

## The Creation of Dynamic Visual Objects as a Factor for Optimizing Advertisements in E-Commerce

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### Abstract

**Introduction:** The Covid-19 pandemic has boosted the development of online retail and has created an urgent need to transform digital marketing tools. The purpose of the study is to find ways to optimize advertising in Google and Facebook, which are the superior digital advertising platforms as their top digital advertising platforms in terms of both usage and performance.

**Methods:** An experiment conducted as part of the study showed that the use of the dynamic optimization tool allows you to enrich existing feed data with additional 1st and 3rd party data and automatically compile visuals with additional information obtained from the feed and additional graphical overlays. The proposed method was tested on Facebook and Google with an analysis of click through rate, conversion rate and conversion cost indicators.

**Findings:** The research results showed that the use of the dynamic optimization tool improves the effectiveness of online advertising, all the studied indicators has improved on both platforms. The results obtained complement to the few literature sources devoted to creating enriched feeds on various internet companies, so the work is of significant interest for marketers and business owners who work in the field of e-commerce.

**Originality:** It has been established that in order to increase the conversion rates of ad campaigns and improve the quality of communication with the audience, a deeper study of the behavioral characteristics of visitors of internet resources, as well as high-quality visual content of the ads, are required.

**Keywords:** E-Commerce, Internet Advertising, Visual Content, Conversion, Dynamic Optimization Tool.

### Introduction

Globalization, a hypermedia environment, personalization, lower transaction costs and other opportunities the internet provides for companies to interact with customers and counterparties have made it an effective means of doing business. According to Research and Market (2022), there were about 2.14 billion digital shoppers in the world in 2021 and the global e-commerce market reached a value of US\$ 13 trillion. In these conditions, digital marketing tools and methods were actively developed, the radical transformation of which was due to the peculiarities of internet communications and e-commerce. Wide coverage of the most economically active audiences, multiplatformism, high interactivity

of interaction, personalization of communication, great opportunities for targeting and consumer research have strengthened the role of internet marketing. Modern internet technologies are especially active in influencing advertising, which is becoming more diverse, dynamic, predictable and customer-oriented.

Today, internet advertising occupies one of the leading places in the advertising market; in the period from 2017 to 2021, the share of expenses on it in the total structure of advertising expenses increased by 12.4% and amounted up to 52.1% (eMarketer, 2022a). Due to the increasing demand for it, internet advertising is becoming more and more expensive, while the effectiveness of traditional advertising solutions is decreasing, which requires the search for new methods to increase its effectiveness. In Ukraine the main platforms for paid advertising are Google Ads, Facebook and YouTube. According to Statista (2023) the number of Facebook users in Ukraine has followed an upward trend between September 2019 and January 2022. As of August 2022, there were about 22.3 million Facebook users in Ukraine. Therefore, we can talk about an increase in the potential of this platform and further interest in it from the advertiser.

The modern user, under the pressure of 'advertising noise', does not want to waste time on long searches for the required product and deepening into the features of user interface. Therefore, to attract potential consumers, improve the quality of communication with the audience and effectively promote the product, not only the correct selection of keywords, an increase in the number of advertising campaigns and the attractiveness of content are needed, but also a deeper and more structural study of the behavior of internet resource visitors, as well as high-quality visual content pages of sites that allow you to integrate into the users 'zone of interests and comfort'. Considering the behavioral characteristics of visitors allows you to improve the quality of search, as well as more efficiently plan and conduct promotional activities. Simultaneously, improving the visuals of the website pages through the composition and placement of photos, illustrations, videos, descriptions, ratings, reviews helps to reveal all the features and competitive advantages of products, ensures the retention of the attention of a large number of users, which contributes increasing of sales.

In the conditions of the prevailing same type online content on the sites of many internet platforms, external and internal optimization of sites becomes relevant by improving the visual content of internet resources and creating effective search algorithms and creative materials about the company and its products based on the analysis of behavioral characteristics. Such optimization is necessary to further increase website conversion and attract the attention of more consumers to the product, and, therefore, reduce the cost of an advertising campaign and increase the profit of sellers.

The advantages, opportunities and active development of internet advertising determine the significant interest of marketers and academics in studies of its impact, formats, technologies and areas of improvement, the results of which for certain periods are summarized in reviews Ha, (2008), J. Kim & McMillan, (2008), Liu-Thompkins, (2019), Varnali, (2021) Abou-Elgheit, (2018), Alam et al., (2019), (Komodromos et al., (2018) note a noticeable positive effect of social media and, in general, the use of digital marketing on the volume of purchases made in the internet, and also note an increase in the market share of organizations using e-commerce. Schumann & Thorson, (2007) provides comprehensive reviews of internet advertising theory and research, examining its impact on consumers, their reactions to it, and human needs and trends that may have a significant impact on the future of internet advertising.

Much attention is paid to research on the impact of various factors on internet advertising and its impact on consumers. Among the factors that affect the effectiveness

of internet advertising and customer intent to make a purchase entertainment, information credibility, economy, value, customization, trendiness and irritation are highlighted (Azeem & Haq, 2012; Bakshi and Gupta, 2013; Firat, 2019). In the course of studying internet narrative online advertising Ching et al., (2013) investigated the impact of four elements of advertising design: interactivity, entertainment, brightness and self-reference on consumer attitudes towards the advertised product. Van Doorn & Hoekstra, (2013), examining the trade-off between tailoring advertising to the needs of the individual consumer and the need for personal data, showed that high personalization, heightens compulsiveness and negatively affects the intent to purchase. Abtahi et al., (2017) identified the factors influencing the implementation of online advertising in advertising agencies, the most significant were 'the technical knowledge of a client manager', 'the country's readiness for e-commerce' and 'the ability of agencies to develop internet advertising'. Gaber et al., (2019) noted the influence of the usefulness of content in the attitude of consumers towards advertising. Their research was based on the study of the influence of the quality of advertising in Instagram and the perception of it on consumers.

The emergence of new types of internet advertising necessitates their comparison and joint use in order to obtain a positive synergistic effect. Consumer behavior largely depends on the sophistication of shopping channels (Hossain et al., 2019; Hossain et al., 2020). This factor is decisive in the formation of consumer experience, which today is becoming the norm and is increasing due to the development of mobile applications, internet services and additional digital tools (Shukla & Nigam, 2018). The characteristics of various types of internet advertising and their impact on consumer buying behavior were studied by Boone et al. 2015) and Deshwal, (2016). De Haan et al., (2016) compared the performance of several types of internet advertising in terms of generating traffic, impacting conversions, and driving revenue growth using a structural vector autoregressive model and limited impulse responses. Goldfarb & Tucker, (2011) show that the combination of obtrusive online advertising and context-based online advertising performs worse than independent use, due to consumer perception of privacy.

The effectiveness of internet advertising is the most important research topic. (Manchanda et al., 2006), Hoban & Bucklin, (2015) analyzed the effects of display ads on users at different stages of purchase funnel. Robinson et al., (2007) conducted empirical studies of the influence of seven creative characteristics of banner advertising on the effectiveness of online advertising using a multiple regression model. Santoso et al., (2020) have proven that digital advertising is effective even in low-attention environments. Song et al., (2020) proposed to use the display area indicator to measure the effectiveness of online advertising, for which they built a model of the displayed area and calculated its accuracy.

A lot of research are devoted to the methods and technologies used in internet advertising in order to increase its creativity and get more efficiency. Adler et al., (2002) investigated algorithmic issues related to area planning for internet advertising. Rutz et al., (2012) presented a modeling approach to assess the purchase conversion performance of individual keywords in paid search advertising. Breuer & Brettel, (2012), when analyzing the short-term and long-term effectiveness of various types of internet advertising channels, added separate time lags for each advertising channel, which allowed to simulate long-term advertising effects and provided important ideas for improving the distribution of advertising budgets. Lambrecht & Tucker, (2013), examining dynamic retargeting ads that use information from the browsing history of a website, found an increase in its effectiveness when consumers exhibit browsing behaviors that involve changing their preferences for the advertised product. Xu et al.,

(2014) proposed a model that allows anyone to investigate the impact of different types of online advertising on purchase conversion by capturing dynamic interactions between ad clicks and predicting future purchases and interactions in customer relationship management. Narayanan & Kalyanam, (2015) investigated the causal effect of position in search engine advertising listings on outcomes such as click-through rates and sales orders. Kim, (2018) investigated the effect of ad settings and options on how internet users perceive multiple ad impressions and how they relate to ads and the website in the context of in-stream video ad serving. Aksu et al., (2018) addressed the expansion of online advertising into the Internet of Things (IoT) and proposed an IoT advertising platform architecture with particular emphasis on issues related to the delivery of advertising content, user security and privacy. Dwivedi et al., (2021) presented the collective insights of several leading experts on the development of digital and social media marketing. The experts' perspectives offer a detailed narrative on key aspects of this important topic as well as perspectives on more specific issues including artificial intelligence, augmented reality marketing, digital content management, mobile marketing and advertising, B2B marketing, electronic word of mouth and ethical issues therein.

Pandemic 2019 has made serious adjustments to the practice of advertising. The transformation of marketing tools, changes in the work of the media, the impact on the advertising market during the coronavirus (Covid-19) pandemic were actively discussed by the authors DiResta et al., (2020), who note that in the current conditions, to maintain a stable income, companies and brands are forced to rethink their views on current and future ad campaigns. The statement of King et al., (2022) is becoming relevant in order to increase the efficiency of communication between participants in online communication, it is necessary to create and improve special applications that facilitate the delivery of information to users.

The relevance of the research topic on increasing the conversion rate of advertising in e-commerce using the Dynamic optimization tool (DOT) is determined by the following main circumstances. The rapid development of advertising activities due to its relevance, the expansion of tasks and the emergence of new goals, forms of advertising require scientific analysis and an economically sound process for the formation of an advertising campaign in accordance with existing and constantly changing market conditions. One of the main tasks of the advertiser is the ability to automate the processing of data in the feed and create creative materials based on the information received with the possibility of additional use of third-party data, the use of advertising events as an informational, economic and business tools to influence the consumer audience. The creation of a feed is a set of separate stages, each of which consists of a set of actions aimed at the formation, implementation and organization of an advertising message, the result of which at the 'output' will be a certain use value and cost, involves a reorientation from successively obtained results to the final integrating, which is the initial and obligatory element in the formation of an advertising campaign. The use of DOT saves the advertiser's staff from routine operations and involvement of employees of other departments of the company (IT departments, creative departments, et cetera) in the formation of data flows, which allows employees to focus their efforts on solving more important creative tasks in their spare time and save on wages and hiring additional employees by automating processes.

The purpose of this study is to prove that visually rich messages are the most effective communication method. Several research problems were solved in the process of achieving this goal. The analysis of the structure of the display advertising market in Ukraine in the context of a coronavirus pandemic was carried out. The features of advertising as a

communication technology are described. The possibilities of using the Dynamic Optimization Tool (DOT) when creating an advertising campaign are considered, taking into account the economic conditions at the time of its implementation. The influence of the results of using the method on increasing conversion on various sites is analyzed.

In the context of this study, it is shown that the internet has become the main communication channel in modern advertising media. The most effective communication implementations are visually rich messages, as they grab the attention of the audience better. This means that the main efforts in the development of advertising technologies should be aimed at optimizing this placement toolkit. The scientific novelty of this study is the addition of graphic overlays to visual advertisements, which significantly increases their conversion rate.

## Methods

The comparison method was used in the work to analyze the impact of banner and contextual advertising, in order to identify more attractive samples of advertisements, for further research (Kindermann, 2017). The study also used a comparison method to identify the interaction between banner advertising and website perception.

The study is based on the Dynamic optimization tool (DOT) method. This tool allows you to automate the processing of data in the feed and create creative materials based on the information received with the possibility of additional use of third-party data. It is on the use of the DOT method that all the conclusions and recommendations described in this study are built. Its essence lies in the choice of the optimal visually acceptable product image for a particular user in the Facebook carousel. The authors used quantitative methods for evaluating media indicators CTR and CR to evaluate the effectiveness of an advertising campaign before and with DOT, using the example of the Ukrainian Internet retailer of electronic equipment “АΛΛΟ” (“ALLO”). Gountas et al., (2019) note, it is these indicators that are used to evaluate the qualitative and quantitative indicators of advertising.

## Results

The 2020 pandemic had a significant impact on the trends in the global advertising market. Covid-19 was the key driver of the 1.2% decline in global ad spending in 2020. However, already in 2021, advertising spending in the world increased by 19.9% (eMarketer, 2022b). At the same time, online advertising has been actively developing, the costs of which increased by 12.9% in 2020 and by 10.1% in 2021 (eMarketer, 2022a), due to an increase in online purchases by consumers. In the advertising market of Ukraine in 2020-2021, there were also changes in the structure due to the introduction of restrictive measures caused by Covid-19 (Table 1).

Table 1. General picture of the media advertising market in Ukraine in 2019-2021

Advertising	Total 2019, mil UAH	Total 2020, mil UAH	Total 2021, mil UAH	% difference 2020/2019	% difference 2021/2020
TV advertising, total	11.527	12.175	13.642	5.6%	12%
Direct advertising	10.089	10.593	11.854	5%	12%
Sponsorship	1.438	1.582	1.788	10%	13%
Press advertising, total	1.850	1.466	1.599	-20.8%	9.05%
National press	1.106	866	960	-21.7%	10.8%
include Sponsorship	284	215	243	-24.4%	13%
Regional press	320	243	268	-23.9%	10.25%
Specialized press	425	357	371	-16%	4%

Radio advertising, total	717	717	855	0%	19%
National	518	512	605	-1%	18%
Regional	65	65	80	0%	23%
Sponsorship	134	140	170	4%	21%
OOH Media, total	4.240	3.159	4.098	-25%	30%
Outdoor advertising	3.283	2.433	3.092	-26%	27%
Transport advertising	600	351	397	-42%	13%
DOOH	205	291	518	42%	78%
Indoor advertising	152	85	90	-44%	6%
Cinema advertising	58	20	26	-65%	30%
Digital (Internet) Media advertising	6.379	6.980	10.833	9%	55%
Total advertising media market	24.771	24.517	31.053	-1%	26.7%

Note: OOH = Out of home; DOOH = Digital Out of Home; UAH = hryvnia, official currency of Ukraine (the average official rate of the National Bank of Ukraine in 2019 = 1 USD--25.85 UAH; in 2020 = 1 USD--26.96 UAH; in 2021 = 1 USD--27.29 UAH) (source: generalized by the authors (VRK, 2020, 2021))

The quarantine introduced throughout Ukraine in connection with the Pandemic has led to a decrease in the budgets of most types of advertising in 2020. The budgets of Cinema advertising (by 65%), OOH Media (by 25%) and Press advertising (by 20.8%) were cut significantly. At the same time, TV advertising and digital (internet) media advertising budgets grew by 5.6% and 9%, respectively. In 2021, the situation in the field of advertising has stabilized. Most advertising budgets have returned to 2019 levels and even increased, with the exception of Press advertising, OOH Media and Cinema advertising. DOOH-advertising and digital (internet) media advertising posted the largest growth, respectively 78% and 55%.

The development of digital (internet) media advertising, the budget of which ranks second after the budget of TV advertising, is explained by the dominance of global players (Google, Facebook, TikTok), the low entry threshold, the development of Programmatic and, in part, the post-Covid adaptive revival of the industry and the relocation of budgets from traditional offline media. Digital (Internet) advertising has become a leading segment in the media market. Search advertising and digital video advertising, which occupy the largest share (almost 80%) in the structure of digital advertising, also showed the largest positive dynamics in both 2020 and 2021 (Table 2).

Table 2. Digital advertising (according to IAB classification) in Ukraine in 2019-2021

Digital advertising	Total 2019, mil UAH	Total 2020, mil UAH	Total 2021, mil UAH	% difference 2020/2019	% difference 2021/2020
Display ads, social media ads, rich media	3.240	3.180	4.780	-2%	30%
Digital video, include Youtube	2.939	3.800	6.053	29%	59%
Total internet media	6.379	6.980	10.833	9%	55%
Search ads, include GDN	9.000	12.300	17.835	37%	45%
Influencer marketing		336.8	505.2		50%
Other digital ads	676	630	693	-7%	10%

Total internet advertisement market	16.055	20.247	29.867	24%	48%
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Note: GDN = Google Display Network (source: generalized by the authors (VRK, 2020, 2021))

For greater coverage and deeper promotion of the product, it is necessary to attract the attention of more consumers to it. The constantly growing competition in e-commerce imposes certain requirements for the quality, design and reliability of content. This requires the creation of attractive content by improving the visual content of internet resources. Website page visualization means filling with text, useful information, infographics, photos, videos and helps to reveal all the features and competitive advantages of the product. The modern consumer, under the pressure of advertising noise, does not want to waste time searching for the desired product and delving into the page interface. It is much easier to immediately present the product of interest to the customer and show it in the correct visual interpretation. Therefore, not only internal, but also external page optimization is necessary.

When evaluating digital advertising, current trends force us to take into account complex and combined traffic purchasing models, which lead us to decreasing in the share of purchases through cost per click (CPC) model, which dominated search advertising 2-3 years ago. It became necessary to revise this issue. Until recently, the internet advertising market consisted of two segments: display advertising and contextual advertising. Most often, only contextual and search advertising were previously used to get an instant response from the buyer. In the current situation, technologies make it possible to achieve similar conversion rates in other online advertising channels with performance set ups. Media advertising provides information to a wide audience about goods and services, while social media advertising is aimed at encouraging consumers to buy a particular product or service.

It is more interesting to take a closer look at performance advertising, because the result obtained from the use of this type of advertising is expressed in specific indicators and can be measured: leads, site visits, increased sales, increased traffic, et cetera. Today, Performance Marketing covers almost all directions in the field of digital. One of the main channels used to implement the Performance Strategy is Facebook. The main advantages of such advertising are opportunity to present the entire advertising process in numbers, attract the target audience using a data-driven approach (data management) and ability to quickly and flexibly respond to market changes, while adjusting the advertising budget.

In its turn, display advertising is used to build a connection between the consumer and the brand. Most often, with the help of display advertising, the tasks associated with the formation of demand and the stimulation of the consumer to make a purchase are solved. Today, in the field of e-commerce, display advertising is the most commonly used way of promotion. We can say that display advertising is a certain set of visual and audio materials that are aimed at attracting the attention of the consumer. As noted above, the simpler and less innovative the advertisement on a page, the fewer consumers will pay attention to it. Consequently, new solutions are needed related to filling visual content. The conditional separator of these two types of advertising is the conversion rate. Ad formats with a high conversion rate are classified as performance ads, while ad formats with a low conversion rate are classified as display ads. In the example, it looks like this, compare a banner about a certain new yogurt in a news article devoted to a healthy lifestyle and a contextual ad for the search query *“buy strawberry yogurt”*, which in turn will lead to the website of an internet yogurt seller. It is quite obvious that in the second case the probability of buying a product after clicking on the ad will be much higher than in the first one, because the person who entered the request already intends to buy this product.

Next, we will talk about a subtler separation within formats on social media platforms. According to the Kleiner Perkins Internet Trends Report, product searches occur across three

main groups of channels: Amazon, Search (dominated by Google) and others (dominated by social channels, Facebook). Unlike Amazon and Google Shopping Actions, which are primarily e-commerce search channels, Facebook is a view-based product discovery channel and also provides a familiar experience of product discovery through customer-initiated search. This platform has a similar conditional division into conditionally more media and more performance formats. So, advertising posts on Facebook can be attributed to the display format, because this format is aimed rather at informing the target audience, and performance formats, such as a carousel gallery, where the consumer in the format of several shifting small pictures is offered for purchase specific products of one or another advertiser. Therefore, Facebook was chosen to conduct research in Ukraine.

Products in carousels are generated from a data feed. A data feed is a structured description of products in a machine-readable way of getting information. The feed contains an image of the product, its price before the discount, the discount level, the new price, dimensions, materials, country of production and other parameters of the products. The product feed is usually formed according to the data of the site's CRM system, so the feed provides the most complete and up-to-date information about the assortment at a given moment in time.

As already mentioned, on the basis of feeds, such an advertising format as a product gallery on Facebook is formed. The products presented in the gallery look the same, no matter who is the manufacturer or seller of the product, all ads of this type will look the same, according to the format presented by the placement site itself – the product is on a white background, the price of the product is in the descriptive block under the product image on the right, the product name is on the left, the use of corporate colors, fonts and other attributes that allows you to add a corporate identity to your ad is technically impossible. This is where the chance of optimization was found with the aim to increase conversion in this ads format – using of the DOT. This tool allows you to automate the processing of data in the feed and create ads materials based on the information received with the possibility of additional use of third-party data. The essence of the method is to transfer to the product image, as the most visually perceptible part of the ad, all the necessary information about the product, which will likely affect the user's decision to purchase and make the ad unique, standing out from the rest of advertisers on this platform (Figure 1).

What did we have--regular image of the product from data feed



What do we propose--to create an image of the product adding vast amount of additional product features

Figure 1. The example of ads image creation with the use of additional data transferred to the ads product picture (source: authors' own elaboration)

The algorithm for creating informative and prominent image data consists of three steps. At the *first* stage, the existing customer feed is taken as a basis, the existing data is taken from it, which will later be used to create an image--a template for a new image ad is created. The template uses elements of the corporate identity of the advertiser--logo, corporate colors, corporate fonts, et cetera. Further, it is determined where the image and the price of the product will be placed, the inscription 'new', 'discount' and other informative elements. For example, when buying a TV for a consumer, in addition to the price, information about TV diagonal, the TV matrix, the sound system, the availability of Smart TV functions, et cetera are important. All these elements, together with the corporate identity, make the ad more memorable and informative. At the *second* stage, all the elements of new images are programmed and transferred to a new feed, in which the image of the product is not just a picture of the product, but already contains all the above characteristics and elements. At the *third* stage, the new feed replaces the standard feed on the placement site, and after the launch of the advertising campaign, the consumer already sees new images in the product galleries. The implementation schemes are shown in Figures 2-7.

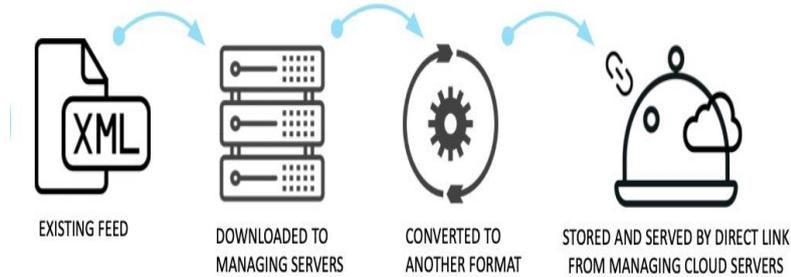


Figure 2. Transforming feed to other formats (for example, XML to CSV) (source: authors' own elaboration)

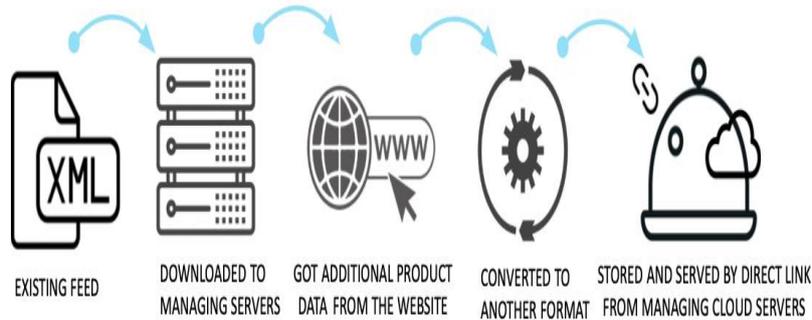


Figure 3. Transforming feed to other formats with the usage of additional data (source: authors' own elaboration)

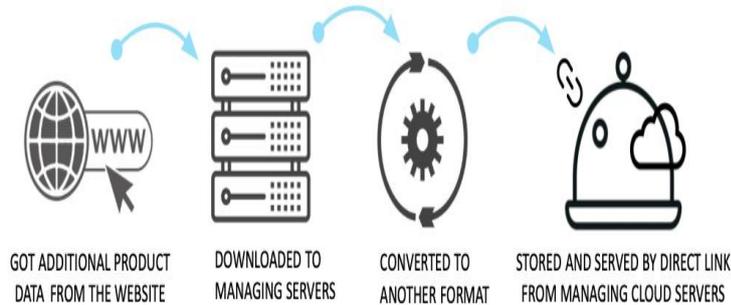


Figure 4. Making a feed from the scratch without using the existing base feed (source: authors' own elaboration)

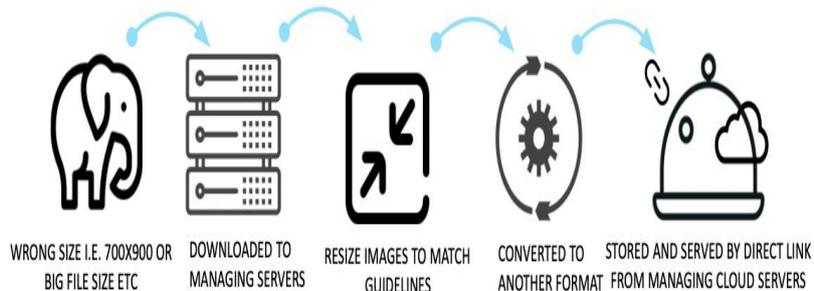


Figure 5. The scheme of work with the transformation (reduction) of images relative to the original (source: authors' own elaboration)

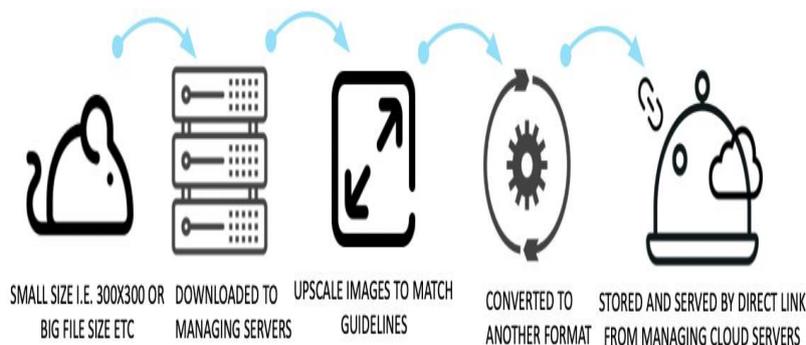


Figure 6. The scheme of work with the transformation (enlarging) of images relative to the original (source: authors' own elaboration)

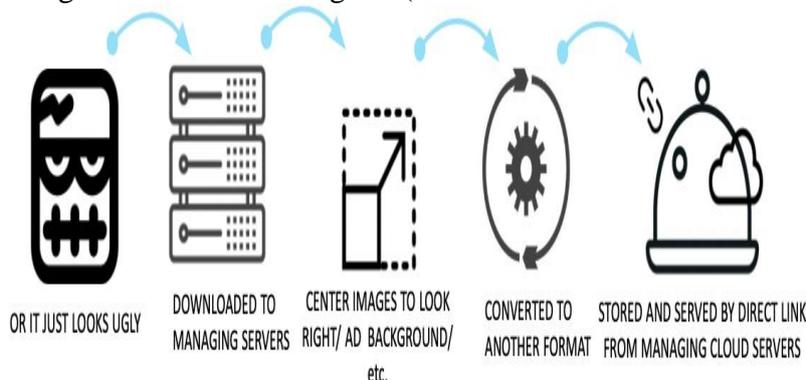


Figure 7. The scheme of working with the transformation (quality improvement, adding graphic elements) of images relative to the original (source: authors' own elaboration)

The number of Ukrainian Internet users, according to GlobalLogic, (2021) increased by 2 million, which is 33% more than in 2019, and at the beginning of 2021 amounted to almost 30 million, that is, approximately 67% of the country's population. This gives grounds to conduct research on internet advertising on the example of one of the internet sites in Ukraine. Today, a large number of different marketplaces are represented on the e-commerce market of Ukraine. The most prominent of them are: online store rozetka (rozetka.com.ua), Comfy company (the first omnichannel retailer of household appliances and electronics in Ukraine), Prom.ua company, ALLO company, which positions itself as a national marketplace. The research was carried out based on the statistics of the advertising campaign of the Ukrainian Internet retailer of electronic equipment ALLO. The advertising campaign of the ALLO retailer was taken as a basis, due to the fact that, in our opinion, *firstly*, this company, which combines: online stores and points of issue, logistics and financial services. *Secondly*, ALLO is the most dynamically developing, open and innovative company. *In addition*, in the context of the Covid-19 Pandemic, the company maintained its pace of development, and also began to develop new business areas.

It is known that the characteristics of the quality of an advertising campaign are CTR (click through rate--shows the number of clicks per 1000 ad impressions) and CR (conversion rate--shows the ratio of the number of purchases to the number of clicks, is calculated per purchase or, in other words, the targeted action). Testing the results of the implementation of DOT is presented in Tables 3-6 and Figures 8-9.

Table 3. Indicators without using DOT on the Facebook platform  
(period 01.06.2020–30.06.2020)

Impressions	CTR, %	Clicks	Cost per click, UAH	CR, %	Conversions	Conversion cost, UAH
49.066.667	0.21	103.040	5.40	0.80	824	675.26

Note: The result of an experiment during an advertising campaign for an electronics online store

Table 4. Indicators on the Facebook platform with the implementation of DOT  
(period 01.07.2020–30.07.2020)

Impressions	CTR, %	Clicks	Cost per click, UAH	CR, %	Conversions	Conversion cost, UAH
61.475.556	0.27	165.984	4.40	1.14	1.892	385.96

Note: The result of an experiment during an advertising campaign for an electronics online store

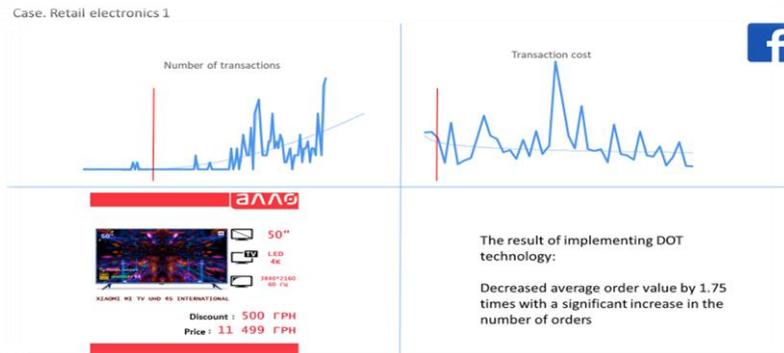


Figure 8. Result of testing DOT on the Facebook platform  
(period 01.06.2020–30.07.2020) (source: author's analysis)

As you can see from the Tables 3-4 and Figure 8, when using tool on the Facebook platform, CTR and CR indicators increased. The CTR increased by 28.6%, which indicates a higher click-through rate for ads. The CR indicator increased from 0.8% to 1.14%, while the cost of conversion decreased 1.75 times, which indicates the feasibility of using this method.

Table 5. Indicators without using DOT on the Google platform  
(period 01.06.2020–30.06.2020)

Impressions	CTR, %	Clicks	Cost per click, UAH	CR, %	Conversions	Conversion cost, UAH
268.717.333	0.15	403.076	3.79	0.52	2.096	728.84

Note: The result of an experiment during an advertising campaign for an electronics online store

Table 6. Indicators on the Google platform with the implementation of DOT  
(period 01.07.2020–30.07.2020)

Impressions	CTR, %	Clicks	Cost per click, UAH	CR, %	Conversions	Conversion cost, UAH
139.362.778	0.18	250.853	3.29	0.82	2.057	401.22

Note: The result of an experiment during an advertising campaign for an electronics online store

As can be seen from the data presented (Tables 5-6 and Figure 9), due to the implementing of DOT on the Google platform, the CTR of desktop users increases by 20.0%, the conversion to purchase (CR) increased from 0.52% to 0.82%. This means that with approximately the same number of sales, the cost of one conversion decreased by 45%.

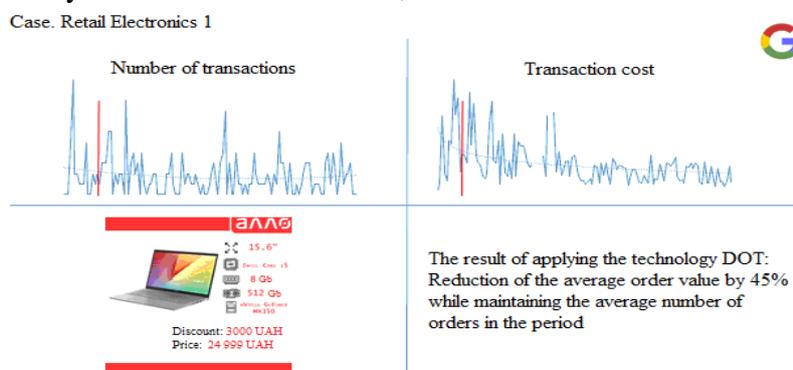


Figure 9. Result of testing DOT on the Google platform (period 01.06.2020–30.07.2020) (source: author's analysis)

An assessment of the statistical significance of the experiment to test the hypothesis about the effect of DOT on the level of conversion was carried out using the online calculator for the A/B test (Planet, 2022). Comparison of two variants of landing pages without and with the introduction of DOT was carried out with a given degree of reliability -95%, which indicates a high statistical significance of the test results. The calculations showed that the CR indicator for the option with the implementation of DOT is higher than the CR for the option without the use of DOT by 0.34% on the Facebook platform and by 0.3% on the Google platform, that is the variant with the implementation of the DOT turned out to be better.

The algorithm of the work of placement sites on the internet is due to the fact that it is necessary to launch new advertising campaigns frequently. Then inevitably there is a point at which the 'old' advertising campaigns of customers (those that have a lot of statistical data and which allow site placement algorithms to work better) currently show better performance data than the 'new' advertising campaigns using DOT technology. The advertiser is forced to accept the almost inevitable drawdown in the effectiveness of advertising campaigns for a period of 2 weeks to 2 months. This is a barrier to widespread adoption of the technology, as often advertisers are not ready to make such sacrifices in the current moment for the promise of increased efficiency in the future.

## Discussion

The results obtained by us overlap with the results of studies conducted by Dall'Olio and Vakratsas (2023). In their work, they assessed the complex influence of advertising creative strategy on the elasticity of advertising. When developing an advertising strategy, they evaluate its effectiveness on an integrative basis, from the point of view of the content and execution of advertising creative. At the same time, the execution of advertising creative includes not only the direct form of providing advertising information, but also the use of creative templates to increase its effectiveness. It is the execution of advertising creative that is the point of contact of our research. Dall'Olio and Vakratsas (2023) prove that the empirical content of advertising messages has a significant impact on the elasticity of advertising. The approach proposed by us makes it possible to increase the variability of advertisements, and the use of templates

significantly reduces the labor costs of creators, reduces the time of development and launch of advertising campaigns, and increases the elasticity of advertising.

King et al. (2022) prove that consumer behavior is influenced not only by the format of presentation of advertising information, but also by options for its search by potential consumers. The implicit association test conducted by the researchers showed that consumers' search for goods by typing information is more likely to be action-oriented, indicating higher purchase intentions. Accordingly, providing complete information about the product in an advertising message using DOT meets the wishes of consumers as much as possible from the point of view of receiving the most complete information about the product and increases the likelihood of them making a purchase.

Today, companies are paying a lot of attention to various options for using artificial intelligence in communication with consumers (Bonetti et al., 2022; Grewal et al., 2021; Davenport et al., 2020). The use of information technologies makes it possible to increase the effectiveness of marketing investments. Plangger et al. (2022), based on their own et.al. research and the publications of other authors Mishra et al., (2022), argue that companies that use artificial intelligence in the practice of communication with potential clients are more successful in attracting attention of consumers, more profitable, have higher operational efficiency. The same studies (Mishra et al., 2022) confirm that the use of information technology opportunities allows to reduce the costs of advertising and marketing of the company as a whole. The process of developing advertising messages requires a lot of work and time. The use of artificial intelligence allows you to focus on other, more important aspects of the activity, freeing marketers from routine tasks. As pointed out by Plangger et al., (2022), “marketing mechanization can help effectively redistribute marketing human resources in a more meaningful and productive way, since secondary tasks are taken over by automated computer resources”. Thus, our study does not touch on issues related to the use of artificial intelligence in advertising.

Research Huang et al., (2021) addressed the issue of visual attention to goods in virtual space. The research is based on the fact that the virtual shopping environment is significantly different from the conditions of traditional stores in terms of visual images, stimuli and interference. On the internet, users not only look at the main product, but are also visually distracted by viewing other products that are not related to the purpose of purchase. This means that the visual images that fall into the user's field of vision compete for his attention. A higher probability of purchase is demonstrated by products that focus the visual attention of consumers on themselves, when there is no switching of attention to distracting products. Increasing visual attention to distracting factors reduces the accuracy of consumers' identification of the main product as a product that satisfies their needs. Therefore, how to optimally present the products on the page is important for retailers to increase their visual value. In our study, we did not focus on how to deal with distracting consumer factors.

The conducted study proves that the use of DOT makes it possible to solve problems that have become especially relevant today in connection with the development of digitalization of advertising: presenting the consumer with the most complete information about the product in one advertising message, focusing on it the attention of consumers, reducing the labor costs of marketers in the process of creating and publishing advertising messages, increasing the elasticity of advertising and its effectiveness.

The introduction of new, enriched images can significantly improve both of these indicators (CTR and CR). Several factors contribute to this. *Firstly*, the consumer sees a more appealing and more informative ad in comparison to similar ones at the same

placement on an ad platform and is more likely to click on it--the consumer receives all the necessary information without even clicking on the ad: if he is not interested in ad, he does not make the transition, if he is interested, then the transition to the site becomes more deliberate (since the consumer has already got the information about the main characteristics of the product), that is the likelihood that he will make a purchase or other useful action increases. *Secondly*, since the format of the product gallery is paid per the number of clicks, then, on the one hand, we reduce the number of misleading clicks to the advertiser's website, thereby saving the budget of the advertising campaign, and on the other hand, people who clicked through the ads are more inclined to buy, that is the return on ad spend (ROAS) indicator of the advertising campaign increases. *Thirdly*, this approach can be implemented on any platform that involves posting ads using feeds (Facebook, Instagram, Google, Twitter, Criteo, Adroll, VK, OK, with DPA (dynamic remarketing)) and DPA for wide audiences (Facebook), the principle of operation will be similar, only the parameters of the output images will differ, since they must comply with the technical requirements of the selected platforms.

In the process of work, we had to face a number of difficulties associated with obtaining information that underlies the study. Such information is confidential and protected by enterprises in every possible way. Today, every economic entity is in a competitive environment and is interested in bringing goods to the market as soon as possible, placing information about goods on the internet as soon as possible and of better quality, and therefore does not disclose information about promotion methods. The information that is used to conduct research, as well as the results of the research itself, quickly become obsolete in the context of digitalization. The secrecy of information about the use of advertising placement sites, and the rate of loss of relevance of information became an important limitation of this study. Another thing is that the middle management workers, who directly use the platform, do not want to share information about the efficiency of using it because it may cause them to lose their position due to the fact that it makes their work easier and more efficient thus they need less time to do it, or, as they believe and what are they are afraid of--whole feed management teams could be replaced with one or two workers.

## **Conclusion**

Thus, the introduction of new, enriched images (visual content) using the Dynamic optimization tool can significantly increase the performance of an advertising campaign in the field of e-commerce due to greater information content, an increase in ROAS and wide application on various online platforms. In the future, it is planned to study closer integration of the DOT with placement sites. This is a promising direction, as it will allow advertisers to manage advertising from one program, without the need to switch between the feed management tool and the advertising account, in which the advertiser manages his placement (indicates the goals of the advertising campaign, tactics for placing advertising materials, assigns a bid strategy, et cetera).

## **Conflict of Interest**

We certify that there is no conflict of interest with any financial, personal, or other relationships with other people or organization related to the material discussed in the manuscript.

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