

Article

Digital Transformation of Marketing in Higher Education Institutions: Poland, the Czech Republic, and Ukraine in the Shadow of War

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Abstract

The results of a questionnaire survey of employees at higher education institutions in Poland, the Czech Republic, and Ukraine on the status and prospects of the digital transformation of marketing are presented. The barriers to the digital transformation of marketing are investigated. It is found that the consistency of views on the status and prospects of digital transformation of marketing among higher education institution employees does not depend on the institution's form of ownership. The results of this investigation are particularly important for managers of higher education institutions in the European Union. The Ukrainian experience has raised awareness of the situation under wartime conditions, which may serve as a precedent for future decision-making by European Union higher education institutions under conditions of uncertainty.

Keywords: marketing; digital transformation; higher education institutions; decision-making process; digitalization

JEL: P23, M31, C12, I22, I28

1. Introduction

Nowadays, the development and digital transformation of marketing (DTM) are accelerating from flyers to complex algorithms and strategies for applying artificial intelligence. The advantages of such activities are obvious and include personalization and customer focus of provided services; accessibility of mobile marketing; use of social media platforms to build communities and groups, interaction with the audience and advertising placement; and the use of video marketing as one of the best tools for consumers to perceive information. Kemp's research (2023) confirms the annual growth of Internet users in the world (January 2023): 64.4% of the population use the Internet (5.16 billion people) and 59.4% are active users of social media (4.76 billion people); in January 2024, Kemp (2024b) in its Global Overview Report indicates that these statistical data have increased to 66.2% and 62.3% respectively.

According to Polishchuk et al. (2022), global digitalization and the rapid development of digital technologies are new contemporary challenges, which, among other things, determine the DTM and the adaptation of higher education institutions (HEIs) to the requirements of modern scientific and technological progress. The use of dig-

ital technologies has become crucial since the COVID-19 pandemic, and it was enhanced in Ukraine under wartime conditions. The managers of higher education institutions faced problems concerning daily activity organization. It was necessary to approve decisions urgently and work as usual. Some managers faced with employees' and students' fears that influenced the growing use of digital technologies. We can see that the main challenges in implementing digital technologies especially in Ukraine related with the war conditions.

The relevance of the research is manifested in the rapid change in the ways HEIs promote their educational curricula, attract the attention of potential applicants and students, and cooperate with stakeholders. The key aspects of the research relevance are the following:

- Decision-making processes based on the precedents in order to understand situation especially under the war conditions;

- Competition in education: universities are competing for talented students, according to Hrynkevych et al. (2022), and digital transformation can become a strategic tool for advertising and disseminating their curricula and attracting the attention of their audience;



- **Marketing strategies:** digital technologies allow universities to engage more effectively with their audience through social media, email, websites, and other digital communication channels; the understanding of effective digital marketing strategies, such as those described by Shpak et al. (2023), can significantly improve the effectiveness of admission campaigns;

- **Educational technologies:** the use of digital tools to improve the educational process, as pointed out by Miroshnyk et al. (2022, 2023), including virtual classes, online courses, and interactive materials, can be an important aspect of a marketing strategy aimed at ensuring the high quality of education of HEIs;

- **Student engagement:** young people today are actively using digital platforms and effectively interact with them through digital communication channels that can help attract students and create a positive image of the HEI;

- **Data analytics:** the use of analytics and big data can help HEIs to better understand their audience, predict trends in education, and adapt their marketing strategies to achieve better results;

- **Global market:** HEIs are influenced by global trends (Stepura and Kuzmak, 2023) and the digital transformation of marketing will accelerate interaction with the multinational education market, expanding opportunities for international cooperation and attracting students from different countries.

2. Literature Review

The applications of basic marketing principles to promote education and HEIs date back to the 1970s in the United States (Krachenberg, 1972). Even at that time, Professor of Business Administration A. R. Krachenberg from the University of Michigan (Michigan-Deaborn) emphasized that marketing as a core operational activity in higher education institutions was underestimated. After 50 years, this topic remains relevant and is actively researched both in a historical overview (Elken, 2020) and practical application. For example, it concerns determining the marketing strategy of a HEI in connection with the market restructuring of an educational institution as suggested by Gajić (2012), recruiting students for the first year of study at private universities according to the research of Alhakimi and Qasem (2014), analyzing marketing tools to increase the brand awareness of a university (Stukalina, 2019), applying the concept of marketing communication mix by Kotler and Keller's innovation (2012), its advantages and disadvantages, comparing the marketing impact of traditional advertising, online advertising, and relational marketing on the choice of higher education students by Angulo-Ruiz et al. (2016).

At the same time, the emphasis on digital marketing is a separate area of scientific research, for example, in the works of Dhote et al. (2015), Barus (2023), Kusumawati (2019), Mishina and Pace (2021), and Noerlina and Mur-

sitama (2022). The use of digital tools for the promotion of higher education institutions is researched by types: social media (Biczysko and Jabłońska, 2016; Mazurek et al., 2019; Perera et al., 2023), e-marketing (Štefko et al., 2015), Internet marketing (Alkhas, 2011; Ziyadin and Serikbek, 2020), as well as research on comparing traditional and digital marketing conducted by Mammadova (2023) and Daj and Chirca (2009), the impact of the technological revolution and industry 4.0 on digital marketing in higher education analyzed by Nair and Kumar (2021).

In terms of geography, digital marketing research covers different countries and continents, both developed and poor ones: Canada, France, Sweden (Angulo-Ruiz et al., 2016), Sri Lanka, Vietnam (Perera et al., 2023), Ghana (Alhakimi and Qasem, 2014), India (Dhote et al., 2015), Indonesia (Kusumawati, 2019), Slovakia (Štefko et al., 2015), the United States (Alkhas, 2011), etc.

The review of the literature on digital marketing studies of HEIs in Ukraine, Poland, and the Czech Republic is characterized by a strong scientific contribution to Poland (Biczysko and Jabłońska, 2016; Kisiołek, 2015; Mazurek et al., 2019). The topic of DTM in the Czech Republic is represented by various publications (Chmelařová, 2018; Civelek et al., 2020; Eger et al., 2021; Juříková, 2019) with a focus on marketing communications and online marketing in educational institutions. In Ukraine, the issues of digital marketing development, particularly in higher education institutions, are also actively researched by Panchuk and Kononova (2023), Kraus et al. (2021), and Lysytsya et al. (2017). However, the range of problems of the DTM research by three countries has not yet been fully disclosed, such as Ukraine has faced the huge negative impact of the large-scale Russian invasion from the 2022. It is valuable for science to analyze the views of university staff and their vision of the future development of digital marketing in the context of international comparisons.

In order to enhance the conceptual basis of digital transformation (DT) from the higher education institutions framework side, it is important to distinguish it from simple digitalization. While digitalization refers to the application of digital tools to existing processes, digital transformation provides broader organizational transformation, influencing changes in culture, structure, strategy, and educational spheres (Vial, 2019). In the context of HEIs, such kind of the transformation influences technological infrastructure and pedagogical methods, stakeholder engagement, and governance models as well (Selwyn, 2019).

Under the wartime condition Ukrainian HEIs are forced to accelerate digital transformation, often by overcoming traditional resistance and budgetary constraints (UNDP, 2024). Also, Mrykhina et al. (2024) argue that interdisciplinary learning supported by digital tools plays a critical role in preserving educational quality during wartime. Their findings emphasize the effectiveness of integrating online platforms in HEIs to maintain conti-

nunity of instruction, cross-border academic collaboration, and flexible curriculum delivery. Similarly, Lysytsya et al. (2017) pointed out that digital communication tools allow academic institutions to sustain reputational presence and outreach even when physical infrastructure is disrupted. The case of Ukrainian HEIs supports this view, where students, junior faculty, and IT staff initiated digital shifts out of immediate necessity, not long-term strategic planning.

Beyond Ukraine, several studies show how HEIs globally have redefined their strategic priorities due to crises. For instance, Crawford et al. (2020) documented responses of 20 countries' HEIs to the COVID-19 pandemic, finding that emergency digital transformation often impacts long-term organizational change. In the Ukrainian case, however, the drivers go beyond health safety – they include migration, infrastructure destruction, psychological stress, and geopolitical displacement of entire educational systems.

Moreover, the war has demonstrated how digital transformation intersects with digital inequality issues. Veletianos and Houlden (2019) pointed out that crises magnify disparities in access to connectivity, devices, and support structures. In Ukraine, the Ministry of Digital Transformation addressed this through national-scale initiatives like Diia. Digital Education (2025), which became a foundation for upskilling both students and educators during the war. Also, Zawacki-Richter et al. (2019) highlight the potential of artificial intelligence and learning analytics in maintaining student engagement during unstable periods. During literature analyses of digital transformation in education and the impact of war on it was found that the scientific fundamental papers of Kaplia et al. (2024), Prykhodko et al. (2025), and Ramskyi (2023) are addressed to establish such links.

Separately, the authors would like to emphasize the research methods and results obtained by other authors. A typical practice for evaluating marketing activities and advertising of HEIs is to survey students, for example, 936 people from Sri Lanka and Vietnam who were university students and had at least one profile on social networks (Perera et al., 2023) to identify the relationship between marketing, the HEI brand, and the intercultural characteristics of these countries; Štefko et al. (2015) present a survey of the opinions of 400 students regarding the overall image of the faculty and the evaluation of individual elements of the faculty's website; based on surveys of the students studying in large private universities in Northern India, Kaushal et al. (2023) a relationship between the determinants of university reputation and the perception of education quality is found. In addition to online surveys, effective research methods include semi-structured in-depth interviews of students from India, Great Britain, Nigeria, and the UAE (Jain et al., 2022), online questionnaires combined with semi-structured interviews of heads of higher education institutions in Japan (Comai, 2023), in-depth inter-

views with chancellors and vice-chancellors of Greek universities (Makrydakis, 2021).

Thus, placing digital transformation within the wartime condition deepens our understanding of HEIs not just as adopters of innovation, but also as actors of resilience, leveraging digital tools to preserve institutional functions and support displaced communities under unpredictable conditions.

Aims of the Research

The research aims to assess the status and prospects of the development of DTM in HEIs in Poland, the Czech Republic, and Ukraine in the shadow of war, namely:

- To define the main directions of DTM based on the results of expert surveys of HEI staff;
- To confirm or deny the hypotheses on the consistency of views of experts from Poland, Ukraine, and the Czech Republic regarding the most important areas of digital marketing for HEIs in the coming years, especially under wartime; barriers to DTM; the characteristics of the DTM development; attitudes towards the DTM by HEI employees;
- To confirm or deny the hypothesis of differences in experts' views on DTM depending on the form of the HEI ownership.

3. Methods

The research on the DTM of HEIs is based on the results of a respondent survey conducted in 2022. The respondents (experts) were employees of HEIs, namely vice-rectors, heads of departments, secretaries of admission committees, and employees of the Departments of Marketing, Management, and Media Communication.

The employees of 207 HEIs from 3 countries participated in the online survey: Poland, Ukraine, and the Czech Republic, both public and private.

The article analyses the answers to the following questions:

- Which area of digital marketing do you consider to be the most important for the decision-making process under uncertainties in your higher education institution in the coming years (select one or more options from the list)?
- What barriers do you see in the digital transformation of marketing at your higher education institution (select one or more options from the list)?
- Confirm or deny the following statements on the characteristics of the development of DTM (select “yes” or “no” from the list of statements).
- How do you assess the attitude to the digital transformation of marketing by the HEI management, marketing staff, teachers, and students (rate from 1 to 6 (1 – very negative; 6 – very positive))?

Of the 207 questionnaires sent out, 166 were suitable for further statistical analysis, as the rest were unsuitable due to duplicate responses and the absence of responses.

The number of questionnaires by country in terms of structure is the following: Poland – 74%, Ukraine – 21%, and the Czech Republic – 5%; by form of ownership: public – 60%, private – 17%, and unidentified – 23%. A database of respondents' answers from each country was created and statistically analyzed in Microsoft Excel 2023 (Microsoft Corporation, Redmond, WA, USA) spreadsheet editor.

Spearman's rank correlation coefficient (Spearman, 1904) was used to identify the correlation between the experts' answers depending on the form of ownership and the country of the HEI location.

The peculiarity of the obtained questionnaire data is that they reflect the qualitative characteristics of the object (namely, the experts' answers, most of which are “yes” or “no”, as well as the ordinal assignment of subjective impressions to the questionnaire). Their mathematical processing requires the use of somewhat specific calculation methods. To estimate the density of the relationship of non-parametric variables, the following coefficients are commonly used: Fisher's coefficient (Berger et al., 2018), Spearman's rank correlation coefficient (Spearman, 1904), Kendall rank correlation coefficient (Kendall, 1938), Yule's Q coefficient of association (Yule, 1912).

Having regard to the features of the obtained database of experts' responses (namely, the inconsistency of the data for the use of typical parametric methods of identifying the relationship between variables, as well as the possibility of using an ordinal scale for measuring results), it was decided to use Spearman's rank correlation coefficient.

Spearman's rank correlation coefficient (ρ) is a statistical indicator used to measure the degree of linear dependence between two qualitative variables. The main advantages of using this coefficient are as follows:

- Independence on the distribution of variables: Spearman's rank correlation coefficient is a non-parametric measure, which means that it does not impose any specific requirements on the distribution of variables; this makes it more flexible than parametric methods such as Pearson or Fechner correlation coefficients;

- Consideration of data order: Spearman's coefficient uses ranks rather than direct values of variables; this means that it takes into account the order of values, but not their specific numerical values;

- No requirement for a normal distribution law: Spearman's coefficient does not require that variables have a normal distribution; this is especially important when data do not meet the conditions of parametric methods;

- Less sensitive to anomalous data and outliers: since Spearman's coefficient uses ranks, it is less sensitive to outliers and eliminations than the Pearson correlation coefficient; this makes it more robust to anomalies in the data;

- Spearman's correlation coefficient takes values from -1 to 1 , if $\rho = 1$ there is a direct relationship, and if $\rho = -1$ there is an inverse relationship (Spearman, 1904).

The calculation algorithm consisted of the following iterations:

1. Ranks (r_1 , r_2) were assigned to each domain of the digital marketing (DM) based on the aggregated answers to the questionnaire. The calculation was performed in Microsoft Excel. The ranking was performed using the RANK function. The numbers of the corresponding items are arranged in ascending order.

2. Calculation of Spearman's correlation coefficient (ρ) according to the formula (Spearman, 1904):

$$\rho = 1 - \frac{6 * \sum_{i=1}^n (r_{1i} - r_{2i})^2}{n^3 - n}$$

where r_{1i} , r_{2i} are the ranks of the i -sphere of digital marketing, depending on the form of ownership; n is the number of areas of digital marketing.

The relationship between experts' answers can be considered statistically significant if the value of Spearman's rank correlation coefficient is greater than 0.5 .

The syntax of the RANK formula in Microsoft Excel: = RANK (A2;\$A\$2:\$A\$10;1), where A2 is the cell that contains the element whose rank must be determined; \$A\$2:\$A\$10 – a range of cells containing all aspects of the researched samples; 1 – indicating that the ranking of elements is performed in ascending order.

3. Checking for significance using the critical values of Spearman's rank correlation coefficient for a given number of observations n .

4. Acceptance of the hypothesis.

That is, mainly to identify the effectiveness of marketing measures, students of selected higher education institutions participate in research, less often – employees. This is explained by the scale of a survey (there are always more students than employees) and the simplicity of information collection (it is easier to get answers from students than from employees). The authors believe that the survey of employees of HEIs is more informative for collecting data from within educational organizations because this information is obtained from managers who make management decisions regarding marketing activities, plan development vectors of DTM, and make appropriate decisions. The survey of the employees of HEIs makes it possible to outline existing problems and potential opportunities of DTM, identify the most important areas of digital marketing, barriers of DTM, the involvement of third-party organizations in branding and advertising of DTM, and the attitude of stakeholders to HEIs and DTM.

The insignificant share of responses received from private HEIs is caused by their high level of privacy, which makes it difficult to obtain information and communication. At the same time, the authors consider this an opportunity to expand cooperation and further interaction with private

Table 1. Number of Internet and social media users as of 1 January 2024 by country.

Indicator	Ukraine	Czech Republic	Poland
Population, million people	37.42	10.50	40.57
Aged 13–17	5.9	5.5	5.3
Aged 18–24	4.4	6.7	7.7
Aged 25–34	9.7	11.4	13.7
Internet users	79.2	92.8	88.1
Active users of social media, total	64.9	76.7	68.8
Facebook	37.0	44.8	48.3
YouTube	64.9	76.7	78.0
Instagram	33.1	34.3	27.1
TikTok	53.9	24.5	34.7
X users	12.2	18.1	14.3

Source: systematized by the authors according to Kemp (2024a, 2024c, 2024d): Ukraine, Czech Republic, Poland.

universities, which requires additional time and future scientific research.

4. Results

This section presents the results of the statistical analysis of the status and prospects of the DTM development by country and form of ownership, as well as the interconnectedness of the consistency of views on DTM among experts from Poland, Ukraine, and the Czech Republic using Spearman's rank correlation coefficient.

Digital marketing is a strategy for promoting goods or services through digital technologies and online communication channels. It encompasses the use of a wide range of digital tools and platforms, such as websites, social media, email, search engine optimization, content marketing, video marketing, etc.

The data in Table 1 confirm the development and popularity of digital technologies in these countries, taking into account the share of young people who are potential applicants and future students of HEIs. The number of active social media users and their choice of a particular social network indicates the main areas of promotion and advertising that HEIs can use in DTM.

The extent of the spread and use of digital technologies in the surveyed countries is shown in Table 1.

Below are the results of a questionnaire survey of HEI staff on their vision of digital marketing development.

Fig. 1 visualizes the differences in assessment of the importance of digital marketing by experts from Poland, Ukraine, and the Czech Republic.

There is an unequivocal response from experts in identifying the most important area of DM for HEIs – SMM. 78.9% of the respondents in general believe so, with the highest number of respondents in Ukraine – 91.4%, which means that under war conditions the necessity in digital technologies became more crucial. Internet public relations (PR) and influencer marketing are in second place. Mobile

marketing is in the top three. Having regard to the global development of social networks and their integration into the daily life of the population, the authors consider such answers to be consistent and effective in informing and attracting potential applicants and students to higher education institutions.

According to the survey results, email marketing is the least popular DM tool. One of the reasons why email is not always the most popular tool for advertising and promoting HEIs is the low open rate (with a large number of promotional messages that users receive in their inboxes every day, the open rate of email can be very low; many messages can end up in the “Spam” folder or be ignored). Successful email marketing requires personalizing messages for each recipient. Many HEIs may have limited tools and capabilities to personalize massive email lists effectively. In today's world, there are many alternative communication channels, such as social media, websites, chatbots, etc., which are more popular among young people and potential students.

The most significant differences in experts' opinions by country are observed in determining the importance of Search Engine Optimization (SEO) (65.7% relevance in Ukraine, and no more than 33% in the other two countries) and paid links (considered one of the most important areas in the Czech Republic by 44.4% of respondents). This difference in opinions can be partly explained by the cost of using these areas of DM: HEIs in Ukraine are not ready to spend money on the paid promotion of their advertising. In the Czech Republic and Poland, the financial possibilities allow HEIs to use such tools much wider.

HEIs in Ukraine are generally more active in the use of DM. The authors believe that one of the reasons for this is the full-scale invasion of Ukraine by Russia and, as a result, a significant number of people, especially young people, moved abroad. As of June 2024, the United Nations High Commissioner for Refugees (UNHCR) reports 6.739 million refugees from Ukraine, including 6.168 million in

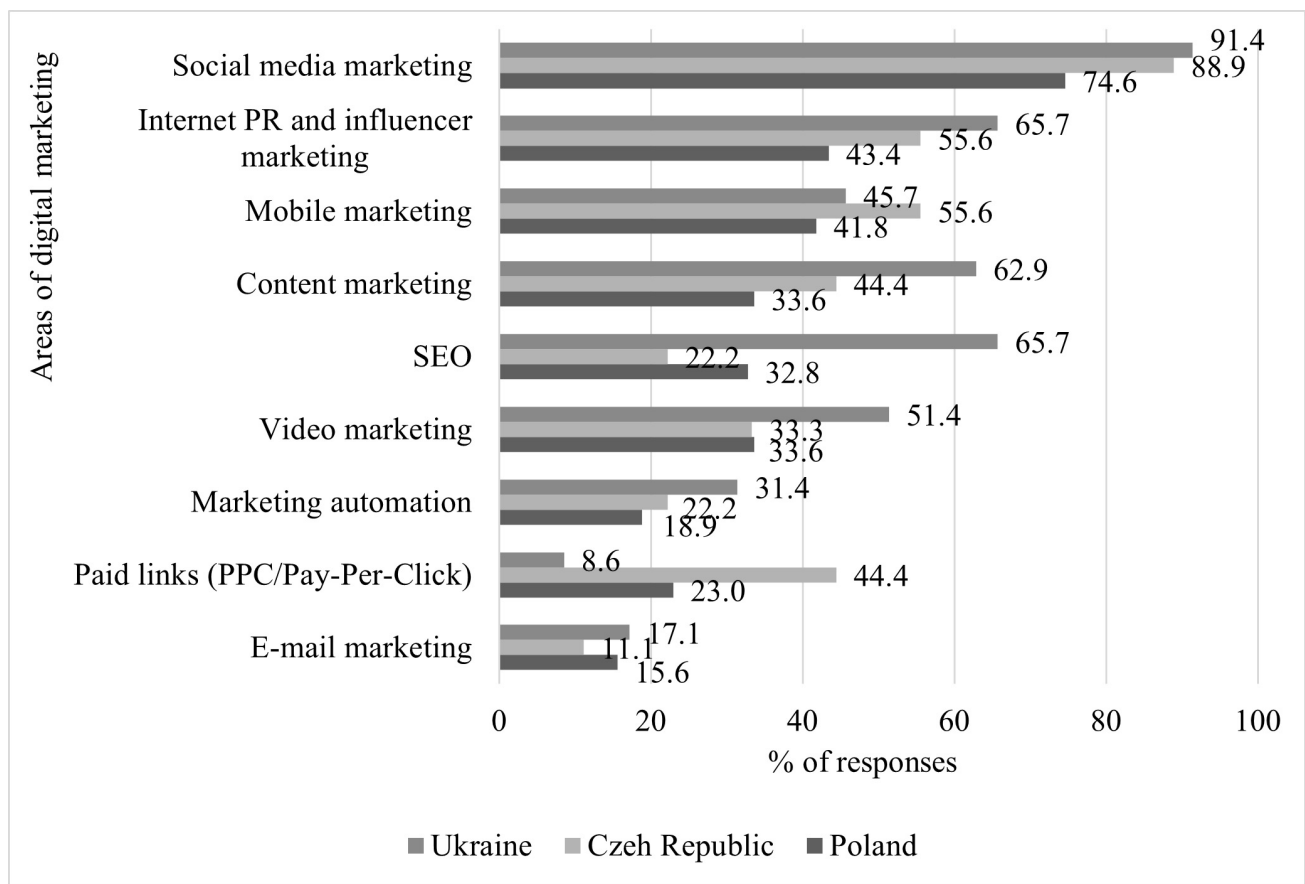


Fig. 1. Aggregated answers of experts to the question: “What do you consider to be the most important area of digital marketing for higher education institutions in the coming years?” by country. Note: Multiple answers were available. Source: developed and compiled by the author’s survey. PR, Public Relations; SEO, Search Engine Optimization.

Europe ([United Nations High Commissioner for Refugees, 2024](#)). Therefore, the only way to inform them is digital marketing tools.

To sum up, the percentage of digital technology usage in almost all areas was the highest in Ukraine. It can be explained by war condition, where most higher institutions have moved into online or hybrid format activity (lectures, public activities and decisions making in the groups). Let the authors analyze the difference in responses among experts from public and private HEIs (Fig. 2).

Public HEIs actively use those areas of DM that offer free functionality, while private HEIs are ready to use paid PPC/Pay-Per-Click tools more.

One of the main problems of DTM lies in a marketing budget being too small, as acknowledged by experts from three countries. The other answers vary from country to country (Fig. 3).

In 9 out of 13 positions by type of barrier, Ukraine is a leader in terms of share of responses, which means that there is a significant variation in the problems for DTM, the most acute of which is financial, a lack of separate positions for specialists and, what is worth noting, the inconsistency of the measures taken. Solving financial problems

does not fully depend on the HEI while establishing an internal strategy for the development of DTM and systematic implementation is within the competence and authority of the HEI management. It is necessary to point out the action-targeted nature of the activities taken in Ukraine is 51.4%. This can be explained by the fact that from the beginning of the war it was necessary to provide normal online learning processes for students. Managers of higher education institutions faced the problem of rapidly shifting from normal activities to online operations, especially in 2022–2023. Moreover, the Ukrainian higher education system suffered from unexpected power outages and Internet connection disruptions due to attacks on Ukraine’s energy infrastructure. In this case, it was complicated to plan some activities related to involve main stakeholders into the marketing activities of HEIs even online. Also, Ukrainian public higher education system is under financing restrictions, which means marketing expenses could not fully covered that can be explained that facts that government reconsidered budget money into the military activities for Russian invasion resistance. It enhances the problems to make autonomous decisions by governmental institutions. What is very important is that Ukrainian HEIs have a few problems

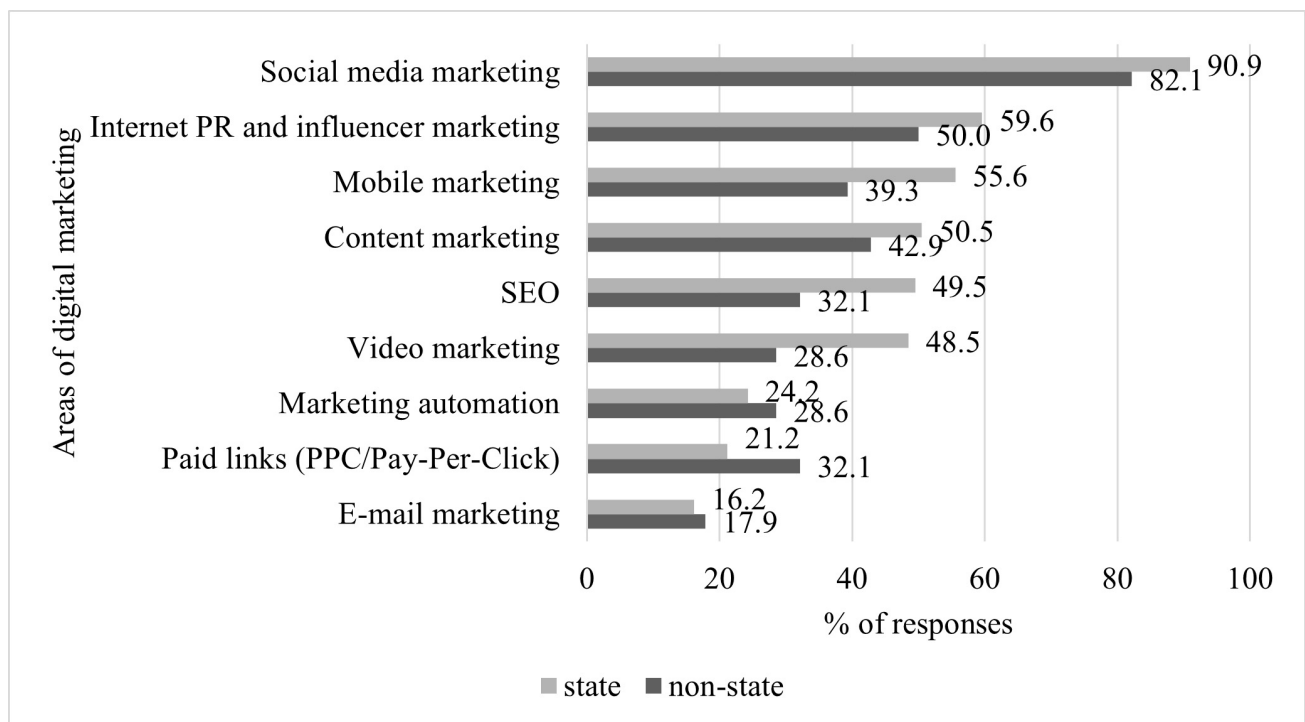


Fig. 2. Aggregated answers of experts to the question: “Which area of digital marketing do you consider to be the most important for higher education institutions in the coming years?” by type of ownership of the HEI. Note: Multiple answers were available. Source: developed and compiled by the author’s survey. HEI, higher education institution.

related to a lack of vision of DTM, i.e., managers and staff understand the vector of development of digital marketing of their institutions and only need to organize its proper implementation. Important barriers in Czech HEIs are a lack of separate positions for DM specialists, a lack of coordination of activities of different departments, and different age of employees, i.e. organizational rather than financial problems and obstacles in DTM are prevalent. A third of the respondents pointed to the lack of vision of DTM. The main barrier for Polish HEIs is in the fact that a marketing budget is too small, but at the same time there is a set of organizational problems: a lack of coordination, fragmented decision-making, and too little flexibility in the organizational structure.

The analysis of the questionnaire responses depending on the form of ownership indicates that the obstacles in public HEIs are much higher than in private ones (see Fig. 4). The most considerable structural difference concerns the fact that the marketing budget is too small (23.3 percentage points) and a lack of coordination of structural departments (23.0 percentage points). Whereas, the problems of instability, constant organizational changes, and a lack of an informatization strategy in the field of marketing do not depend too much on the type of ownership of the HEI (difference of 5–6 percentage points).

The visualization of the consistency of experts’ views on the main characteristics of DTM is shown in Fig. 5.

We can see a significant difference in the answers of HEI staff from Ukraine compared to their colleagues from Poland and the Czech Republic. More than 90% of Ukrainian experts say that DTM requires new competencies, knowledge, and skills. There is a +19 percentage point difference in the answers on the increasing importance of the role of marketing in Ukrainian HEIs, which may indicate an increased understanding of the role of DTM in education, while in Poland and the Czech Republic, this stage of DTM development has moved to the phase of active implementation. This is evidenced by the answers to the question on the allocation of funds for online activities: 17.1% of affirmative responses from Ukrainian HEIs, 66.7% and 50.8% from Czech and Polish colleagues respectively; the % of responses on the creation of new positions by country also confirms this assumption.

DTM has had a significant impact on both public and private HEIs (Fig. 6). In public institutions, this impact is more appreciable in most characteristics, except for funding. More than 75% of the respondents agree that the development of digital marketing requires new competencies, knowledge, and skills, with only 10–12% of respondents believing that they are difficult to overcome, and this concerns both public and private HEIs.

Table 2 shows the general assessment judgments of employees on the attitude towards DTM by country and type of HEI ownership, as well as central trends of the sample: mode, median, and mean (overall).

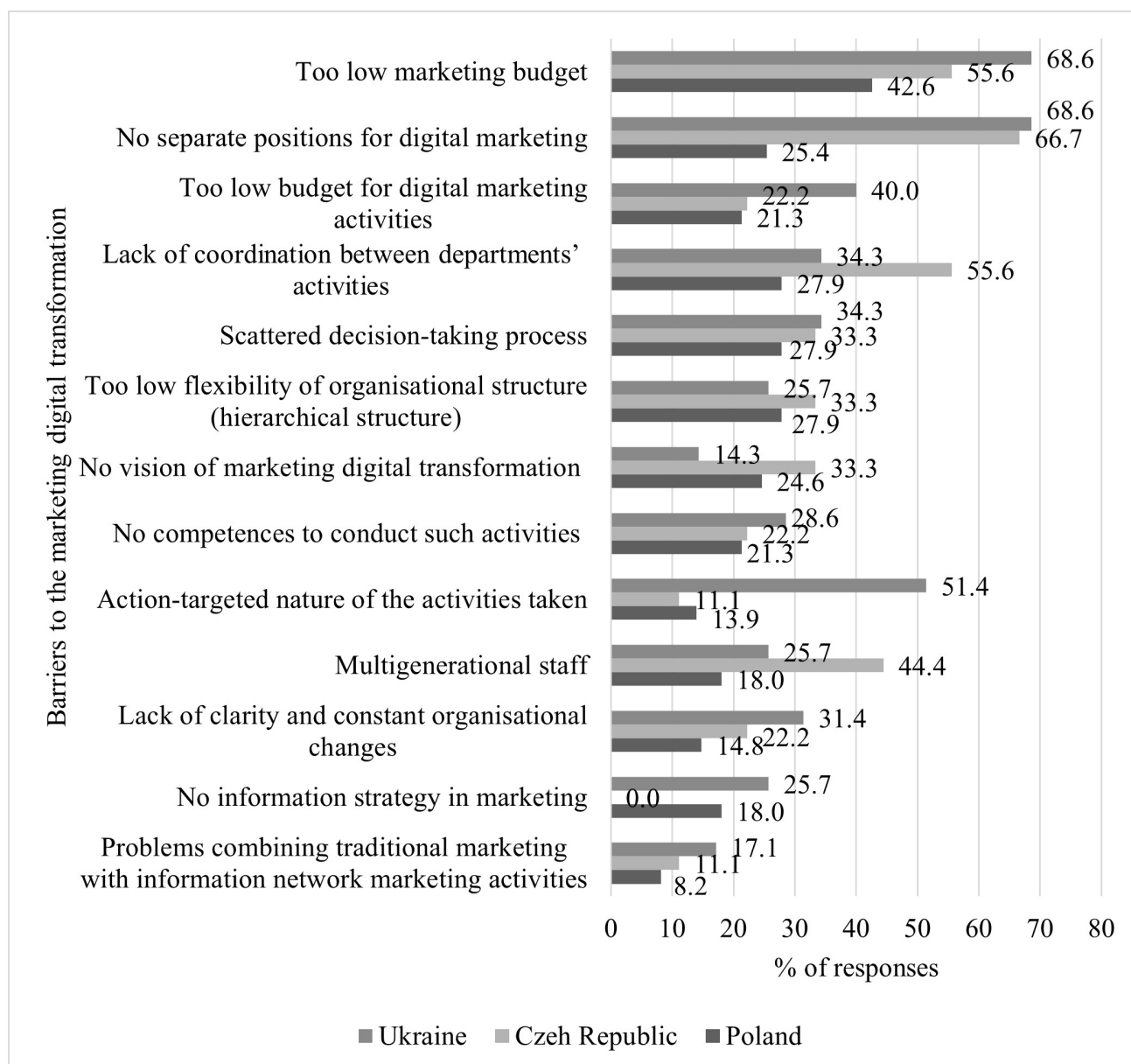


Fig. 3. Aggregated answers of experts to the question: “What barriers do you see in the digital transformation of marketing at your HEI?” by country. Note: multiple answers were available. Source: developed and compiled by the author’s survey.

Table 2. How do you assess the attitude towards digital transformation of marketing?

Attitudes towards DTM by	Poland	Ukraine	Czech Republic	Public	Private	Overall	Mode	Median
	Mean							
Management of a higher education institution (points)	3.96	4.34	4.11	4.23	4.19	4.06	4	4
Marketing services employees of the higher education institution (points)	4.67	4.31	5.00	4.75	5.07	4.60	6	5
Teachers (points)	3.53	4.63	3.11	3.98	3.79	3.77	4	4
Students (points)	4.83	5.11	4.78	5.14	5.19	4.89	6	5

Note: 1 – very negative; 6 – very positive.

Source: developed and compiled by the authors’ survey.

It should be noted that the scores of experts from Ukraine are higher than the expected values in most cat-

egories (except for employees of marketing departments of HEIs, who may not be entirely satisfied with the funding

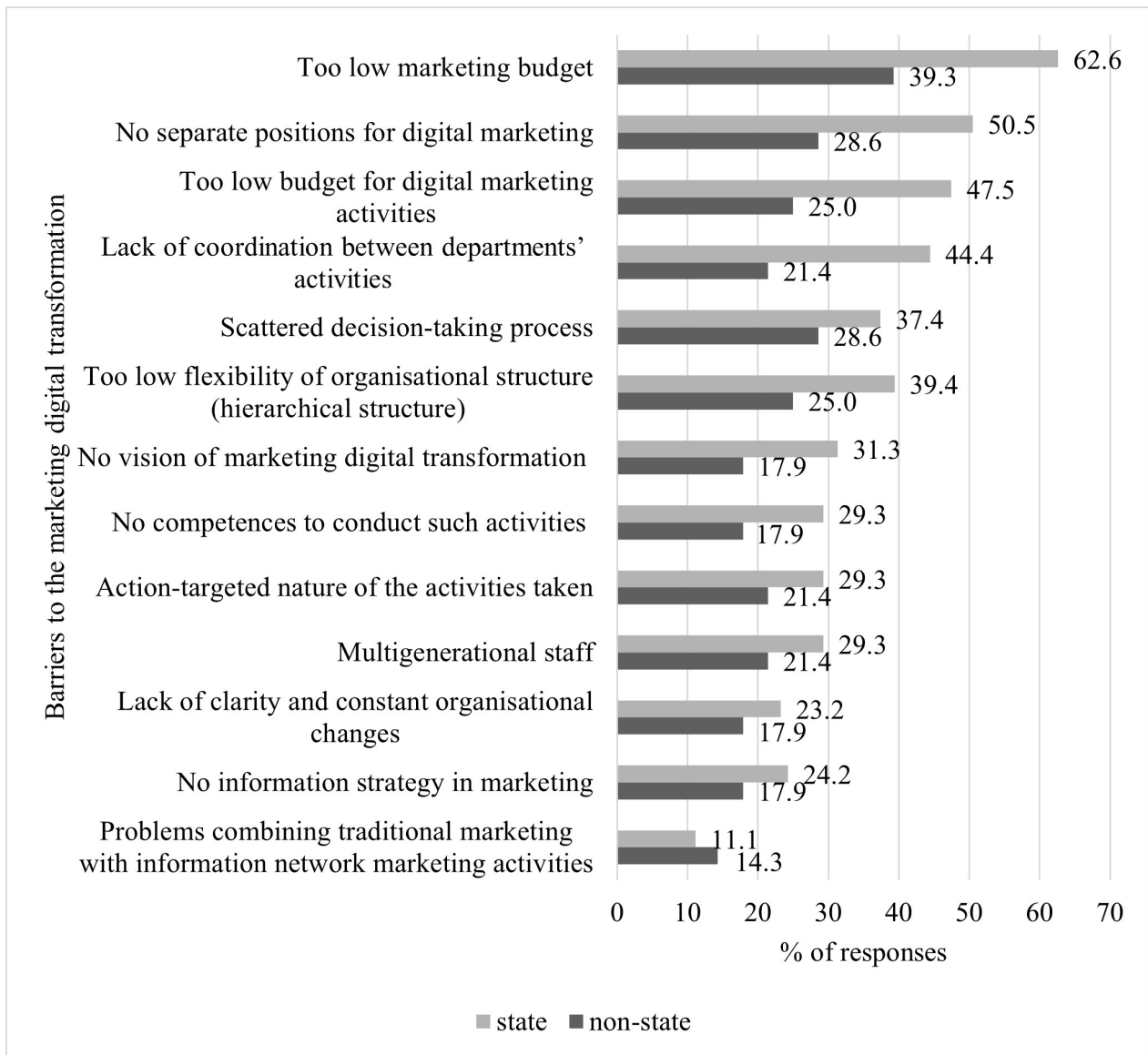


Fig. 4. Aggregated answers of experts to the question: “What barriers do you see in the digital transformation of marketing at your HEI?” by type of ownership of the HEI. Note: multiple answers were available. Source: developed and compiled by the author’s survey.

and organization of work within the HEI), i.e., Ukrainian HEIs have a very positive attitude towards changes in digital marketing, especially students (average score 5.114 out of 6). As for teachers’ expectations, Ukrainian HEIs also have the highest scores – 4.629 – the highest score by country. These results indicate a high level of digital literacy and Internet use among the Ukrainian population. According to new research by the United Nations Development Program (2024) of the all-Ukrainian survey implemented by the United Nations Development Program with the support of Sweden related to the war in 2023, number of people who use the Internet daily in Ukraine increased by 10%, and the number of people who started using the Internet increased by 5%. In Ukraine, 80% of people use the Internet daily, including 98% of people under 30 and 40% of people over

70. “A Ukrainian who wants to have digital skills can freely acquire them” is the motto of the Ministry of Digital Transformation of Ukraine, which launched the national online digital literacy platform “Diia. Digital Education. Digi-gram” (2024), where every citizen can learn and improve digital skills for free. Also, it was observed that during the war the necessity of usage such digital technologies have become more influential such as attending the institutions physically on some regions of Ukraine was too dangerous. Even though currently there are only online system learning of higher institution in Zaporizhzhia region. Also, there are the big number of Ukrainian students who have moved in abroad and they can attend the learning activities only online.

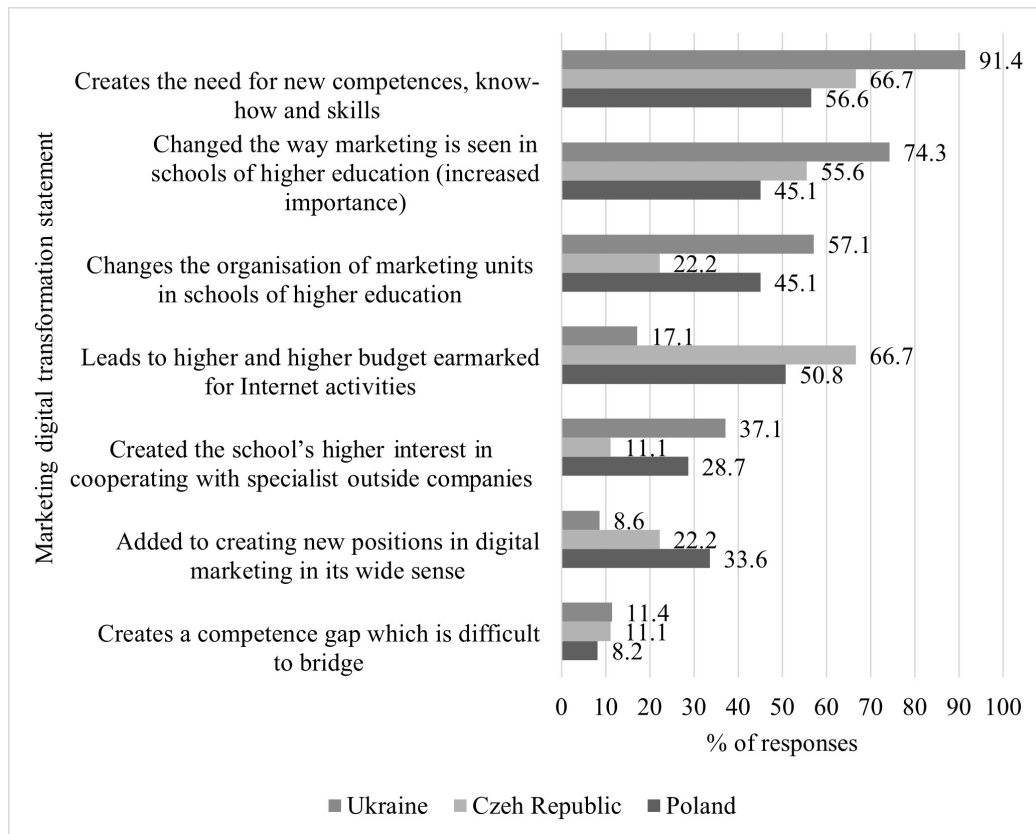


Fig. 5. Aggregated answers of experts to the question: “Confirm or deny the following statements on the characteristics of DTM” by country. Note: “yes” or “no” answers. Source: developed and compiled by the author’s survey. DTM, digital transformation of marketing.

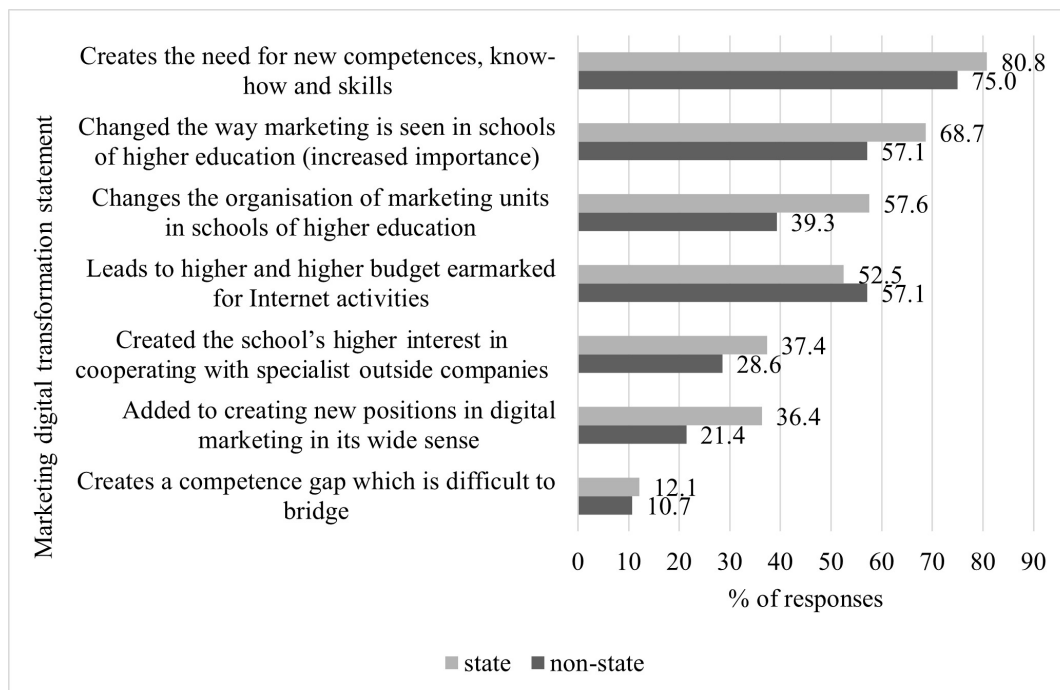


Fig. 6. Aggregated answers of experts to the question: “Confirm or deny the following statements on the characteristics of the DTM” by the form of ownership of the HEI. Note: answer options are “yes” or “no”. Source: developed and compiled by the author’s survey.

As for the attitudes of teachers and students towards DTM (according to the assessment of HEI staff), students have much higher scores and are the most inspiring drivers of DTM change, with almost no difference in the ownership of the HEI. This is confirmed by modal values of the attitudes of students and marketing staff, which are the highest at 6 points.

After analyzing the aggregated results of the survey, the authors will try to mathematically deny or confirm the existence of a relationship (dependence) between the consistency of experts' opinions on DTM and the geography of their countries of residence, as well as HEI ownership.

Two hypotheses are proposed for this purpose:

H0 – there is no statistically significant relationship between the questionnaire responses of experts (there is no consistency of experts' opinions on DTM depending on the country and the form of HEI ownership).

H1 – there is a statistically significant relationship between the experts' questionnaire responses (experts' opinions are consistent on DTM depending on the country and the form of HEI ownership).

The closeness, direction, and significance of the relationship were calculated using Spearman's rank correlation coefficient.

The number of observations $n = 9$ is calculated using the COUNT formula.

After substituting all the aspects of the formula, the authors got the figure that Calculated Spearman's $\rho = 0.9000$. That is, the relationship is statistically significant.

Checking for significance using the critical values of Spearman's rank correlation coefficient for a given number of observations n . There are low, sufficient, and high levels of statistical significance, which do not exceed 0.05 (5%), 0.01 (1%), and 0.001 (0.1%), respectively.

Table 3 shows an example of calculating the consistency of experts' opinions on the question: "What area of digital marketing do you consider the most important for a higher education institution in the coming years?" depending on the type of HEI ownership.

Thus, a high statistically significant correlation between the answers of experts of both public and private higher education institutions with an accuracy of up to 1% is revealed.

Acceptance of the hypothesis. According to the calculation results, hypothesis H1 is confirmed: there is a statistically significant substantial relationship (0.9000) between the questionnaire responses of experts regarding the most important area of DM for HEIs for the coming years, depending on the form of ownership of HEIs.

Table 4 presents the results of calculations of Spearman's rank correlation regarding the consistency of experts' opinions on other questionnaire issues, depending on the form of HEI ownership.

Similarly, we check the closeness and significance of the relationship of experts' answers, depending on the coun-

try of location of the higher education institution. The result is presented in Table 5.

5. Discussion

It is necessary to point out that this investigation is very crucial such as we have received and analyzed the results of HEIs from Poland, the Czech Republic, and Ukraine. The researchers have compared the results of such kind of analyses based on proposed method. But from other side, Ukraine is under the war condition and we can assume that there are hidden factors, which also can influence on the results of survey. But we can mention that conditions of the war influenced on the digital transformation of marketing of HEIs in Ukraine. It can also be useful for creation data base of the precedent's decisions, especially for Institutions that countries that could suffer from a war.

The war in Ukraine has introduced a unique and urgent context for digital transformation in higher education marketing (DTM) analysis. While digitalization has been a global trend (Mishina and Pace, 2021; Nair and Kumar, 2021), our findings demonstrate that under crisis conditions, particularly the war, digital transformation is not only accelerated but reshaped by necessity.

The findings of this study are consistent with prior research suggesting that digital transformation plays a critical role in shaping strategic communication and competitiveness among higher education institutions (Angulo-Ruiz et al., 2016; Barus, 2023).

Furthermore, while Vial (2019) discusses digital transformation largely in terms of infrastructure and technological capability, our results indicate that human factors – particularly internal perceptions of digital marketing and cultural readiness – are equally decisive.

While digital marketing is often discussed in strategic and competitive terms (Kotler and Keller, 2012), our research positions DTM as a mechanism for institutional continuity, societal stabilization, and psychological connection during war. Ukrainian HEIs have effectively used digital marketing not just for promotion, but for maintaining visibility, trust, and relational proximity with stakeholders under existential threat. Interestingly, Ukrainian institutions showed stronger alignment on the strategic vision of DTM than their peers in more stable environments. This supports the argument by Stepura and Kuzmak (2023) that crises can foster innovation and cohesion, especially when managerial structures are forced to become more flexible and responsive.

In the research, the authors received answers on the directions of DTM from employees of marketing services and managers of HEIs. However, these results have certain cautions and limitations due to the size and structure of the sample. The sample set of received answers, which are included in the analysis, by country is Poland – 122 questionnaires, Ukraine – 35 questionnaires, and the Czech Republic – 9 questionnaires. According to the information on the num-

Table 3. Calculation of Spearman's rank correlation for the question: "Which area of digital marketing do you consider the most important for higher education institutions in the coming years?"

Area of digital marketing	Form of the HEI ownership, % of affirmative answers		Ranks		$(r1_i - r2_i)^2$
	Public	Private	$r1$	$r2$	
SMM (Social Media Marketing)	90.9	82.1	9	9	0
Mobile marketing	55.6	39.3	7	6	1
Paid links (PPC/Pay-Per-Click)	21.2	32.1	2	4	4
Internet PR and influencer marketing	59.6	50.0	8	8	0
Email marketing	16.2	17.9	1	1	0
Marketing automation	24.2	28.6	3	2	1
Content marketing	50.5	42.9	6	7	1
Video marketing	48.5	28.6	4	2	4
SEO	49.5	32.1	5	4	1

Note: 1 is the lowest value; 9 is the highest value.

If calculated Spearman's $\rho <$ Critical value: the authors accept the hypothesis H_0 , otherwise – H_1 . In this case: Critical value (0.01) = 0.833 (0.783); Critical value = 0.700 (0.600). Source: calculated based on the results of the author's survey.

Table 4. Results of the calculation of Spearman's rank correlation and its significance test by individual issues of the questionnaire, depending on the form of ownership of HEIs.

What barriers do you see in the digital transformation of marketing at your higher education institution? ^A	
Calculated Spearman's ρ	0.861
Critical value (0.01)	0.703
Critical value (0.05)	0.560
The hypothesis is confirmed. H_1 : there is a statistically significant relationship between experts' questionnaire responses.	
Confirm or deny the statement on the characteristics of DTM ^A	
Calculated Spearman's ρ	0.937
Critical value (0.01)	0.929
Critical value (0.05)	0.786
The hypothesis is confirmed. H_1 : there is a statistically significant relationship between experts' questionnaire responses.	
How do you assess the attitude towards the digital transformation of marketing? ^B	
Calculated Spearman's ρ	0.943
Critical value (0.01)	1.000
Critical value (0.05)	0.886
The hypothesis is confirmed. H_1 : there is a statistically significant relationship between experts' questionnaire responses.	

Note: A – calculated based on % of responses; B – calculated based on the sum of the assigned grades of each gradation from 1 to 6.

Source: calculated based on the results of the author's survey.

ber of higher education institutions in these countries in the 2022/2023 academic year (European Commission 2024a, 2024b), State Statistics Service of Ukraine in 2020–2023 (Institutions of higher and professional pre-higher education, (2024): 426 (including 278 private) operated in Polish, 347 (including 144 private) in Ukrainian, and 54 (including 26 private) in Czech higher education institutions. That is, our sample size is 29%, 10%, and 17%, respectively, by country. The total distribution of public and private HEIs in these countries is 379 public institutions and 448 private institutions (44% and 56%, respectively). The distribution of questionnaires in the research: 78% – public higher education institutions and 22% – private ones. The insignificant share of responses received from private higher education institutions is due to the high level of privacy of these higher education institutions, which makes it difficult to ob-

tain information and communication. At the same time, the authors consider this an opportunity to expand cooperation and further interaction with private universities, which requires additional time and future scientific research.

A key finding of our study is the exceptionally high prioritization of social media marketing (SMM) by Ukrainian HEIs (91.4%) compared to 74.6% and 88.9% in Poland and the Czech Republic, respectively. It is also necessary to point out that war acted as a digital catalyst, a concept previously explored in the context of COVID-19 pandemic (Polishchuk et al., 2022), but underexamined in wartime conditions. Our data confirm that institutional survival under conflict necessitates a shift to digital platforms, especially for communication with displaced students and maintaining academic continuity.

Table 5. Results of calculating Spearman's rank correlation and its significance test by individual questions of the questionnaire, depending on the country of HEI location.

What area of digital marketing do you consider to be the most important for a higher education institution in the coming years? ^A			
Indicators	Poland–Ukraine	Poland–Czech Republic	Ukraine–Czech Republic
Calculated Spearman's ρ	0.765	0.903	0.491
Critical value (0.01)	0.833	0.833	0.833
Critical value (0.05)	0.700	0.700	0.700
The hypothesis is confirmed	H1	H1	H0
What barriers do you see in the digital transformation of marketing at your higher education institution? ^A			
Calculated Spearman's ρ	0.346	0.747	0.374
Critical value (0.01)	0.703	0.703	0.703
Critical value (0.05)	0.560	0.560	0.560
The hypothesis is confirmed.	H0	H1	H0
Confirm or deny the statement on the characteristics of DTM ^A			
Calculated Spearman's ρ	0.631	0.954	0.477
Critical value (0.01)	0.929	0.929	0.929
Critical value (0.05)	0.786	0.786	0.786
The hypothesis is confirmed.	H0	H1	H0
How do you assess the attitude towards the digital transformation of marketing? ^B			
Calculated Spearman's ρ	0.985	0.600	0.578
Critical value (0.01)	1.000	1.000	1.000
Critical value (0.05)	0.886	0.886	0.886
The hypothesis is confirmed.	H1	H0	H0

Note: A – calculated based on % of responses; B – calculated based on the sum of the assigned grades of each gradation from 1 to 6.

Source: calculated based on the results of the author's survey.

Moreover, the widespread usage of the mobile marketing, influencer's campaigns, and online public relations reflects an adaptation to the fragmentation of traditional institutional communication channels in Ukraine. These results resonate with Comai (2023), who pointed out that under systemic disruption, HEIs tend to externalize and decentralize their marketing efforts to reach mobile, digitally native audiences.

The findings contribute to a broader understanding of crisis-driven digital innovation in educational management. They also offer valuable precedents for HEIs across the European Union (EU) that may face other forms of instability in the future – be it political unrest, migration, or cyber threats.

To sum up, the war context reframes digital transformation from an optional modernization tool into a critical infrastructure of educational resilience. The Ukrainian experience underscores that institutional agility, rather than resources alone, determines the capacity to adapt and survive.

6. Conclusion

Based on the investigation's results, we can mention that the areas of digital marketing that employees of HEIs consider the most important for the coming years are determined by: SMM (78.9% of the respondents), Internet PR and influencer marketing (48.8%), and mobile marketing

(43.4%). It is revealed that, according to the employees of HEIs, students rate the digital development of their educational institutions higher and more optimistically (4.9 out of 6 points) than employees of marketing services, managers, and teachers (3.8 out of 6 points). The ownership form of HEIs does not significantly affect the vision of their employees regarding the status and prospects for the development of DTM. A close correlation is confirmed between the answers of experts working in public and private HEIs (Spearman's rank correlation coefficient is statistically significant and ranges from 0.86 to 0.94 for individual questions of the questionnaire).

Differences in the interpretation of DTM by country are partly caused by different rates of digital development and legislative initiatives. The EU states have a common vision of digital development of the EU by 2030 (European Commission, 2021), while in Ukraine such experience is just being implemented (Concept of Development of Digital Competences, 2021). It means that, there were some obstacles to align the digital transformation process under the war conditions. But, from the other side the results of the investigations have shown a higher percentage of usage digital technologies and Internet in Ukraine. It was explained the impact of the war and impossibility to work as usual. The managers of HEIs and students faced to the different issues related with communications, attendance the higher institutions physically such as suffer from fears. In

this case, most Ukrainian HEIs have moved into online and hybrid communications, which was impossible without digital technologies. It is necessary to point out that there are higher institutions, which work in online format currently in some regions close to Russia.

Therefore, the research results indicate the importance of DTM for HEIs. Each country and its HEIs have their own vision for the development of DM to attract students and popularize educational services. The results of this investigation are really crucial even for the managers of the higher education institutions of EU. The Ukrainian experience has presented the awareness the situation under war conditions that can be as the precedents for the future decision-making process by HEIs of EU under conditions of uncertainty.

Availability of Data and Materials

The data belongs to Lviv Polytechnic National University, Greater Poland Academy of Social and Economic Sciences in Środa Wielkopolska – Academy of Applied Sciences, Czestochowa University of Technology, Moravian Business College Olomouc, and the data-sharing agreement does not provide for its public disclosure.

Author Contributions

OKar, AK, PK, AP collected data and formulated research hypotheses. OKor developed method, analyzed data. MA designed the research study, review, and editing. OKor and MA drafted the manuscript. All authors contributed to critical revision of the manuscript for important intellectual content. All authors read and approved the final manuscript. All authors have participated sufficiently in the work and agreed to be accountable for all aspects of the work.

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Conflicts of Interest

The authors declare no conflicts of interest.

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