DIGITAL TECHNOLOGIES AS A REASON AND TOOL FOR DYNAMIC TRANSFORMATION OF TERRITORY MARKETING

Purpose. To develop a mathematical approach to quantitative assessment of the effectiveness of digital marketing of territories. To determine the tasks of digital marketing of territories and directions for increasing its effectiveness.

Methods. The research used scientific and methodological methods: content analysis to substantiate the use of quantitative indicators for evaluating marketing effectiveness; induction and deduction for the development of a mathematical approach to evaluating the effectiveness of digital marketing of territories; analysis and synthesis to coordinate projects under conditions of a dynamic transformation of marketing processes.

Findings. The mathematical formalization of quantitative evaluation effectiveness of marketing territories is developed, provided that the possibility of implementing project approach and conditions for coordination of projects is ensured. The tasks to be solved by the digital marketing of territories and directions for increasing its effectiveness are defined, and its advantages are detailed. The scheme is proposed for the implementation of territory marketing, taking into account the direct impact of information tools on the result and the reverse impact of an inappropriate result on the choice of information tools, which dictates the need to ensure the adaptability of marketing to dynamic changes in external and internal influences.

Originality. The synergistic mutual influence of territory marketing and digital technologies, the synergistic mutual influence of business activities in the territorial location and the marketing of territories is established. It is established that the factor that determines the dynamic change in marketing plans is also a significant level of uncertainty due to the dynamic change in the level of threats and the dynamic nature of the introduction of the latest technologies.

Practical value. The mathematical approach to quantitative assessment effectiveness of digital marketing territories and the determination of its tasks and directions for increasing efficiency determine the practical value of the study.

Keywords: marketing activity, territory marketing, marketing strategy, digitalization

Introduction. The dynamic nature of challenges and threats to the socio-economic development of the regions of Ukraine requires the development of dynamic tools for their leveling. Such tools are provided by the development and introduction into use, including the mass use of digital technologies. The mass use of the latest devices in production and everyday life creates an environment favorable for the spread of the use of these devices in other areas.

At the same time, the rapid development of modern technologies necessitates rapid changes in all spheres of social and economic activity. Therefore, only a significant level of adaptability of established practices will ensure the appropriate level of competitiveness of collectives and communities in the spheres and industries where the specified practices were applied.

Under the conditions of digital transformation of all spheres of activity, the concept of territory marketing is also transformed, which causes the emergence of a new type of marketing — digital marketing. Digital marketing means not only and not so much the formation of the brand of the territory through the use of digital communication tools. In fact, digital technologies lead to a change in the concept of traditional marketing of territorial locations. These technologies also create new opportunities for the implementation of integrated strategic development of territories. What was previously considered a disadvantage and led to the neglect of certain locations becomes an attractive brand and creates prerequisites for development due to the use of the latest methods and communication technologies. In general, the marketing of territories becomes aimed at attracting investment funds by territorial locations, contributing to the comprehensive socio-economic development of regions. It is the complex implementation of a dynamic approach to the realization of territory marketing that allows one to synergistically neutralize the effects of external and internal challenges and threats.

Literature review. Researchers have developed a significant corpus of scientific works in which various aspects of the implementation of territory marketing are highlighted. So Botschen, et al. [1] offer an interdisciplinary approach to the development of a territory marketing strategy, but the authors focus only on the formation of a brand of a certain location. Ranasinghe [2] expands the concept of territory marketing to marketing aimed at promoting the comprehensive development of a specific location using a well-known brand. Gavrinelli, et al. [3] indicated the necessity of using the marketing of territories as a tool of regional management. Complementing the previous study [3], Tortora, et al. [4] noted that the complex use of territory marketing requires modern information technologies using the example of big data analysis. Snieska, et al. [5] indicated the growth of business in those locations where smart technologies were used for marketing territories. Later, Zykien, et al. [6] introduced the assessment of regions according to the location attractiveness index for business development when applying territory marketing. This was confirmed in the study by Roszko-Wójtowicz, et al. [7] when conducting a multidimensional analysis of regional investment attractiveness in Poland. In general, the analysis of above-mentioned scientific works indicates the presence of a certain trend in the evolution of territory marketing.
Mohcine, et al. [8] come to the conclusion that territorial competition leads to the need to mobilize tools that have something in common with corporate marketing and peculiarities associated with a comprehensive territorial offer. Marchuk [9] named the components of digital marketing. This approach to task fragmentation is used in our work.

Goryaschenko, et al. [10] draw attention to the fact that the clustering of the consumer community by territory in the marketing strategy should not exclude a personal approach to each consumer. Vasylytsiv [11], using the example of the pandemic, points to changes in approaches to the marketing of territories in connection with the strengthening of external threats. Implicitly, the author points to the need for dynamic transformation of marketing as a response to external influences, which is used in the presented article. This is confirmed by a study conducted by Yanosh-Dmitrenko [12], in which it is indicated that the fight against COVID-19 contributed to the digitalization of marketing. Digitalization, as an effective tool of communication marketing of the enterprise during the pandemic, was studied in detail in the work by Andrushkevich, et al. [13]. Kalina [14] researching trends in digital marketing points to the increasing importance of territory marketing for small regional enterprises. Loiko [15] proved the presence of a “focal point” of a marketing communication strategy for various communication channels and their impact on the marketing of territories. Ponomarenko, et al. [16] study innovative technologies that affect the development of marketing and its infrastructure, a comprehensive description of IT tools. The article by Carp [17] points out the need for constant updating of IT tools in marketing, which is due to the significant competition of locations that require sustainable development of the economy and social assets.

In the monograph by Oklander, et al. [18] the “problems of developing theoretical and applied provisions of digital marketing as a specific form of marketing in the conditions of informatization of society” are studied. The theoretical basis of IT implementation in marketing developed by the authors created prerequisites for the presented work. In the article by Oklander, et al. [19] an analysis of technological innovations was carried out and promising directions of digital marketing were indicated. They were all used in the presented article.

Unsolved aspects of the problem. The analysis of the scientific literature indicated that the impact of digital technologies on the formation of new marketing opportunities for the implementation of integrated strategic development of territories requires in-depth research, in particular, establishing the tasks of digital marketing of territories and directions for increasing its effectiveness. Quantitative assessment of the effectiveness of digital marketing of territories also requires additional research.

The purpose of the article is to develop a mathematical approach to quantitative assessment of the effectiveness of digital marketing of territories as well as to determine the tasks of digital marketing of territories and directions for increasing its effectiveness.

Methods. During the content analysis, it was established that the marketing of territories, in its narrow sense, contributes to the growth of intangible assets in certain territorial locations, in particular, the formation of such an intangible asset as a brand of a certain location. The measurement of marketing effectiveness, in this case, should take place in non-financial indicators. These indicators are widely used in scientific literature: brand loyalty, brand awareness, brand image, perception of quality, etc. Since in the presented study it was decided to analyze the marketing of territories in its broadest sense, it is proposed to use not the mentioned qualitative non-financial indicators, but quantitative indicators to evaluate the effectiveness of marketing.

As researchers often associate the effectiveness of marketing activities with profitability from the implementation of marketing measures, which in some scientific works is called “return on marketing investment” (ROMI), a quantitative indicator is used in the scientific literature for this purpose

\[ \text{ROMI} = \frac{GP - MC}{MC}, \]

where \( GP \) is gross profit; \( MC \) is marketing costs.

By using the method of induction and deduction, the authors developed a modification of the indicated approach. For this purpose, marketing stages were stratified into:

1. Stage of market research, selection of marketing tools, planning of marketing activities, development of a marketing strategy.
2. Stage of implementation of marketing measures and use of marketing resources.
3. The stage of research and evaluation of the achieved results of marketing strategy implementation.

Each stage offers its own method for evaluating marketing effectiveness.

For the stage of market research, selection of marketing tools and planning of marketing activities

\[ \eta_1 = E/(Q_1 + Q_2), \]

where \( E \) is timeliness and quality of performance of works at the first stage; \( Q_1 \) is direct costs for market research and payment under contracts to involved scientific institutions and subcontracting organizations; \( Q_2 \) is labor costs of the management that organizes and implements the first stage.

For the stage of implementation of marketing activities and use of marketing resources

\[ \max \eta_2 \sum \frac{\partial W}{\partial t} \rightarrow \max, \]

where \( W \) is the amount of marketing resources; \( \frac{\partial W}{\partial t} \) is the rate of development of marketing resources; \( t \) is time. At the same time, we take into account the fact that the rate of development of marketing resources correlates with the effectiveness of marketing measures.

For the stage of evaluation of the achieved results of marketing strategy implementation

\[ \eta_3 = (B_2 - B_1) \left( \sum_{i=1}^{n} D_{1i} + \sum_{j=1}^{m} D_{2j} + \sum_{k=1}^{h} D_{3k} \right), \]

where \( B_2 \) is the volume of purchased tangible and intangible assets in the specified location after the end of the activities according to the chosen marketing strategy; \( B_1 \) is the volume of tangible and intangible assets in the specified location before the start of the implementation of the marketing strategy; \( D_{1i} \) is research costs for the selected location for each \( i^{th} \) type of them in accordance with the marketing plan; \( D_{2j} \) is costs for the implementation of measures according to the marketing strategy for each \( j^{th} \) type of them according to the plan; \( D_{3k} \) is costs for the formation of digital infrastructure for the selected location for each \( k^{th} \) type of them according to the plan;

\[ i = 1, \ldots, n; j = 1, \ldots, m; k = 1, \ldots, h; n, m, h \]

is the total amount of relevant expenses for each of their types.

For the option of introducing individual projects, accordingly, a single strategic plan for the marketing of territories and dynamic transformation of marketing processes, it is necessary to solve a complicated complex problem, the formulation of which is proposed to be mathematically presented as

\[ \min \sum_{i=1}^{q} \eta_4 \left( B_{1i} - B_{2i} \right) \left( \sum_{i=1}^{n} D_{1i} + \sum_{j=1}^{m} D_{2j} + \sum_{k=1}^{h} D_{3k} \right), \]

where \( q = 1, \ldots, q \) is the project index; \( g \) is the total number of projects in the strategic plan of marketing activities; \( B_{2i} \) is the volume of purchased tangible and intangible assets in the specified location after the end of the activities according to the relevant project of the marketing plan; \( B_{1i} \) is the amount of tangible and intangible assets in the specified location before the start of implementation according to the corresponding
marketing plan project; \( D_{2z_2}, \ D_{3z_3} \) are relevant costs for each of the projects in accordance with the implementation of the strategic marketing plan.

The use of the method of analysis and synthesis made it possible to propose an effective implementation of the procedure for coordinating projects to achieve a strategic goal and optimize the difference between gross profit and costs for marketing and equipment, which requires a dynamic transformation of marketing processes in accordance with changes in the external and internal circumstances of the implementation of the marketing plan. This necessitates the use of computer analytics tools capable of processing large amounts of data.

**Results.** Territory marketing can be considered in the narrow and broad senses of this definition. A narrow understanding of this definition refers to marketing activities aimed at creating a positive image of a certain geographic location in order to attract investors, etc. Broad understanding defines marketing as an integral tool of market relations, aimed at studying the peculiarities and potential of the regional market to strengthen the economic and social capabilities of the territorial location, increase the competitiveness of the location as a whole and in certain areas of activity.

This allows us to formulate the purpose of marketing of territorial locations. The first is the formation of an effective level of dynamic adaptability of the community of the specified location to external and internal challenges, the formation of prerequisites for the economic and social development of the community, and its competitiveness at the level of other territorial communities.

Marketing activities should be aimed at subjects whose market interests are concentrated in a specific territorial location. These subjects can be stratified into two main groups: external (investors, tourists, etc.) and internal (business representatives and the population of the specified location).

The interest of external subjects in the economic and social development of the territorial location lies in the fact that the specified development determines the appropriate level of ensuring their interests: quality and service for tourists; provision of business with qualified personnel, etc. The economic and social level of domestic subjects is directly related to the well-being of their territorial location.

Each of these groups requires the use of different sets of marketing tools, methods and tactics. This allows us to determine the range of tasks that must be solved by the marketing of territorial locations:

- determination of the existing state of the territorial community and its place among competing communities;
- identification of obstacles to achieving a higher level of economic and social development;
- proposing solutions to identified problems;
- determination of available and required amounts of resources to achieve the defined goal;
- development of territory marketing strategy;
- offering a step-by-step plan for implementing the territory marketing strategy.

The named purpose of marketing of territorial locations and the range of problems that it must solve determined the direction of the presented research.

The problem was that for the effective implementation of marketing tasks, it should be preceded by a study on the peculiarities and potential of the market of a certain territorial location, which should have not only a geographical dimension. The specified research should be conducted not even on one of the time segments, but in the dynamics that are determined by changes in external and internal influences. And this requires significant financial and organizational resources.

Such resources are available, mainly, in powerful commercial structures. And the business activities of such structures are to a greater extent interregional and even interstate in nature. This narrows down the necessity of researching the characteristics of the market in separate territorial locations for such structures. On the other hand, strengthening the economic and social capabilities of territorial locations is a direct task of local authorities. And this prompts the local authorities to find funds and direct the activities of specialized scientific structures of the region for the aforementioned research and the organization of the marketing of territories.

Digital marketing of territories also necessitates the formation of a certain infrastructure, testing and introduction of the latest information technologies. And, since the infrastructure and technologies for the marketing of a certain territorial location must be implemented, small and medium-sized businesses, whose activities are concentrated in this location, are beginning to use them. And this, in turn, determines the need for dynamic changes in marketing activity.

This testifies to the synergistic interaction of marketing of territorial location and digital technologies.

Small and medium-sized businesses economically strengthened by the application of territorial marketing tools through the structures of civil society and using economic and non-economic levers influence the regional authorities to improve and strengthen marketing tools, which forms the prerequisites for the comprehensive strategic development of territories. That is, a synergistic interaction of the named structures and processes is observed in this case too.

This allows us to confirm the formation of integrated marketing, in which the marketing of territories becomes a component of a complete system.

The process of digitization allowed significantly increasing the effectiveness of marketing in the following areas:

1. Increasing the level of coverage of target groups.
2. Personalization of marketing activities to each of the representatives of the target groups.
3. Ensuring the permanent nature of the personalized communication process.
4. The ability of marketing departments to communicate with representatives of target groups regardless of time and location.
5. Establishing two-way communication between marketing departments and representatives of target groups.
6. Using the population’s skills in using digital devices and the digital infrastructure formed by the market and the availability of mobile devices for the majority of the population.
7. Using the low cost of information dissemination under the existing digital infrastructure.
8. Easy availability of marketing departments to large volumes of information for analysis and segmentation of target groups.
9. The ability to analyze the results of communication influence and to change this influence in real time depending on the results of the analysis, which corresponds to the need for dynamic transformation of marketing processes.

The effectiveness of territorial marketing for the formation of a personalized approach to the communication process requires the termination of communication with the territorial community as a single community and considering it as a set of individuals, using and strengthening the values of personal communication.

This also makes it possible to form an extremely valuable tool for multiplying messages in relatively narrow territorial communities using community representatives to disseminate information. This leads to the fact that a large share of marketing content is created by its consumers.

The implementation of digital technologies provides the marketing of territories, both in the traditional sense of this definition and in its expanded sense, with the following additional advantages:

1. Personalization, the permanent nature of the communication process and the dynamic replacement of traditional digital tools with the latest ones make it possible to ensure a sustainable brand image.
2. The effectiveness of the perception of information by the representatives of the target groups increases due to the diversity and constant updating of the channels and tools of the information and communication process.
3. Convenience of the applied digital platforms for representatives of the target groups.
4. Interactivity of the information and communication process.
5. Formation of long-term communication for the creation of positive experience by representatives of target groups.
6. Implementation of project approach practices in strategic plans of marketing territories.
7. Use of the latest network practices with a significant distribution of the marketing process among performers, for example, when involving consulting and outsourcing companies.
8. Application of the so-called “unsystematic approach” to marketing, i.e., in the absence of adequate amounts of marketing strategy funding, the possibility to implement the marketing plan “instrumentally” — for each digital tool separately or project-wise, which allows applying low-budget technologies and dynamically using the benefits of coordinated implementation of each tool or project at the next stages of the strategic plan of marketing territories.
9. The possibility of dynamic coordination of marketing plans of specific territorial locations with marketing plans of territories that are geographically adjacent to the named locations or even higher than them in the structure of regional management (using the so-called “concentric marketing development”).

All of the above indicates: the influence of digital technologies on the formation of new marketing opportunities for the implementation of integrated strategic development of territories; the use of digital technologies as a prerequisite and tool for the dynamic transformation of territory marketing; the need for new approaches to marketing activities in territorial communities.

The types of ICT and digital tools that have become commonplace in marketing tasks can, using Ruban’s scientific work [20], be the following tools: Big Data technology; Google Ads contextual advertising; email marketing; retargeting; viral marketing; RTB (real time bidding); SEO (search engine optimization); SMM (social media marketing); SMO (social media optimization); SEM (search engine marketing). The level of adaptability of each of the mentioned types of digital tools for use in marketing activities can be determined at least by a wide range of specialized software. In particular, for SEO it is Linkody, SE Ranking, Wix, SEMrush, Moz Pro; for SMM — Lithium Social Media Management, Loomly, Promo by Slidely, AgoraPulse, Zoho Social; for email marketing — Zoho Campaigns, Campaign Monitor, Email Octopus, SENDER, MailChimp, etc.

To facilitate analytical research, marketers are offered the software products Google Analytics, Adobe Analytics, Twitter Counter, Appsee Mobile Analytics, and Bing Webmaster Tools.

The deployment of a wide range of software for analytical research in the field of marketing made it possible to form even a new direction of marketing activity — content marketing, which, from a wide range of strategies and methods, allows one to automatically select those that form the optimal options for communication with various segments of the target population, ensuring the achievement of strategic goal. Researchers identify digital content marketing as one of the most effective digital tools for marketing activities. Surveys demonstrate that the total values of its effective use (medium and large ROMI indicators) are more than 70 % [16, 21].

That is, it would seem that the main task of digitalization of marketing activity has been achieved, but there are two factors that lead to the need for a permanent dynamic transformation of marketing. This is, firstly, the rapid development and implementation of new digital technologies that open up new opportunities in the field of marketing; secondly, the emergence of new significant challenges, for example, such as the COVID-19 pandemic, large-scale military aggression in the east of Ukraine, which require new efforts and the search for new methods to adapt to these challenges.

All of the above allows us to assert not only the presence of a high level of integration of digital technologies in the marketing of territories, but also the emergence of a new direction — digital marketing of territorial locations, which determines the need for the dynamic nature of the marketing of territories and helps its effective implementation.

Fig. 1 indicates the main target groups, at the research of which the marketing of territories should be aimed. The necessity of researching the resources of the territorial location is also indicated. From these resources, a certain prospective number of them should be selected, in relation to which the work of research groups is carried out: a brand is developed, taking into account the maximum realization of the potential of the territorial location; the amount of funds for each of the stages of the marketing process named above is determined, etc. Also the subjects and objects to which the tools of the marketing process are directed, are indicated (external and local consumers, tourists, investors, various organizations and business structures) and which realize and implement the marketing process (local management bodies, local small and medium-sized businesses, local public organizations, local financial and research structures) [22, 23].

Fig. 1 also indicates the presence of not only a direct effect of the use of marketing information tools on the result, but also a reverse effect of an inappropriate result on the need to revise information tools. This leads to an increase in the adaptability of marketing of territorial locations to dynamic changes in external and internal influences and ensuring the permanence of the process of changing marketing tools, techniques and methods. The revision of marketing tactics, which consists in changing the implemented action plan in each of its stages is a concrete consequence of the dynamic change in external and internal influences for the marketing process.

The need for dynamic changes in marketing plans is also determined by a factor whose impact on the achievement of planned results within the specified time frame, in our opinion, is little discussed by the scientific community. This is a...
significant level of uncertainty in forecasting the economic, political and social situation, which significantly narrows the relevance of long-term marketing plans (Fig. 2). The following order of this change is proposed:
- implementation of marketing audit;
- analysis of the reasons for the inadequate result of the implementation of the next stage of the marketing plan;
- identification of unaccounted external and internal influences;
- making changes to the next stages of the marketing plan and the terms of their implementation.

At the same time, since it is proposed to consider the marketing of territories in a broader sense, the implementation of the strategy needs to cover a much larger range of directions than in the case of traditional marketing of a territorial location. The proposed additional directions for the formation of a marketing activity plan for the effective implementation of the territorial marketing strategy are stratified and detailed in Fig. 2.

The following areas for the formation of technical and technological infrastructure are highlighted as of particular importance for the acquisition of the appropriate level of effectiveness of the implementation of the territorial marketing strategy: service provision of investors; areas of interaction with local business and areas of ensuring proper educational training of personnel. All of the above contributes to the implementation of the strategic marketing plan for the dynamic transformation of marketing processes.

Conclusions. A mathematical formalization of the quantitative assessment of the effectiveness of marketing activities has been developed. For this purpose, the stratification of the marketing stages of territories has been introduced. The possibility of implementing a project approach is taken into account, provided that individual projects are separated in time, in accordance with a single strategic plan for the marketing of territories and dynamic transformation of marketing processes. This determines the need to coordinate projects to achieve a strategic goal and optimize the difference between gross profit and marketing costs for dynamic transformation of marketing processes in accordance with changes in the external and internal circumstances of the implementation of the marketing plan. And this, in turn, requires the use of computer analytics tools capable of processing large data sets.

It is noted that the purpose of marketing of territorial locations is to form an effective level of dynamic adaptability of the community of the specified location to external and internal challenges, to ensure the prerequisites for the economic and social development of the community, its competitiveness in comparison with other territorial communities.

The range of tasks that must be solved by the marketing of territorial locations and the fact that the implementation of digital marketing of territories determines the need for the formation of a digital infrastructure have been determined. And, since the infrastructure for the implementation of marketing at a territorial location will be implemented according to the marketing plan, it will be used by small and medium-sized businesses whose activities are concentrated in this region, which causes the need for dynamic changes in marketing processes. This indicates a synergistic interaction of territory marketing and digital technologies. A synergistic mutual influence of business activities in the territorial location and of territory marketing is also formed, since economically strengthened business as a result of marketing influences the regional authorities to improve and strengthen marketing tools.

Areas of increasing the effectiveness of digital marketing of territories are established and its advantages are detailed.

The proposed scheme for the implementation of territory marketing, which indicates the presence of not only the direct effect of the use of marketing information tools on the result, but also the reverse effect of an inappropriate result on the choice of information tools, which causes an increase in the adaptability of marketing to dynamic changes in the external and internal influences and ensures the permanence of the process of changing marketing tools, techniques and methods.

Directions for the formation of a marketing activity plan for the effective implementation of the territory marketing strategy are detailed.

It is indicated that a significant level of uncertainty in forecasting the economic, political and social situation is one of the factors that determine the need for dynamic changes in marketing plans. The procedure for this change has been developed.

Mechanisms of synergistic interaction of digital technologies and marketing of territorial locations as well as synergistic interaction of local business, which strengthens its economic capacity through the use of marketing and strategic marketing of territories require further research.

![Fig. 2. Directions for the formation of a marketing activity plan for the effective implementation of the territorial marketing strategy](image-url)
Цифрові технології як причина та інструмент динамічної трансформації ...комунальних університетів та інших закладів виховання.

Мета. Розробити математичний підхід до кількісної оцінки ефективності цифрового маркетингу території. Визначити задачі цифрового маркетингу території та напрями збільшення його ефективності.

Методика. У дослідженні використані загальні та спеціальні методи пізнання: контент-аналізу для обґрунтування використання кількісних показників щодо оцінювання ефективності маркетингу; методу індукції та дедукції для розроблення математичного підходу до оцінки ефективності цифрового маркетингу території; методу аналізу й синтезу для узагладження проектів у рамках динамічної трансформації маркетингових процесів.

Результати. Розроблено математичну формалізацію кількісної оцінки ефективності маркетингу територій при забезпеченні можливості реалізації проектних підходів та умов усього процесу.

Висновки. У дослідженні використано математичний підхід до оцінки ефективності маркетингу територій, що забезпечує аналітичні можливості використання кількісних показників для оцінювання ефективності маркетингу територій.

Ключові слова: маркетингова діяльність, маркетингові території, стратегія маркетингу, цифрові технології.

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