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DETERMINATIVE ROLE OF USING DIGITAL MARKETING TOOLS FOR THE AGRICULTURE DEVELOPMENT

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Abstract

The theoretical and methodological research presented in the scientific paper is to define and rationale of an optimal approaches and tools of digital marketing in the agricultural industry in the context of dynamic acceleration of modern society's globalization and digitization processes. The purpose of the research is to define the role of using digital marketing tools for the agriculture development which includes a wide range of digital communication tools for providing the target audience with commercial information using modern information and digital technologies, while providing enterprises with wide opportunities for effectively focus its communication channels, conduct operational analysis market conditions and establish feedback with consumers.

In research have been conducted an electronic survey (interviewed 120 farmers) in agricultural sector from Kyiv region of Ukraine according to the following main criteria: the main features of the socio-demographic profile of the respondents, the awareness level of digital marketing methods among farmers, the impact of digital marketing in agricultural sector in order to identify the farmers and dealers' views, awareness level and positive, negative impact of implementing and using of digital marketing tools in agricultural sector. The use of the statistical method (Chi-square test) based on the use of representative sample observation helped to synthesize a reliable information database for analytical calculations. The method of generalization and synthesis created an opportunity to accumulate the entire range of scientific results obtained into a single concept that reflects the relevance of the topic, to identify the key directions of development, goals, objectives and features of the adaptation of tools and methods of digitalization in the activities of the enterprises of the agro-industrial complex. The method of analytical diagnostics enabled to conduct research on the main indicators and coefficients characterizing the level of coverage and intensity of the use of digital marketing technologies in the national agricultural sector.

The main aspect of the results approved that almost half of the respondents were shown that complex of instrument and methods of digital marketing plays crucial role, especially in war period. It helpful to the farmers to increase the selling price and reduce the marketing cost of their products. Many young farmers are ready to adopt digital marketing. Central and state governments conduct awareness campaigns about digital marketing to farmers and make a policy towards the sustainable digital agricultural market development.

The results of the conducted research in the direction of diagnostics of the processes of digital transformation of the national agricultural complex in order to substantiate the actualization of using and implementing the digital marketing tools and methods by farmers lead to the conclusion that using the technologies of digital marketing is a key factor for improving the efficiency of national agricultural production in order to increase their amount sales and its promotion not only physically but also in on-line environment, as well as a key success factor for achieving a high level of competitive advantages both in domestic and foreign markets.

Key words: *Agricultural sector, Digital marketing, Digital marketing tools, Digitalization of agriculture, Survey data, Digital agricultural market, Sustainability of socio-demographic development.*

1. Introduction

The introduction of modern information and communication technologies is currently taking place at a rapid and dynamic pace. Every day information technologies are increasingly penetrating into all spheres of our lives, causing structural, organizational and transformational changes. The tools and methods of digitalization enable organizations to make optimal decisions for long-term development faster and more efficiently.

The degree of introduction of information technologies in agricultural sector directly depends on the level of economic development of the industry and the national economy as a whole. In this aspect, in order to expand the scale of informatization and deepen the implementation of effective information and communication tools and methods, along with economic conditions, political, technical, social and innovative components of successful development of the agro-industrial complex on a digital basis is the use of digital marketing tools and methods.

At the current stage of development, the level of the economic situation of Ukraine does not meet the modern requirements of rapid information and digital progress for a number of reasons, the key of which are: the rapid spread of COVID-19; unfavorable political conditions for the formation of a priority position in the market; low investment volume in the agricultural industry; and lack of financial resources allocated for the development of the agriculture; and an increase in inflation.

The digital marketing transformation of the national agro-industrial complex is already underway. Agricultural enterprises use technologies of digital marketing one of the innovation developments by the government to sell products digitally without the intervention of mediators. The agricultural company's presence in the digital environment and active promotion are the keys factors to attracting a new audience and increasing its loyalty. In addition, digital marketing, unlike traditional marketing, makes it possible to collect and analyze data on the results of promotion in order to adjust the marketing strategy, increasing its effectiveness. It should be noted that the introduction of digital technologies will significantly increase the efficiency of agricultural production, increase the turnover of the industry. Therefore, to start the process of intensification of information development, the country needs to choose a real resource-saving way of effective use of digital capital.

Applied aspects of the impact of modern information and communication technologies on the functioning of agricultural sector in the context of digitalization processes were studied by such famous scientists as: Ladychenko and Tronko [6], Shubravska *et al.*, [12], Sidorov and Babenko [13], Fedorchenko, Tarasevych, and Kubiv [17], and a number of others. Among foreign scientists should be highlighted the works of: Bacco *et al.*, [1], Balu [2], Bowen and Morris [3], Chavas and Nauges [4], Payne [5], Ladychenko and Tronko [7], Rockström *et al.*, [10], Varas [11] and many others, and organizations as World Economic Forum [8].

Domestic and foreign scientific opinion has accumulated a considerable experience in dealing with the problems of the development and improvement of an optimal approaches of digital marketing in agricultural sector. A number of scientific papers in the public domain on the research the Impact of digital marketing in agricultural sector on regional and national level. It is worth noting the works of such authors as: Zghurska *et al.*, [9], Larina *et al.*, [16], and Somkina *et al.*, [19].

Recognizing the significant contribution of scientists, it should be noted that the acceleration of the development of digital marketing technologies and their impact on the transformation processes in the national agricultural sector determine the urgent issue of in-depth research of new challenges and realities of the information development of the industry for the long term.

To solve this problem, it is proposed to research the key vectors of successful marketing digitalization of the agricultural sector, the feasibility of using the conceptual instrumental and methodological basics of digital marketing in agricultural sector in order to minimize economic risks and increase the economic efficiency level in the long run.

The purpose of this scientific article is dedicated to the development and improvement of an optimal approaches of digital marketing in agricultural sector in the context of dynamic acceleration of modern society's globalization and digitization processes.

2. Materials and Methods

To achieve this purpose, we conducted an electronic survey (interviewed 120 farmers) in agricultural sector from Kyiv region of Ukraine according to the following main criteria: the main features of the socio-demographic profile of the respondents, the awareness level of digital marketing methods among farmers, the impact of digital marketing in agricultural sector in order to identify the farmers and dealers' views, awareness level and positive, negative impact of implementing and using of digital marketing tools in agricultural sector.

The use of the statistical method (Chi-square test) based on the use of representative sample observation helped to synthesize a reliable information database for analytical calculations. The method of generalization and synthesis created an opportunity to accumulate the entire range of scientific results obtained into a single concept that reflects the relevance of the topic, to identify the key directions of development, goals, objectives and features of the adaptation of tools and methods of digitalization in the activities of the enterprises of the agro-industrial complex. The method of analytical diagnostics enabled to conduct research on the main indicators and coefficients characterizing the level of coverage and intensity of the use of digital marketing technologies in the national agricultural sector.

3. Results and Discussion

Increasing the efficiency of agriculture sector's innovative development requires the use of modern information and communication technologies for the organization and management of economic activities, automation and robotization of agricultural production. In the context of globalization and deepening intersectoral ties, the agrarian sector has become the basic innovative component that shapes the trends of efficiency growth for related industries, so the digitization of the agrarian sector is of paramount importance for improving the efficiency of production and processing of products.

It should be noted that the national agricultural production is characterized by a huge potential for long-term development by increasing the efficiency of the use of land, labor and biological resources, the full use of which requires the improvement of high production technologies and the formation of an information management system [19]. The key feature of such systems is the processing of a large amount of data, the results of processing, systematization and analysis of which will help to achieve high performance indicators, improve technical and technological solutions and strengthen production capacities [6].

As the practice and experience of developed foreign countries shows, the expansion of the scope of application of information technologies in the agrarian sector can significantly increase the efficiency of the agroindustry. In our country, the spread of IT technologies is rapid, ranging from crop planning, automation of fertilizing and digital modeling of the yield to the calculation of fodder rations for animals and birds.

In these conditions many of agro-industry companies were started to sell their products digitally. Young Agriculturalist are ready to adopt digital marketing tools to reach their products globally. Even though digital marketing concept reaches all the business sectors, in agricultural sector digital marketing involvement is less because of the following reasons, namely such as [4]:

- Lack of knowledge in digital sphere;
- Existence of information security problems;
- The high cost of an innovative startups' launching;
- Lack of digital marketing tools;
- Fear of using new digital marketing tools and methods;
- Lack of an appropriate level of professionalism in the field of digital marketing.

On the other hand, the international political situation pushes our country to significant transformations in the agricultural sector. In order to avoid existing and potential threats to national food security, digital transformation of the national agricultural sector is necessary [3].

In the traditional sense, in the field of agricultural production is a clearly pronounced dependence on the influence of the following factors, namely: the human factor, relatively low yields at relatively high production costs, flexible price conditions. One of the global challenges of the digitalization of the agriculture is to change all the mechanisms of the system of management and development of an agricultural enterprise. The network revolution has radically changed the cost structure of agribusiness and, therefore, the mechanism of profit formation. It should also be noted that the spread of the Internet and the use of digital technologies have led to a significant reduction in transaction costs for searching for information, concluding agreements, selling goods and services. Additionally, it also provided zero marginal transformation costs for agribusiness, since the creation of copies of digital goods, their distribution on the Internet is practically free. That is why marketing digitalization should also be considered as one of the key factors for the sustainable development of rural areas [5].

Digital agriculture is focused directly on increasing the level of efficiency of each business operation, which depends on the level of digitalization of agricultural machinery, the availability of sensor tools, unmanned aerial vehicles and other digital elements [10]. Modern management of sales and implementation processes in agriculture requires marketing digitization and digitization, which allows to ensure a high level of profitability at a relatively low cost.

In connection with the above, it should be explored and defined the key aspects of investment policy in the development of agri-food startups to form a full-fledged large-scale vision and identify the main success indicators for the digitization of the agricultural sector with the aim of effective IT development in the present and future. In this aspect, consider the dynamics of financing agri-food startups from 2012 to 2022 [14] (Figure 1).

The analysis of the dynamics of financial investments in agri-food startups on a global scale indicates the dynamic increase in funding and demonstrates galloping growth. The main focus of investors is online sales channels. In 2022, the largest amount of investment was attracted in the development of e-commerce and marketplaces, where total investments amounted to USD 13 billion, which demonstrates the transition of the national agro-industrial complex from offline to online. The volume of investments in e-commerce shows a positive trend and confirms the importance of solving the issues of efficient production of products and its fast and high-quality delivery to potential consumers [15].

The giants in investing in agri-food startups in 2021 were the United States (online food trading, satellite imagery, bacteria production), China (online food trading, Meicai marketplace) and India (online food trading, restaurant marketplace): USD 8.9 billion, USD 5.5 billion and USD 3.4 billion respectively. Europe lags far behind, which is explained by the advantage of these three countries in investment activity and the overall development of the information programming and forecasting digital market [11].

It should be taken into account the fact that not all representatives of the industry are confident in the positive economic effect of the introduction of market digitalization tools and methods, without providing thorough and convincing calculations of the inexpediency of using the instrumental and methodological complex of digital marketing. The up-gradation of technological development has changing the marketing style of products and services. Today many of the companies are prefer to use digital marketing because of number of benefits like cost and time saving, affordability and flexibility. But in agricultural sector many of the farmers are not aware of digital marketing to sell their products [13].

In the research uses primary survey data conducted from farmers through interview schedules in Kyiv region, which includes districts as follow: Bilotserkiv district, Boryspil district, Brovary district, Vyshgorod

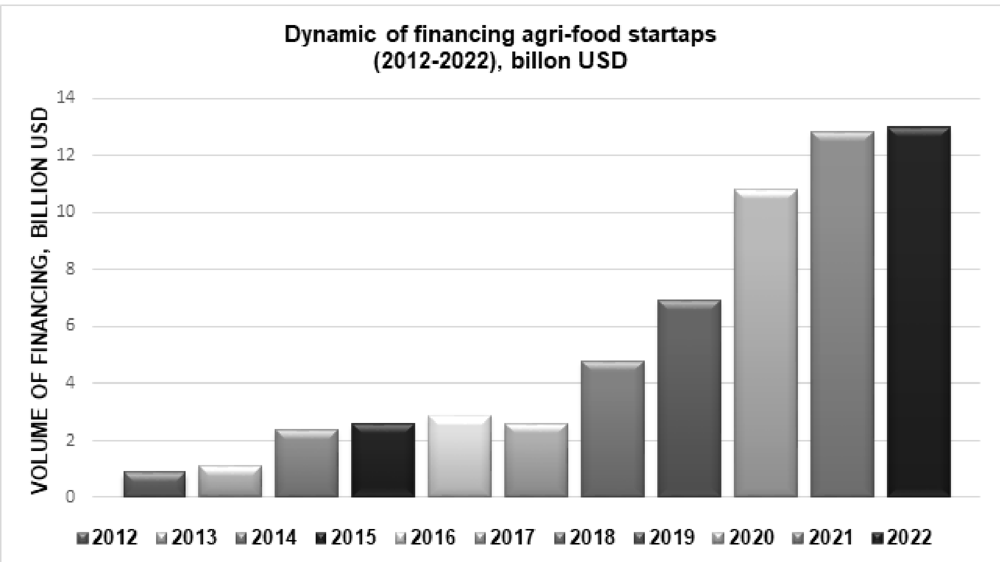

Figure 1. Dynamics of financial investments in agri-food startups on a global scale
Source: formed by the author on sources [14, 15]

district, Obukhiv district, Fastiv district and Buchan district. Boryspil district is the most developed district in the Kyiv region. The rural population of the district covers almost 53% of the population, while the urban population - 47%. This research makes use of a well-structured questionnaire that was designed on the basis of an extensive literature review. In this context, principal data have been collected using the method of simple random sampling.

The Boryspil district region's farmers have been chosen at random. In this study convenient random sampling technique has been used and 120 respondents were selected on random basis. Primary data have been collected with the help of experienced enumerators. They imparted social and professional ethics in a two-day training to collect primary data on socioeconomic variables. A pilot survey was conducted to get early access to the results of our study. The main survey has been conducted from October to December, 2022. The data was cleaned and put in the SPSS program (Statistical Package for the Social Sciences) for the purpose of analysis and report writing.

Primary data conducted from farmers through interview schedules. The various secondary information sources used for the present research include the journals, websites and other sourses of information. The data collected was analyzed through percentages, frequencies and Chi-Square tests are applied for the analysis of data. In order to determine the relationship between indicators of socio-demographic and economic development of the Kiyv region in the research has been analyzed demographic profile of the respondents (Table 1).

Data analysis of Table 1 regarding on the demographic profile of the sample respondents indicates that male respondents are higher persentge than female respondents. The majority of respondents belong to the age group from 26 to 40 years, and the level of secondary education is higher compared to other educational groups. Majority of the respondent's family have more than 4 members and majority of the respondent's family monthly income is within limits of 541.72- 812.58 dollars.

Figure 2 shows the various sources of awareness about digital marketing platform where most of the respondents are aware about digital marketing tools and methods, through on-line advertisement, friends and relatives from social media platform etc.

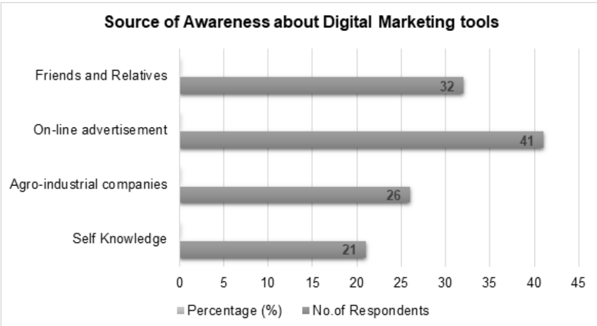

Figure 2. The main source of awareness about digital marketing tools and methods
Source: calculated and built by the author

Table 1. Demographic profile of the respondents

Demographics database		No. of respondents	Percentage share, (%)
Gender	Male	56	**80.33**
	Female	23	**19.17**
Age	18-25	45	**14.17**
	26-40	42	**37.5**
	41-50	34	**26.67**
	Above 50	72	**21.67**
Educational Qualification	No formal Education	16	**13.33**
	Secondary school	13	**30**
	High school	42	**35**
	Degree Level	57	**12.5**
	Others	16	**9.16**
No. of members in afamily	2	3	**4.17**
	3	14	**10**
	4	87	**32.5**
	Above 4	75	**53.33**
Family monthly income, euro	Below 500	32	**20.83**
	500 - 750	78	**34.17**
	750 - 1,000	24	**28.33**
	1,000 - 1,250	78	**13.33**
	Above 1,250	**8**	**3.33**

Legend: Source: Author's calculations.

The Figure 3 states that the awareness level of different digital marketing tools: 37.5% of the respondents are well aware of social media marketing, 30% of the respondents are slightly aware about e-mail marketing, 26.67% of the respondents are somewhat aware about website marketing, 29.17% of the respondents are not at all aware about content marketing and 35% of the respondents are aware about mobile marketing, 43.33 % of the respondents are extremely aware about on-line and TV advertisements (Figure 3).

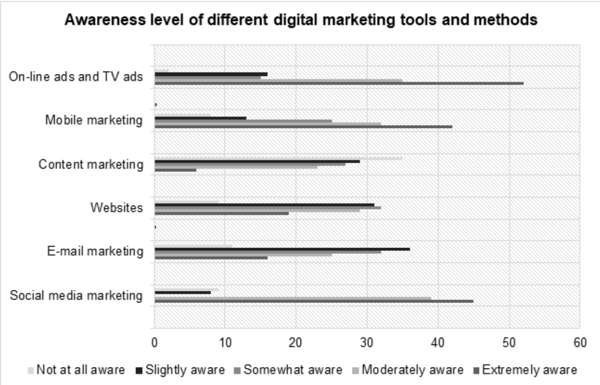

Figure 3. The main source of awareness about digital marketing tools and methods
Source: Calculated and built by the author

In order to determine the level of relationship between educational qualification and awareness level of different digital marketing tools and methods, in the reseach have been used chi-square test. Chi-square formula is a statistical formula to compare two or more statistical data sets. It is used for data that consist of variables distributed across various categories and is denoted by χ^2. To calculate chi square, we take the square of the difference between the observed (o) and expected (e) values and divide it by the expected value. Depending on the number of categories of data, we may end up with two or more values. Chi square is the sum of those values. The chi-square formula is: $\chi^2 = \sum (O_i - E_i)^2/E_i$, where O_i = observed value (actual value) and E_i = expected value.

As a result, has been determined:
Chi-square value = 29.15
Table value = 34.68
Significant level = 5%.

Thus, based on calculations results (the χ2 value is less than table value), it is observed no significant relationship between educational qualification of farmland owners from Kiev region and their awareness level of different digital marketing tools.

In order to determine the level of relationship between age and awareness level of different digital marketing tools, have been used chi-square test.

As a result, has been determined:
Chi-square value = 33.28
Table value = 26.12
Significant level = 5%

Thus, based on calculations results (χ2 value is more than table value), it is observed significant relationship between Age frameworks of farmland owners from Kiev region and their awareness level of different digital marketing tools.

Nowadays, using of digital marketing tools and implementing of digital marketing methods is one of the key activities of national agricultural enterprises. Despite the fact that so far the digital penetration rate among agricultural enterprises (except for large agricultural holdings) is relatively small, the number of farmers using digital solutions will inevitably grow in the coming years, as systems that enable to aggregate, process and analyze a significant amount of data are becoming more and more in demand [16-17]. Agricultural producers who use several digital marketing solutions, such as SEO tools, Social Media Marketing Tools, Content curation and Distribution PPC and Media Buying, Productivity and Remote Working, have the opportunity to significantly increase sales efficiency, significantly reduce the level of non-targeted use of material resources, prevent risk situations. Also, the introduction of digital products makes it possible to streamline processes in large companies, increase business transparency and ensure efficiency, expediency and timeliness of making strategic management decisions for the long-term period of operation and development.

4. Conclusions

- Today innovative solutions in various sectors of the agro-industrial complex appear regularly and on an ongoing basis. National agricultural enterprises are gradually coming to conclusions about the feasibility of introducing digital marketing technologies and guaranteeing economic efficiency in the direction of sustainable development for the long term. It is quite realistic that in the future (in the next 10 years), other things being equal, more than 80% of domestic enterprises will implement effective digital marketing approach and solutions in their activities in the products' sale and promotion on the market to the target audience.
- The change in demand is an extremely important and at the same time complex issue, as domestic farmers are forced to master new technologies in leaps and bounds, rather than gradually, which does not always make it possible to competently adapt new digital solutions, applied aspects of managing the activities of agricultural enterprises and determine their practical benefits.

- The introduction of digital marketing technologies in the agricultural sector is possible only through the application of a program-target approach, as well as improving the efficiency of industry management at the state level. Central national governments should offer, provide and ensure an adequate training to the farmers about digital marketing tools and techniques, as well as awareness campaigns about right and effective using digital marketing tools and methods in an effective manner to increase their amount sales not only physically but also in on-line environment.
- Thus, an optimal approach of digital marketing plays crucial role in modern conditions of digital business transformations. It helpful to the farmers to increase the selling price and reduce the marketing cost of their products. Many young farmers are ready to adopt digital marketing in their agricultural activity. Central governments should conduct awareness campaigns about digital marketing to farmers and make a policy towards the sustainable digital agricultural market development.

- The results of the conducted research in the direction of diagnostics of the processes of digital transformation of the national agricultural complex in order to substantiate the actualization of using and implementing the digital marketing tools and methods by farmers lead to the conclusion that using the technologies of digital marketing is a key factor for improving the efficiency of national agricultural production in order to increase their amount sales and its promotion not only physically but also in on-line environment, as well as a key success factor for achieving a high level of competitive advantage both in domestic and foreign markets.

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