European average levels of digital connectivity, the use of digital skills online, the digitalization of businesses and digital public services. This is a challenge that is particularly clearly manifested in the agricultural sector and in particular in the veterinary sector in Bulgaria, where the demographic problems related to the aging of working veterinarians in this very important sector are most clearly observed.

From the economic point of view, we can say that the veterinary profession plays an outmost role in the agriculture as a part of the world economy (Dalling Th., 2015). The agricultural sector occupies an important place in the economic live in the most countries and the maintenance of the livestock of different kinds is essential parts of the developing the country agricultural policy. He stated also that it could be considered, that in the well developed countries, that veterinarians are concerned with, and their services used almost not exclusively for the treatment of the animals, but as guarantors for the control of spread of very economically important animal diseases, thus to facilitate the world trade and the economy. As regards the international trade the veterinary services provide the assurance of compliance with the conditions and measures necessary to minimize potential risks associated with traded commodities to human or animal life or health in importing countries. The veterinarian from the veterinary services of exporting and importing countries are partners in achieving this (WOAH, Required competencies of Veterinary Services in the context of the international trade Opportunities and challenges, 2023).

All this shows that the state of play with the veterinary sector in each country is of outmost importance for the development of animal husbandry, as a source of a raw material for a number of other very important industries. Effective countermeasures against the risk factors that can lead to economic crises caused by the occurrence of economically very important animal epidemics depend on it.

In Bulgaria, 7% of all scientific research costs are allocated to the development of agricultural and veterinary sciences. The implementation of scientific results in veterinary practice largely depends on the professional training of veterinary specialists and their skills to implement innovations in the sector. One of the obstacles to this is the aging of the workforce in the veterinary sector in Bulgaria.

2. METHODS

For the preparation of this work, a content analysis of documents from the European Commission, the European Food Safety Authority (EFSA), the World Organization for Animal Health (OIE), national and European legislation, the experience of other countries and expert opinions were studied as well as scientific materials and articles by other authors was made.
In order to study the attitudes of veterinarians working in the veterinary sector and the veterinary students on the introduction of innovation and digitalization and to see how these attitudes correspond with their age, a survey was conducted among 211 veterinarians and students in Bulgaria in March 2023. The survey was distributed online via Google Forms to social platforms and professional groups, and on paper to veterinary students. Completed anonymous surveys were returned to the authors for processing and summarization.
The questionnaire included the following 6 questions:

1. How do you rate your personal competence regarding the use of digital products and platforms?
2. Are you familiar with the World Organization for Animal Health Platform for the Management of Animal Disease Data Using an Information System (OIE-WAHIS)?
3. Are you familiar with the Animal Disease Information System (ADIS) platform for registering and documenting the development of the situation of important infectious animal diseases in the EU?
4. Please mark one of the listed benefits of the digitalization for the veterinary sector that you consider the most important
5. What difficulties, in your opinion, hinder the introduction of innovations related to the digitalization of the veterinary sector?
6. Age and professional employment.

Based on the obtained results, an analysis was made regarding the attitudes and opportunities of the veterinarians working in the veterinary sector to respond to modern challenges related to innovation and digitalization processes.

3. RESULTS

In the era of digitization in the agriculture and the advent of e-agriculture and precision agriculture (FAO, 2016) as well as precision animal husbandry (Beckman D., 2017), it would be appropriate to assume that data-driven technologies and services have the potential to improve the efficiency of the production and quality of food of animal origin throughout the agri-food chain. In addition, the digital technologies can be part of the solution to addressing the impact of global trends such as population growth, land-use change and climate change on the global food systems, the interactions among the people, wildlife and domestic animals and the global threats to health (Trendov N.M., Varas S. , & Zeng M., 2019).
The use of data-driven technologies will continue to change not only the manufacturing agro-sectors, but also the veterinary sector as a part of world economy, which is no exception. The potential benefits from the digital transformation and processes' digitization in the veterinary and animal health sectors are likely to unlock new models that will make official and private veterinary activities more efficient in response to the new challenges related to the new EU food safety legislation and new treatment practices and standards in private veterinary medicine. An important question is whether official veterinary control and veterinary medical practices will be able to adapt to the

rapidly progressing digitalization in other spheres of society and economic activities.
Achieving the full potential benefits and desired outcomes of the digital transformation is a challenge in all sectors, but in the veterinary sector the rapid progress of digital transformation is largely determined by the aging of staff in the public veterinary service and the private veterinary practices. The aging of the veterinary workforce is mostly reflected in the understanding of opportunities and the application of digital skills, especially in a world of rapidly evolving technologies and capabilities. Another challenge related to the aging of the veterinary specialists and auxiliaries is the adaptation of their technical competence in application of quality management systems for the veterinary medical activity, with a view to optimizing the available resources and performed services.
As stated in the article Digital technologies and implications for Veterinary Services (El Idrissi A.H. et all, 2023), looking at digital technologies and implications for the veterinary services globally, the World Organization for Animal Health (WOAH/OIE) is promoting the digital transformation of animal health, especially for the management of animal disease data using the platform of the World Animal Health Information System (OIE-WAHIS). The interface allows data to be viewed, analysed and extracted more quickly in various analytical programs. Through digitization, the WOAH seeks to streamline the distribution and analysis of animal health data for all stakeholders. Improved digital capacity will also support professional engagement and compliance with international standards. Such measures increase transparency, adaptability, preparedness and resilience to better address challenges at community, national, regional and international levels (WOAH, Boosting digital support to Veterinary Services. Seventh Strategic Plan (2021-2025), 2023). But the aging of the workforce in the veterinary sector makes it difficult to use the specialized software products and platforms that require the relevant computer literacy and competencies acquired in the education system relatively recently.
The digitization is one of the six priorities of the European Commission aimed at empowering people with a new generation of technology (Parliament, 2023). Bringing the European Union's single market into line with the digital age requires removing unnecessary regulatory barriers and moving from separate national markets to a single EU-wide rulebook. The EU's Digital Single Market strategy is built on three pillars:

- Access: better access for consumers and businesses to digital access and services across Europe;
- Environment: creating appropriate conditions and a level playing field for the flourishing of digital networks and innovative services;
- Economy and society: maximizing the growth potential of the digital economy.

The World Food and Agriculture Organization is also in the process of upgrading its EMPRES Global Animal Disease Information System (EMPRES-i). These global platforms together with the corresponding regional platforms plays a critical role in the management, governance and use of animal health data at global and regional economic levels to accompany the digital transformation of veterinary services.
According to the Global Animal Health Association (Global Animal Health Association, 2023), the new digital tools and services are constantly revealing new potential to improve the key pillars of protecting and maintaining good animal health. This potential includes prediction, prevention, monitoring, diagnosis and treatment. The modern data and analytics infrastructure enable knowledge to be aggregated globally, nationally, regionally and across animals within each region so that:

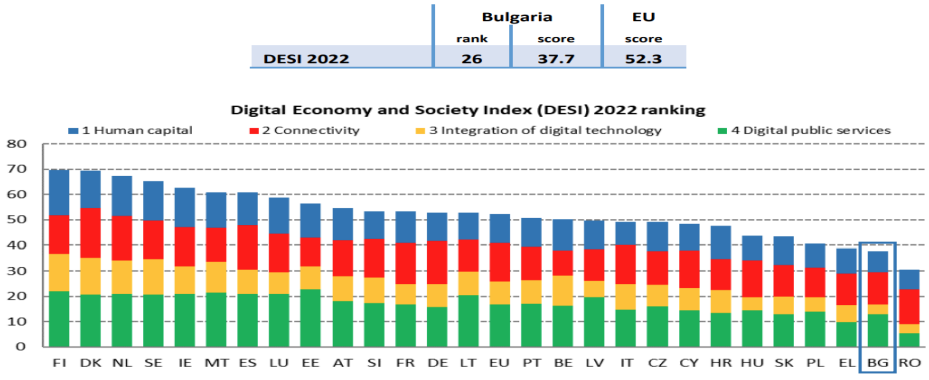
- the veterinarians faced with a rare condition or disease can use information gleaned from the experiences of others to better understand treatment options.
- the researchers, who look for subtle signs of health changes, can use machine learning to analyse endless animal profiles and diagnostic results so that to fine tuning the new prevention

protocols.

- the livestock traders can rely on digital tracking systems that allow them to see how animals are raised and their produce reaches store shelves, helping them to inform consumers about the safety and sustainability of production.

Additionally, the digital technology enables a level of individualized care for each individual animal that has never before been achieved in animal health. The farmers can identify the first animal to become ill in a herd of thousands based on a cough, fever or change in activity level. Small animal veterinarians can create personalized lifetime health plans built on the accumulated experience of many similar pets that anticipate problems and give owners greater peace of mind.
The digital technologies are of great importance in strengthening prevention, productivity, the interdependence between human and animal health and the environmental changes associated with the One Health approach and holistic animal care. This includes the three main areas of innovation – predictive, monitoring and diagnostic technologies. The digitization of diagnostics provides more, better and earlier data on the signs and symptoms of ill health, contributing to a better understanding of how animal health conditions develop and how to predict, prevent and treat them.
The digitization in the veterinary sector enables digital monitoring, providing stronger protection against the spread of disease within a group of animals and between animals and humans. From microphone systems that identify fluctuations in pet vocalizations to computerized patient records and pet activity tracking, all of which are helping owners and veterinarians care for pets in new ways, technology has eased the burden of monitoring and bridge the gap in communication between animals and humans. This data is increasingly aggregated to build veterinary intelligence systems that can predict changes in an animal's health before they even occur, allowing for preventative measures and personalized health plans. Tools already exist that can collect and cross-reference animal health data and alert the farmer or veterinarian to an emerging problem based on animal behavioural signs, biological markers, or diagnostic results. The digital monitoring enables surveillance, diagnosis and prediction and has the potential to transform animal health so that the animals and their animal keepers can reap all the benefits of long, productive and healthy lives.
Every year, the European Commission publishes the results of the Digital Economy and Society Index 2022 (European Commission, 2023), which tracks the progress made in EU Member States in the field of digital technologies. The level of the Index for the last year 2022 shows that Bulgaria ranks 26th out of the 27 EU member states in the penetration of digital technologies in the economy and society (DESI). Bulgaria's DESI score has grown by an average of 9% per year over the past five years. (Figure 1). Given the positioning of Bulgaria, this growth rate is not sufficient for the country to catch up with the other member states.

Figure 1. Ranking of the EU Member States in terms of the levels of the Digital Inclusion Index in the Economy and Society (DESI) for 2022.

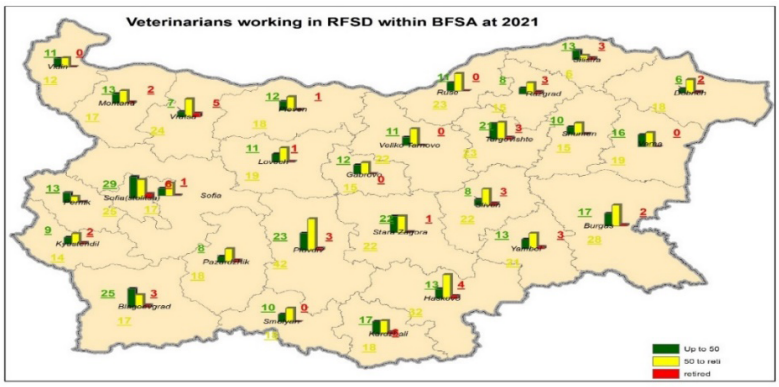


Source: https://digital-strategy.ec.europa.eu/en/library/digital-economy-and-society-index-desi-2022 .

According to a study carried out by the Bulgarian Chamber of Commerce (BCC, 2023), Bulgaria is the last in the EU in terms of the share of the population possessing at least basic digital skills, 29% compared to 56% on average for the EU. Only 11% of individuals possess skills above the basic (34% EU), with only 19% of the workforce in 16 economic sectors covering Bulgaria and the digital divide – digital competence skills for the key position they hold. In our opinion, one of the reasons for this is the aging population and an increase in the average age of the employed.

As already mentioned above, one of the problems related to the introduction of innovations and digitalization in veterinary activity are demographic and social problems affecting the veterinary profession. Therefore, in 2021, the National Round Table "Challenges to the Veterinary Profession and Digitalization" was held at the Trakia University in Stara Zagora. The main topics included the challenges of demographic and social issues relevant to the veterinary profession and digitization in the veterinary profession. From the analysis and conclusions made during the round table, it was concluded that the number of official veterinarians by region who have reached the age of 50 or are retired is much higher than that of veterinarians under the age of 50. The results are given in Fig.2 (Makaveev E., 2021).

Figure 2. Number of veterinarians by region and division by age.



Source: National Roundtable: Demographic and Social Challenges Affecting the Veterinary Profession. 2021., Trakia University Stara Zagora.

The situation is similar for veterinarians practice with productive animals (Parvanov M. , 2021). As the author points out in his presentation, out of 2554 practicing veterinarians - members of the professional organization, only 956 veterinarians practice with productive animals, 130 of them are due to retire in the next 5 years, 92 of them are working pensioners.

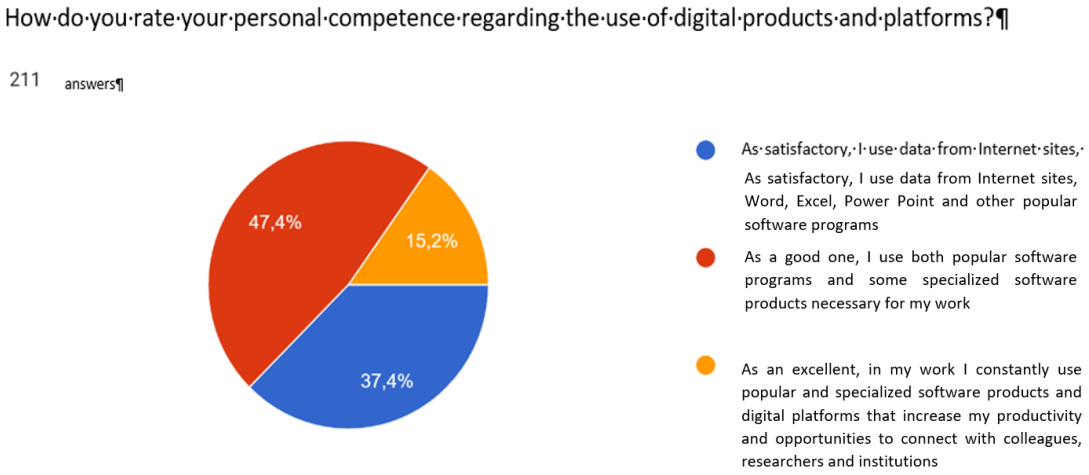
The analysis of the current state of play in the veterinary sector in Bulgaria in terms of the level of digital competence and awareness was based on the results of the survey conducted in the form of an internet questionnaire among the working veterinarians and the veterinary students of the two veterinary faculties in the country with the aim of exploring the attitudes of the introduction of innovation and digitalization and to see how these attitudes correspond to their age of the veterinarians working in different fields of the veterinary sector.

Of the 211 veterinarians and veterinary students surveyed, 34 were under the age of 25 (16.1%), 20 - from 26 to 35 years (9.47%), 53 - from 36 to 45 years (25.11%), 42 - from 46 to 55 years (19.90%), 52 from 56 to 65 years (24.64%) and 10 over 66 years of age (4.73%). It is necessary to specify that in Bulgaria the retirement age in 2023 for women is 62 years and for men it is 64 years and 6 months and it will increase in each subsequent year at a greater rate for women until they reach 65 years and equalization of the retirement age for men and women in 2037. 35.1% are employees or managers in the Bulgarian Food Safety Agency (BFSA), 19% are students, 14.2% are official veterinarians, 8.1% are practicing veterinarians, 7.1% are employees or managers of a private organizations in the veterinary sector, nearly 7% are veterinary teachers, and the rest - employees of the Ministry of Agriculture, working pensioners, members of non-governmental organizations and employees in

the state administration and others.

To the first question: "How do you rate your personal competence regarding the use of digital products and platforms?", the 15.2% of the respondents answered that they have excellent competence and in their work they constantly use popular and specialized software products and digital platforms that increase their productivity and opportunities to connect with colleagues, researchers and institutions, most respondents (47.4%) answered that they have good competence and use both popular software programs and some specialized software products necessary for their work, and for 37.4% of respondents, their competences are reduced to using data from Internet sites, Word, Excel, Power Point and other popular software programs (Figure 3).

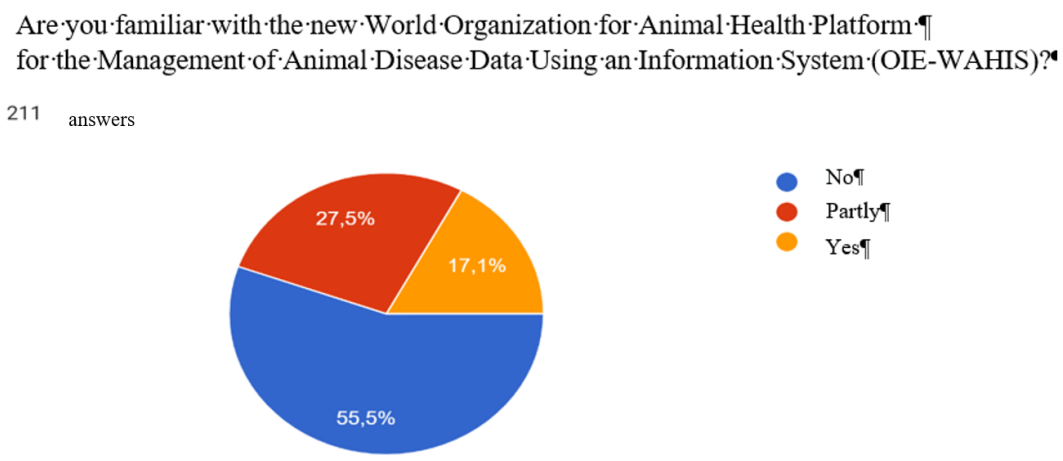
Figure 3. Percentage distribution of responses to the question: "How do you rate your personal competence regarding the use of digital products and platforms?"



Source: Authors' own research.

The second question: "Are you familiar with the new platform of the World Organization for Animal Health for the management of animal disease data using an information system (OIE-WAHIS)?" was dominated by negative responses (55.5%), followed by answer "Partly" (27.5%%) and "Yes" - 17.1% (Figure 4). Considering the functionalities of the platform, which enables quick access to the data related to the epidemiological situation regarding infectious diseases in the World, it should be expected that more employees in the veterinary sector are familiar with it.

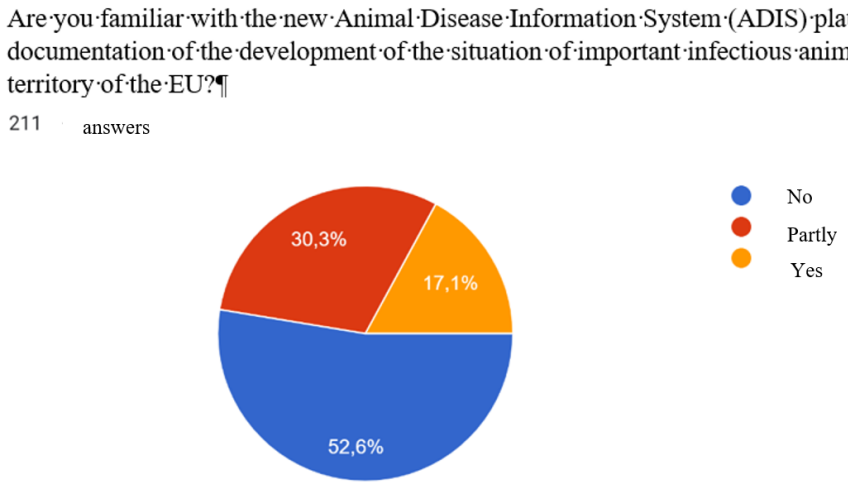
Figure 4. Percentage distribution of responses to the question: "Are you familiar with the new World Organization for Animal Health Platform for the Management of Animal Disease Data Using an Information System (OIE-WAHIS)?"



Source: Authors' own research.

The next question is similar, that sounds: "Are you familiar with the Animal Disease Information System (ADIS) platform for registering and documenting the development of the situation of important infectious animal diseases in the EU?". The answers are also close to those of the previous one, namely: 52.6% answer with "No", 30.3% with "Partly" and 17.1% with "Yes". Accordingly, the comments that can be made to these answers are identical to those of the previous question, since this platform enables access to information on the epidemiological situation in the Member States and is directly related to the movement and trade of animals and animal products in the territory of the EU.

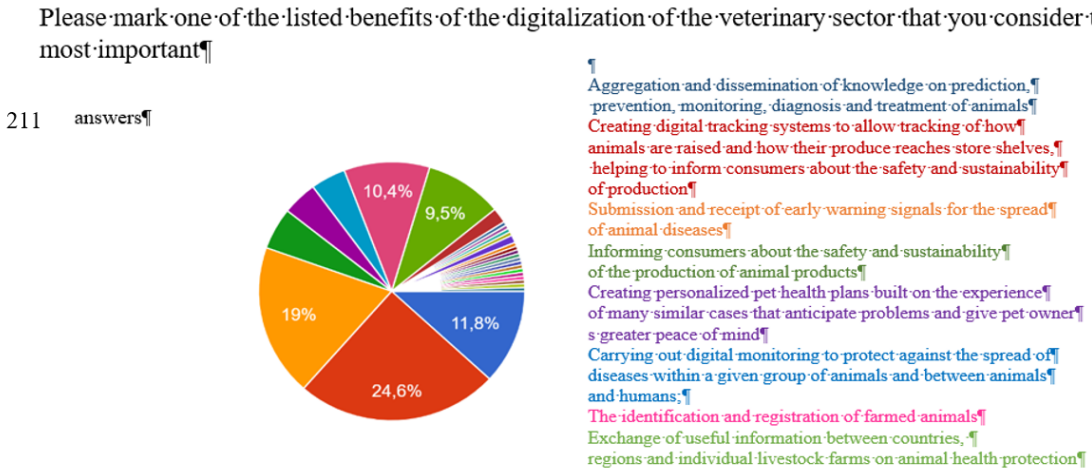
Figure 5. Percentage distribution of responses to the question: "Are you familiar with the new Animal Disease Information System (ADIS) platform for registration and documentation of the development of the situation of important infectious animal diseases in the territory of the EU?"



Source: Authors' own research.

The fourth question asks respondents to indicate one of the listed benefits of the digitalization in the veterinary sector that they consider the most important one. For 24.6% of those surveyed, this is creating digital tracking systems that allow monitoring how animals are raised and how their produce reaches store shelves, helping to inform consumers about the safety and sustainability of production, for 19% it is the ability to submit and receive early warning signals for the spread of animal diseases, 11.8% believe that digitalization supports the aggregation and dissemination of knowledge for prediction, prevention, monitoring, diagnosis and treatment of animals, others 10 .4% are of the opinion that the benefits of digitization in the veterinary sector are reduced to the identification and registration of farmed animals, 9.5% indicate that this is the opportunity to exchange useful information between countries, regions and individual livestock farms regarding the protection of the health of the animals. Important benefits of the digitalization in the veterinary sector are also identified as informing consumers about the safety and sustainability of the production of animal products, creating personalized health plans for animals built on the basis of the accumulated experience of many similar cases, which anticipate problems and provide owners animals better peace of mind and implementing digital monitoring to protect against the spread of disease within a group of animals and between animals and humans. It can be said that all responses indicate different benefits (Figure 6).

Figure 6. Percentage distribution of responses to the question: "Please mark one of the listed benefits of the digitalization of the veterinary sector that you consider the most important".



Source: Authors' own research.

The last question requires answering what difficulties hinder the introduction of innovations related to the digitalization of the veterinary sector. Most respondents answered that it was the lack of information and specialized training about available specialized software products and online platforms supporting veterinary professionals, followed by those who answered that it was the insufficient digital skills of employees in the sector, insufficient funds for digitalization, insufficiently developed specialized software products and online platforms, insufficient hardware equipment - computers, servers, connecting systems and the like, lack of understanding of the benefits of digitalization on the part of the management and lack of support, as well as the lack of connectivity between the IT systems of the main " players' in the livestock and veterinary sector.
The analysis of the results of the respondents' answers to the last question of the survey shows the different problems facing digitalization in the veterinary sector, which do not contradict each other, but "work" at the same time. Of course, the answers also provide grounds for drawing conclusions and taking adequate measures.

4. DISCUSSION

During the Slovenian Presidency of the European Union in 2021, a discussion on digitization in the food chain and control of veterinary activity was launched (Council of the European Union, 2023). In the initial discussion, several Member States' delegations expressed their strong support for the inclusion of digitization in the agenda of the Heads of Veterinary Services of the Member States. Delegations agreed that data collected in the official control system related to food safety, animal health and animal welfare could be used to improve risk analysis and optimize official controls. Delegations agreed that digital tools offer a number of potential and significant benefits that should be explored.
One of the most important issues that were the subject of the discussion was related to the issue of data interoperability. It was noted that all Member States have their own IT systems and data management rules, which have been developed independently of each other. In order to collect information and study how digital the Member States' operations in the veterinary field are, a questionnaire was distributed on the current state of digitization in the Member States. The response rate to the questionnaire was 100%, and the results showed that Member States have definitely implemented digitization in their administrative operations only to a certain extent, but the extent of their implementation varies. Countries participating in this discussion also noted other potential challenges, such as investments in hardware and software, staff training and connectivity issues

(GSM coverage). According to the proposals for further development at the general level of the Member States, several areas to be taken into account were identified:

- Defining common standards for data interoperability within and between the Member States, along with defining terminology (sample, unit, result, etc.);
- Simplification of data entry, reporting and cooperation between competent authorities);
- Inclusion of new data sources (from farmers, laboratories and food operators);
- Gradual elimination of paper-based procedures;
- Guidelines for effective and efficient data analysis;
- Machine learning (AI) development;
- Official control planning based on data analysis (knowledge-based risk assessment);
- Construction of a single IT system (for Member State), including all used databases.

In the field of food safety, the inclusion of information on hazard analysis and critical control points (HACCP) in food production was mentioned, as well as digitization for data exchange, in accordance with Regulation (EC) 853/2004 (Annex II and III).
In the area of animal health and the use of veterinary medicinal products (VMP), special attention was paid to the monitoring of the sale and use of the VMP. Animal diseases need to be monitored more effectively. This would enable faster alerts in relation to outbreaks of infectious animal diseases. The data could also be collected for zootechnical purposes (farm animal genetics). Attention was drawn to interoperability within the One Health approach, which could be used to improve communication in the fight against antimicrobial resistance.
Another important area where digital solutions show significant potential is animal identification and registration. Regarding the mandatory physical checks on animal identification, it was suggested that the focus should be on farmers who, according to national databases, do not comply with identification requirements. This would improve the control and efficiency of animal identification. Member States also highlighted the issue of identification of horses and the easy exchange of information between Member States in this regard.
Data related to the difficult handling of digital products in different human age categories were reported at the round table organized by the Human Resources Development Centre on the topic "Increasing digital skills and using microcredits as an opportunity for better professional realization", which was held in 2022 in the city of Sofia (Tomov T., 2023). The conclusions drawn were that the main group of workers over the age of 50 in all sectors of the economy, represents about 63% of the labour force in Bulgaria, correspond with the presented data regarding veterinarians over the age of 50. These groups have similar criteria regarding generational attitudes towards new technologies, including the digitalization of veterinary medicine.
According to the participants in the round table, the group over 50 years of age is resistant to change, focuses on tried and tested methods of the past and on the risk of the present. They worry not only about their personal security, but also about the consequences of society's growing dependence on technology. They use the technology primarily as a productivity tool rather than a connectivity tool like younger colleagues. According to them, change threatens and challenges their inherent attitudes towards stability, predictability and security. They focus on problems, believe that the revolution in technology is a threat to jobs and leads to side effects.
At the same time, increased pet visits have led to increased demand for veterinary services, leaving veterinary staff struggling to manage the capacity to treat an average of 30 or more pets per day, which equates to serving one patient for every 15 minutes. The impact of this overloaded capacity is severe, especially with the use of outdated, inefficient administrative systems in the veterinary practices that are commonly used. This is evidenced by the fact that 80% of veterinarians still use

outdated legacy systems (or even still work manually), suggesting that industry modernization is long overdue (Atomico, 2023).

A step in the right direction and encouraging the development of digital skills among veterinarians could be the development and inclusion of teaching materials for veterinary students in their curricula. Similar examples are given by Spaeth, E. et al. (Spaeth, 2018) (Placeholder1), which focus on the development of digital citizenship skills that veterinary students realize as a necessity for their professional and personal development after graduation - digital identity management, professionalism in an online environment, digital well-being, productivity skills including management of digital distractions, and communication and collaboration online. It was found that by using current digital possibilities and virtual environment universities could transform the learning methods and approaches to be attractive to students (Bie & Lipman, 2012) and simultaneously useful for their professional development through application games based on virtual patients and realistic scenarios.

Furthermore, there have already been introduced modern digital technologies in several fields of veterinary medicine as veterinary pathology (Bertram & Klopfleisch, 2017). Such achievements as Pathologist 2.0 are based on virtual microscopy and besides being helpful in education, they are extremely efficient for veterinary practitioners and pathologists.

The hopes for improving Bulgaria's position with regard to the digitization of the economy and, in particular, the veterinary sector, are connected with the adopted National Program Digital Bulgaria 2025 and the strategic document "Digital Transformation of Bulgaria for the period 2020-2030" (Universities of Science, 2023). The main measures provided for in the document are aimed at:

- Deployment of secure digital infrastructure;
- Ensuring access to adequate technological knowledge and digital skills;
- Strengthening the capacity for scientific research and innovation;
- Unlocking the potential of data;
- Digitization in favour of a circular low-carbon economy;
- Increasing the efficiency of state administration and the quality of public services.

Bulgaria has already allocated 2 million euros from the national budget for 2021 to launch projects for the training of academic staff, teachers and specialists. Bulgaria is investing 2.9 million euros for the creation of 21 personal development centres focused on digital literacy. These centres will provide free formal and informal training in digital skills, including cyber security and best practices for safe internet browsing. However, since the number of official regional veterinarians who are over 50 years old or retired is much higher than the number of veterinarians under the age of 50, the forms for lifelong learning.

These tendencies are part of the whole concept of transforming the veterinary profession to meet the expectations of the society. As the need to prepare the veterinary profession for the new digital era is fully recognized by academia, veterinarians and veterinary specialists in the private and public sectors, the European Coordinating Committee on Veterinary Training (ECCVT), European Board of Veterinary Specialisation (EBVS) and the Federation of Veterinarians of Europe (FVE) acknowledged that the profession should proactively take responsibility to look into issues related to certification of Artificial Intelligence ensuring their reliability, to ownership and use of big data, as well as, to professional liability (FVE, 2019).

5. CONCLUSION

Based on the analysis, the following conclusions can be drawn:

1. The innovation is changing the world economy at a rapid pace through the emergence of a range of cutting-edge digital technologies offering great potential to improve food production to feed a growing population, promote more environmentally sustainable agricultural practices and maintain high quality sanitation standards. This also applies in full force to the introduction of digitalization in veterinary medicine.

2. The digital technologies are rapidly transforming veterinary medicine, including animal health and welfare. This transformation will continue over the years with ever larger and large-scale activities in all veterinary activities.

3. The human resources are put "at risk" due to the shortage of qualified personnel - veterinarians, who are necessary for the implementation of digitized highly specialized activities under the official veterinary control. This in turn leads to extreme overburdening or subsequent outsourcing/delegation of a large part of official control activities.

4. It is necessary to review the training of veterinary students and to introduce innovative disciplines for the quality management of veterinary activity with an emphasis on digitization.

5. Mechanisms must be created by the state and professional veterinary organizations to increase the "communicative culture" of veterinarians aged 50 years and older.

6. Access to easy credit schemes for the re-equipment of veterinary medical facilities with an emphasis on innovative and digital technologies.

7. The digital competence of those employed in the veterinary sector is not high enough and is mainly reduced to the use of popular software products, but not to the use of specialized ones developed specifically for their activity. This is also confirmed by the fact that most respondents answered that they did not know the new OIE-WAHIS and ADIS platform.

8. It can be said that veterinary professionals are aware of the benefits of digitization of the veterinary sector. These are the traceability capabilities to allow full transparency in tracking the entire life cycle of animals, their movement, as well as their harvesting and marketing and their derived animal products in line with the barn-to-table strategy. This includes the use of innovation and digitization in all areas of veterinary activity, and especially to inform users about the safety and sustainability of production, to provide and receive early warning signals for the spread of animal diseases, to aggregate and disseminate predictive knowledge, prevention, monitoring, diagnosis and treatment of animals, for the identification and registration of farmed animals, for the exchange of useful information between countries, regions and individual livestock farms regarding the protection of animal health, etc.

9. The lack of information and specialized training for available specialized software products and online platforms, the insufficient digital skills of employees in the veterinary sector, insufficient funds for digitization, insufficiently developed specialized software products and online platforms, insufficient hardware equipment - computers, servers, connecting systems and the like, lack of understanding of the benefits of digitization on the part of the management and lack of support, as well as the lack of connectivity between the IT systems of the main "players" in the livestock and veterinary sector. In this regard, the heads of the veterinary institutions must take measures to train specialists, but first understand the benefits of digitization themselves, and software specialists in cooperation with those from the veterinary sector to develop software products and platforms necessary for the sector.

10. Part of the problems facing digitization in the veterinary sector can be explained by the aging of the workforce. In the first 25 years of a person's working life up to the age of 50, just over 360 people are employed in this sector, while those from the age of 51 to retirement age are about 550 people, and 60 specialists work after retirement. This also explains the responses of insufficient digital competence and ignorance of basic platforms and programs in favour of veterinary professionals, as older people are known to have a harder time acquiring computer skills.

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