Evaluation of the effectiveness of implementing artificial intelligence in the Google Advertising service

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Abstract

This paper examines the effectiveness of implementing artificial intelligence (AI) in the Google Ads advertising service. The study analyzes the advantages and disadvantages of AI integration, focusing on attribution models and end-to-end analytics. The findings show that traditional metrics, such as CTR, CPC, and ROI, used to evaluate advertising campaign performance, exhibit significant statistical errors when AI tools are applied, with errors reaching up to 35%, exceeding typical business margins. A comparative analysis in the construction industry highlights discrepancies of 10% to 35% between traditional and AI-driven models. The study concludes that universal AI algorithms often fail to account for industry-specific dynamics, leading to inaccurate evaluations. The practical significance of this research lies in proposing an alternative approach that combines traditional evaluation methods with AI-based tools, offering a more reliable framework for assessing campaign effectiveness.

Keywords: Efficiency; Artificial Intelligence; Advertising Service; Google Ads; Advertising

Introduction

In the era of rapid development of digital technologies and a highly competitive business environment, Internet advertising has become an important tool for implementing a successful marketing strategy for business. Its role in modern business goes far beyond traditional advertising of goods and services. Turning into a strategic element, advertising not only determines brand recognition, but also affects relations with the audience, creates advantages, and stimulates sales, directly affecting the efficiency and competitiveness of enterprises.

Today, the digital and internet advertising industry is high-tech and growing at a rapid pace. Artificial intelligence (AI) is the main factor influencing the development of advertising technology, as it is the central core of digital advertising platforms and services. However, practice shows that the complete replacement of the human factor in digital and Internet advertising does not always objectively lead to high efficiency in business development (Babenko et al., 2020). The main reason for the low effectiveness of advertising is that not all indicators of digital advertising platforms and services accurately reflect the real economic results of the business. Advertising platforms that rely on artificial intelligence technologies can provide analytics, but they do not always effectively influence business performance. Therefore, when using different technologies and models of artificial intelligence in the

practical activities of enterprises or when evaluating the effectiveness of marketing strategies, the question of AI implementation and evaluation of its effectiveness arises. One of the areas where artificial intelligence technologies are most actively used, covering various areas of business, is advertising services. In this context, the Google Ads advertising service stands out as the largest source of conversions in modern digital and Internet advertising.

The relevance of this area of research is also confirmed by the fact that the introduction of artificial intelligence technologies is taking place simultaneously in almost all business processes of enterprises related to financial flows. Given the closed nature of information systems and algorithms used by artificial intelligence technology, assessing the effectiveness and impact on the results of business processes is difficult.

The purpose of the research is to analyze the methodology for assessing the effectiveness of the implementation of artificial intelligence in the Google Ads advertising service and the formation of an alternative methodical approach to the evaluation of the effectiveness of advertising campaigns in digital advertising services (using the example of Google Ads), with further implementation using the example of one of the advertising campaigns.

Methodology

The methodological basis of the research is a set of general philosophical and special methods, principles, and methods, the main methodological approaches (systemic, process, and situational). General scientific methods: systematic approach - for substantiation of the metrics for assessing the effectiveness of advertising campaigns; analysis and synthesis - to determine trends and trends in the development of artificial intelligence; methods of theoretical generalization - to determine the disadvantages and advantages of traditional and alternative methods of evaluating the effectiveness of advertising campaigns using artificial intelligence technologies; terminological analysis - to identify and clarify terms that reveal the essence of evaluating the effectiveness of advertising campaigns in digital advertising services.

Specific research methods employed include statistical and analytical approaches to evaluate the effectiveness of advertising campaigns in the Google Ads digital service. This evaluation is based on a comparison of results obtained from traditional methods and alternative approaches utilizing artificial intelligence algorithms.

Results

The topicality of the issues made it necessary to determine the trends in the use of artificial intelligence. Currently, the implementation of artificial intelligence in Ukraine in various business processes is limited to the private sector, relying on foreign developments. Statistics show that artificial intelligence technologies of Ukrainian origin belong to foreign companies in terms of the implementation of intellectual property rights. However, the market for AI

research and development software is growing every year. According to LinkedIn, there are currently more than 2,000 software development institutions and companies specializing in artificial intelligence in Ukraine. Among them are such internationally recognized companies as Grammarly, Reface, and Ring Ukraine (SQUAD) (Everest-AI Review, 2018).

Artificial intelligence (AI) is one of the basic technologies of "Industry 4.0", which has a significant impact on digital transformation due to the action of the following three factors:

– Creation of big data: the rapid and continuous growth of which has affected the need for the development of technologies for their analysis and management;

- the rapid growth of computing power and the decrease in the cost of information allow the processing of large data sets of a significant number of users;

- Constant development of new algorithms for searching, analyzing, and using data.

Although artificial intelligence provides businesses and government organizations with opportunities to significantly improve productivity, developments in the field face significant and unique challenges. Algorithms and methods used by AI are designed for specific tasks and can be used exclusively for application in a specific field.

According to the results of the modeling of the potential economic impact of AI on 16 industries, conducted by Accenture in collaboration with Frontier Economics, the extent of AI technology adoption across various economic sectors becomes evident (Figure 1).
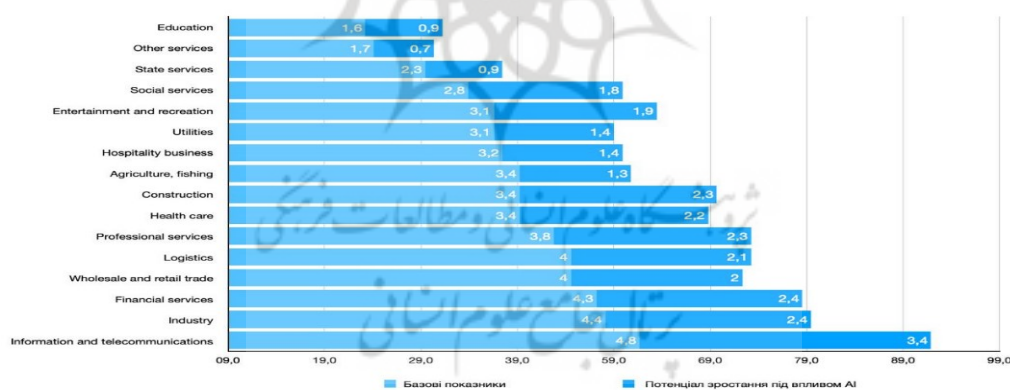

Figure 1. Annual growth rates of GVA with the integration of AI into economic processes in various industries until 2035 (Pizhuk O., 2019)

The growth of gross value added (GVA), which reflects the value of goods and services produced in a particular sector of the economy, was used as the evaluation criterion. The study results show that information and communication services, manufacturing, and financial services are the three sectors expected to experience the highest annual GVA growth rates due to AI integration into economic processes (4.8%, 4.4%, and 4.3%, respectively) by 2035 (Pizhuk, 2019). The most active pace of implementation of AI technologies is occurring precisely in marketing activities (McKinsey & Company, 2023).
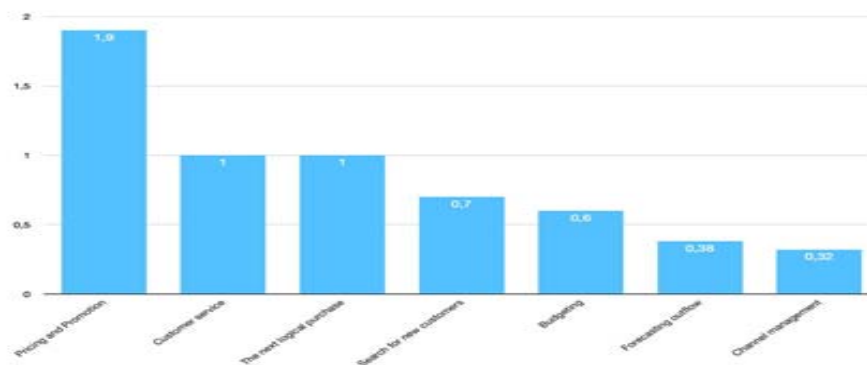
Figure 2. The impact of artificial intelligence on sales and marketing: 6 trillion. dol. (McKinsey & Company, 2023)

The implementation of AI in a company's marketing strategy can significantly increase the efficiency and accuracy of decision-making, as well as offer a more personalized approach to consumers.

The main tools of artificial intelligence used in the field of marketing and advertising include the following:

For text generation: ChatGPT, Jasper.AI, Writer, Copy AI, Grammarly, GrowthBar.

To create an image: Midjourney, DALL-E.

For video and audio editing: Synthesia, Descript.

For analytics and SEO optimization: LeadiQ, Fullstory, Surfer, Seventh Sense, Chatfuel, Meet Edgar.

These artificial intelligence tools offer comprehensive functions for conducting marketing activities, developing marketing and advertising strategies, and creating content. Using these tools makes it possible to use data more effectively, automate processes, and make coordinated decisions when developing and improving marketing strategies.

Authority Hacker conducted a study on the various applications of artificial intelligence in marketing and advertising (see Figure 3) (Authority Hacker, 2023).
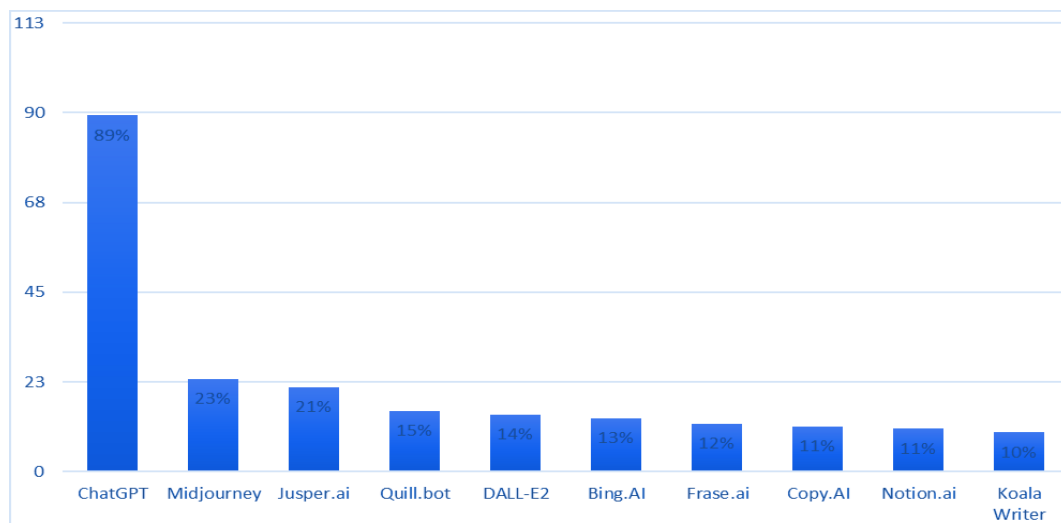
Figure 3. The most popular artificial intelligence tools (Authority Hacker, 2023)

Based on the above, the following possibilities of using artificial intelligence in marketing and advertising can be identified:

- Emotional personalization. Artificial intelligence is used to analyze customer emotions to create more emotionally resonant and engaging content.

- Predicting customer behavior. Artificial intelligence is used to predict customer behavior, improve targeting in advertising campaigns, and optimize marketing strategies.

- Decision-making automation. Artificial intelligence automates marketing decision-making processes such as budget optimization and A/B testing.

In this study, we will focus on the features of AI implementation in the Google Ads advertising service. Today, the Google Ads digital advertising service is more technically advanced, has sophisticated mathematical tools, and is complemented by the capabilities provided by the Google Analytics digital service. Such synergy allows you to use models to test data and form more accurate conclusions.

Google developers and business management representatives have created highly effective Google Ads artificial intelligence algorithms, which are designed to collect conversion data and encourage advertisers.

Since the involvement of artificial intelligence algorithms does not always lead to the achievement of the desired indicators of the effectiveness of advertising campaigns, the relevance of evaluating these algorithms based on the comparison of results obtained from AI-based systems and standard methods is growing. Google Ads is a system that combines not only modern Internet technologies but also an economic approach, ensuring a unified thinking of advertisers and businesses.

Google Ads is the leader among advertising systems for several reasons that determine its effectiveness and popularity among advertisers. Here are some key factors:

- Global audience. Google is the most used search engine in the world and also owns other popular services such as YouTube, Gmail, and Google Maps. This gives advertisers access to a huge global audience.

- High-quality search audience. Google's dominance in search allows ads to be shown at a time when users are actively searching for a solution and interested in an advertiser's product or service, resulting in high conversion rates.

- Budget flexibility. Google Ads offers advertisers the flexibility to set budgets, from small amounts for small businesses and startups to large ad campaigns for large corporations.

- Built-in artificial intelligence. Several tools collect data, learn, and make decisions on behalf of the user, saving time and delivering higher economic results.

- Integration with other Google platforms. Stands out for its integration with other popular Google platforms such as YouTube, allowing advertisers to run cross-platform campaigns in a unified effort.

- Reliable technical support. Google provides robust technical support to advertisers, helping to resolve technical issues and offering assistance in using the platform.

- Advanced analytical tools. Google Ads integrates with other analytical tools, such as Google Analytics, providing advertisers with detailed information about the performance of their advertising campaigns.

Overall, Google Ads offers a wide range of features, performance, and customization options, making it the best choice for many advertisers. Payment for traffic in the system is based on clicks, which are determined in an auction among advertisers - the traffic gets the one who makes a higher bid. Due to many additional factors, bid adjustments can be both manual and automatic, resulting in different strategies for managing advertising campaigns.

Let's highlight the main aspects of using artificial intelligence in Google Ads:

1. Collection and consolidation of data. Google Ads is data-driven because it is the basis for AI-powered decision-making.

2. Machine learning. Google Ads uses machine learning to predict which advertising strategies will be more effective under certain conditions. This allows you to automatically adapt campaigns to achieve better results.

3. Increasing the relevance of the ad. Artificial intelligence helps analyze past data and learn user behavior to improve ad relevance. Algorithms take into account interests, previous interactions, and context to optimize content.

4. Dynamic ads. Google Ads uses artificial intelligence to create dynamic ads that automatically adapt to website content and user interests. This helps keep your ads relevant.

5. Budget and campaign optimization. AI algorithms help allocate advertising budgets for maximum effectiveness. They automatically analyze the effectiveness of advertising resources and redistribute funds to achieve the greatest effect.

The main advantages of using artificial intelligence in Google Ads:

1. Automation of many business processes. AI algorithms automate the setup and optimization of advertising campaigns, increasing efficiency and saving time for advertisers.

2. Enhanced audience targeting. Thanks to neural networks and the collection of data from different platforms, Google can identify and find audiences more effectively compared to targeting based on predefined clusters.

3. Financial efficiency. Thanks to fast intelligent operations, AI achieves greater efficiency in decision-making, advertising maneuvering, and audience selection.

The main disadvantages of using artificial intelligence in Google Ads are:

1. Lack of perfect control. The automation of many processes has relegated human supervision to a secondary role, which raises concerns about the quality of advertising activity. Google recommends focusing only on the bottom line, which raises many questions about the quality of ads.

2. Focus on financial efficiency. Google often emphasizes financial metrics while obscuring many intermediate performance metrics, thus ignoring integrated marketing performance metrics.

3. Emphasis on web data, not business results. Google Ads focuses more on analytical performance indicators. AI algorithms are configured without an emphasis on business indicators, taking into account only business intelligence data.

Based on the above-mentioned features of the work of AI in the Google Ads digital service, the principles of the effectiveness of the use of analytics in Google Ads advertising campaigns were analyzed. Important aspects of analytics for evaluating the effectiveness of an advertising campaign are the following:

1. Setting indicators and goals (conversions). Defining specific metrics and goals allows analytics to focus on metrics that are most important to achieving business goals.

2. Use of Google Analytics. Integration with Google Analytics provides detailed analytical data about user behavior on the site. This helps measure conversions and ad engagement.

3. Monitoring of key performance indicators (KPI).

4. Attribution. Using conversion tracking and attribution models helps determine the contribution of each stage of user interaction to the conversion process.

5. In-depth data analysis. Thorough data analysis beyond Google Ads and Analytics, including real business sector analytics.

6. Evaluation of return on investment and final financial efficiency.

The above-mentioned aspects are fundamental in approaches to evaluating the effectiveness of advertising campaigns. Modern approaches to evaluating the effectiveness of campaigns in Google Ads are based on traditional approaches to setting up conversion analytics (Babenko et al., 2017a, 2017b, 2018; Hrabovskyi et al., 2020). This approach involves the use of recommended attribution models based on data, which are not always transparent and based on tuning tracking for the maximum number of conversions. And in this case, the evaluation of the effectiveness of advertising campaigns depends exclusively on Google Ads conversions. Thanks to these settings, Google developers provide the highest probability of effective work of artificial intelligence. This approach is used by more than 90% of Internet marketers, but it is not always transparent and objective.

Among the disadvantages of the traditional evaluation of the effectiveness of advertising campaigns in Google Ads, the settings should be determined exclusively on the conversion of Google Ads. The shortcomings of the traditional approach have influenced the methodology of evaluating the effectiveness of advertising campaigns and led to the development of alternative approaches to the organization of analytical systems that allow an understanding of the structure of targeted actions. In addition, alternative methods should include the use of metrics that link costs to outcomes. Based on this, the formation of an alternative method of determining the effectiveness of advertising campaigns in Google Ads was proposed, as a methodological approach for transparent analysis of the performance of artificial intelligence in advertising campaigns.

The proposed methodology of an alternative evaluation of the effectiveness of an advertising campaign in Google Ads is based on the use of attribution models and the development of basic cross-channel analytics. The purpose of this methodology is to create a system of objective performance analysis and to develop a framework that, regardless of artificial intelligence, will accurately reflect actual data.

The method of alternative evaluation of the effectiveness of the advertising campaign is built on several components that provide a synergistic effect that allows you to get an objective result. To formulate a methodology for alternative evaluation of the effectiveness of an advertising campaign in Google Ads, it is necessary to explain the following elements from the point of view of their functionality:

- Conversion attribution models or goal action crediting algorithms: These models determine how conversions are attributed to different channels, from the first visit to the completion of the goal action.

- The role of additional services such as Google Analytics and Looker Studio: these services provide comprehensive data and statistics that increase the accuracy of performance analysis.

- Cross-channel analytics reports: These reports offer a holistic view of the performance of all channels, combining data from multiple sources to provide a complete picture of advertising performance.

Let's consider the essence of conversion accounting attribution models. The attribution model for conversion accounting is an algorithm that tracks a target action from the first visit to the end. The attribution model defines the rules for attributing a conversion to a certain channel. Conversion accounting attribution models were developed to more fully and thoroughly analyze the effectiveness of advertising channels and understand the indirect effect of these channels on increasing conversions. There are several types of conversion attribution models, namely:

1. Last click attribution. This model assigns 100% value to the last interaction channel.

2. Attribution of the last indirect click. In this model, the conversion is attributed to the penultimate channel that led to the conversion.

3. Attribution of the last Google Ads click. This model assigns 100% value to the last Google Ads click that resulted in a conversion.

4. First click attribution. This model attributes the conversion to the channel that first introduced the customer to the website.

5. Linear attribution. Value is evenly distributed across all channels involved in communication from initial contact to conversion.

6. Attribution over time. In this model, value is distributed across channels increasingly from the first interaction to the point of conversion, with more recent interactions receiving more value.

7. Attribution based on position. In this model, the first and last channels each receive 40% of the value, and the rest of the value is distributed among the intermediate channels.

8. Data-driven attribution. The value of the conversion is distributed based on the statistics for the selected action (conversion). In this model, the actual contribution of each interaction is determined based on conversion data.

The data-driven attribution model is specifically recommended by Google developers for the effective functioning of artificial intelligence algorithms. They believe this model allows algorithms to collect data on the performance of each channel, rather than just one and splits a single conversion across multiple channels, which can mask the true performance of each channel. However, ad campaigns often show partial conversions (e.g. 0.5, 0.3, 1.2), which makes performance analysis much more difficult. Therefore, to objectively evaluate the data provided by Google Ads using a data-driven attribution model, it is important to create a transparent data model using last-click attribution. Until 2022, Google Ads operated on a last-click attribution model. However, with the development of artificial intelligence, the data-driven attribution model has become the default. The next element of the proposed methodical

approach to evaluating the effectiveness of advertising campaigns in Google Ads is the additional services of Google Analytics and Looker Studio. These digital services are necessary for the analysis of external data, in particular:

Google Analytics - collects data using the "Last Click" attribution model, which allows deciphering Google Ads conversions.

Looker Studio - serves as an infrastructure for creating a basic multi-channel analytical report with the ability to display conversions for each advertising campaign.

Using these services, we will build a basic model of cross-channel analytics, in particular the distribution of all conversions in all advertising campaigns. As a result, we will get not just the number of conversions for advertising campaigns, but also specific targeted actions for each campaign using the "Last Click" conversion attribution model. This will allow us to analyze those conversions that Google Ads claims were achieved thanks to the work of artificial intelligence using the "Data-Driven" attribution model.

The proposed model can be called a basic cross-channel analytical model. It is an analytical model that links a user's first action to their final action related to financial data.

We will give an example of the implementation of this model based on the calculation of the effectiveness of artificial intelligence in Google Ads campaigns. We will give an example of a basic model that decodes primary conversions into target actions of the enterprise.

Underscoring all of the above, our study of the effectiveness of artificial intelligence in Google Ads campaigns boils down to the creation of a basic model of cross-channel analytics in several subsequent stages. An account was taken as a basis, where only campaigns running on artificial intelligence algorithms are active, and we will analyze their effectiveness. The sphere of attention is an online building materials store.

The first stage. Get performance data from your Google Ads account and create a report. The process of creating a report in Google Ads involves creating a campaign report based on the following characteristics: campaign, clicks, impression, cost per click, CTR, cost, conversions, and conversion cost (Table 1).

The main performance indicators for companies using artificial intelligence are conversions and their cost, as these parameters are set in the settings of the advertising campaign. From the Table 1 attribution model to understand which campaign it can be seen that conversion numbers are not whole numbers that do not characterize anything significant, and the cost of conversion does not give any significant insight either. That's why we create a range of data for ad campaigns in Google Analytics using the Last Click conversion leads to a targeted action that is beneficial to the business.

Table 1. Report in Google Ads

Campaign	Cliques	Showings	CTR	CPC	Costs	Conversions	Conversion cost (CC)
Smart_All_Performance_Max	6153	370674	0,0166	1,75	10743,16	109,9	97,75
PMax_ Sealant _KYIV_UA_k	261	19097	0,0137	6,65	1735,93	2	867,96
PMax_ Drywall _KYIV_k	840	47616	0,0176	7,64	6416,94	20	320,85
PMax_ Primer _KYIV_k	327	23017	0,0142	5,25	1717,84	1	1717,84
PMax_ Glue _KYIV	2398	124536	0,0193	2,68	6436,29	23,85	269,86
PMax_ Paints_Laki _KYIV_UA_k	265	20304	0,0131	6,38	1691,37	2	845,69
PMax_ Minwata _KYIV_k	1037	47680	0,0217	6,18	6408,75	14,51	441,53
PMax_ Expanded polystyrene _KYIV_k	1557	73137	0,0213	4,11	6404,26	34,99	183,04
PMax_ Styrofoam _KYIV_UA_k	1386	66259	0,0209	4,64	6430,94	12,99	495,21
PMax_ Profile _KYIV_k	1624	95430	0,017	3,99	6477,69	14,5	446,74
PMax_ Ceiling _KYIV	2777	225185	0,0123	7,76	21541,26	49,56	434,63
PMax_ Ceiling _UA	3556	284424	0,0125	5,12	18211,68	31,71	574,37
PMax_ Strainer _KYIV_UA_k	306	19863	0,0154	5,64	1727,11	6	287,85
PMax_ Cement, crushed stone, sand _KYIV_k	715	48163	0,0148	9,12	6519,75	16,5	395,14
Pmax_ Putties _KYIV_k	1786	104216	0,0171	4,4	7857,5	22,73	345,72
PMax_ Plaster _KYIV	1273	89160	0,0143	5,07	6449,41	19	339,44
PMax_OSB_KYIV_k	1729	80213	0,0216	3,73	6441,79	22,99	280,15
Sales-Performance Max-1_k	1836	64288	0,0286	7	12858,85	72,82	176,58
In total	29826	1803262	0,0165	4,56	136070,5	477,06	285,23

The second stage. Consolidation of ad campaign performance data in Google Analytics using the Last Click conversion attribution model. Consolidation of data on the effectiveness of advertising campaigns in Google Analytics is achieved through synchronization between Ads & Analytics services thanks to automatic tagging of traffic, and UTM tags. These tags allow us to receive data in Google Analytics for advertising campaigns run in Google Ads. In the Google Analytics system, we create a study in which we set the following column parameters: Campaign, Events, and Conversions. As a result, we get the following report (Table 2).

We can see the distribution of events by advertising campaigns, thanks to which we can already understand the real effectiveness of each of the advertising campaigns.

Next, we need to correlate conversions in Google Ads with physical events in Google Analytics, which we will display in a report in Looker Studio.

Table 2. Report in Google Analytics

Campaign	binotel_gc_opened_passive_form	binotel_ct_call_details	binotel_ct_call_received	Purchase	Purchase	_call_requested	binotel_oc_chat_happened	binotel_oc_contact_received	form_calc_submit	In total	In total
The Google Ads campaign associated with the session	Number events	Number events	Number events	Number events	Value of events	Number events	Number events	Number events	Number events	Number events	Value of events
In total	229	172	172	101	172035.3	94	68	29	1	866	506035.3
▢Smart_All_Performance_Max	51	28	28	42	23780.52	12	13	6	0	180	76780.52
PMax_ Sealant _KYIV_UA_k	1	0	0	2	460	0	0	0	0	3	460
PMax_ Plasterboard _KYIV_k	7	11	11	2	687.72	2	4	1	0	38	17687.72
PMax_ Primer _KYIV_k	2	1	1	0	0	0	0	0	0	4	1000
PMax_Glue _KYIV	23	4	4	4	1698.66	8	2	1	0	46	15698.66
PMax_ Paints_Varnishes _KYIV_UA_k	2	0	0	1	424.92	0	1	1	0	5	1424.92
PMax_Minwata _KYIV_k	5	6	6	3	2073.72	2	0	0	0	22	10073.72
PMax_Expanded polystyrene _KYIV_k	14	11	11	9	45688.2	7	8	6	0	66	71688.2
PMax_Styrofoam _KYIV_UA_k	11	3	3	3	11294.46	7	0	0	0	27	21294.46
PMax_Profile _KYIV_k	2	11	11	1	23.52	1	0	0	0	26	12023.52
PMax_Ceiling _KYIV	21	15	15	9	14780.58	12	11	3	1	87	52780.58
PMax_Ceiling _UA	18	12	12	4	18991.38	9	7	4	0	66	46991.38
PMax_Strainer _KYIV_UA_k	2	5	5	1	278.52	0	0	0	0	13	5278.52
PMax_Cement, crushed stone, sand _KYIV_k	12	1	1	5	1664.46	6	2	2	0	29	10664.46
Pmax_Putties _KYIV_k	9	10	10	5	16066.2	6	1	0	0	41	33066.2
PMax_Plaster _KYIV	5	5	5	7	32401.3	2	1	1	0	26	40401.3
PMax_OSB_KYIV_k	13	10	10	0	0	4	3	1	0	41	17000
Sales-Performance Max-1_k	31	38	38	3	1721.14	16	15	3	0	144	70721.14

The third stage. Creating a basic end-to-end analytics report in Looker Studio. In Looker Studio, we create a report in which we synchronize Google Ads and Analytics data. Thus, opposite each advertising campaign were conversions from advertising and actual actions from analytics according to the "last click" attribution model (Table 3).

Table 3. Consolidated report in Google Ads and Google Analytics

Campaign	Data from Google Ads							Data from Google Analytics					Calculated data			
	Cliques	Showings	CTR	CPC	Costs	Conversions	Conversion cost (CC)	Event number	Event number	Value of events	Event number	Event number	Total number of actual conversions	Deviation of real transformations, %	Actual conversion cost	Conversion cost deviation %
Smart_All_Performance_Max	6153	370674	0,0166	1,75	10743,16	109,9	97,75	28	42	23780.52	12	13	95	15,68	113,09	-13,56
PMax_Sealant_KYIV_UA_k	261	19097	0,0137	6,65	1735,93	2	867,96	0	2	460	0	0	2	0,00	867,97	0,00
PMax_Plasterboard_KYIV_k	840	47616	0,0176	7,64	6416,94	20	320,85	11	2	687.72	2	4	19	5,26	337,73	-5,00
PMax_ Primer _KYIV_k	327	23017	0,0142	5,25	1717,84	1	1717,84	1	0	0	0	0	1	0,00	1 717,84	0,00
PMax_ Glue _KYIV	2398	124536	0,0193	2,68	6436,29	23,85	269,86	4	4	1698.66	8	2	18	32,50	357,57	-24,53
PMax_Paints_Varnishes_KYIV_UA_k	265	20304	0,0131	6,38	1691,37	2	845,69	0	1	424.92	0	1	2	0,00	845,69	0,00
PMax_Minwata_KYIV_k	1037	47680	0,0217	6,18	6408,75	14,51	441,53	6	3	2073.72	2	0	11	31,91	582,61	-24,22
PMax_Styrofoam_KYIV_k	1557	73137	0,0213	4,11	6404,26	34,99	183,04	11	9	45688.2	7	8	35	-0,03	182,98	0,03
PMax_Styrofoam_KYIV_UA_k	1386	66259	0,0209	4,64	6430,94	12,99	495,21	3	3	11294.46	7	0	13	-0,08	494,69	0,11
PMax_ Profile _KYIV_k	1624	95430	0,017	3,99	6477,69	14,5	446,74	11	1	23.52	1	0	13	11,54	498,28	-10,34
PMax_Ceiling_KYIV	2777	225185	0,0123	7,76	21541,26	49,56	434,63	15	9	14780.58	12	11	47	5,45	458,32	-5,17
PMax_Ceiling _UA	3556	284424	0,0125	5,12	18211,68	31,71	574,37	12	4	18991.38	9	7	32	-0,91	569,12	0,92
PMax_	306	198	0,0	5,64	1727,	6	287,8	5	1	278	0	0	6	0,00	287,8	0,00

Strainer _KYIV_UA_k		63	154		11		5			.52					5	
PMax_ Cement, crushed stone, sand _KYIV_k	715	481 63	0,0148	9,12	6519,75	16,5	395,14	1	5	166 4.4 6	6	2	14	17,86	465,70	-15,15
Pmax_ Putties _KYIV_k	1786	104 216	0,0171	4,4	7857,5	22,73	345,72	10	5	160 66.2	6	1	22	3,32	357,16	-3,20
PMax_ Plaster _KYIV	1273	891 60	0,0143	5,07	6449,41	19	339,44	5	7	324 01.3	2	1	15	26,67	429,96	-21,05
PMax_OSB_ KYIV_k	1729	802 13	0,0216	3,73	6441,79	22,99	280,15	10	0	0	4	3	17	35,24	378,93	-26,07
Sales-Performance Max-1_k	1836	642 88	0,0286	7	1285 8,85	72,82	176,58	38	3	172 1.1 4	16	15	72	1,14	178,60	-1,13
In total	2982 6	180 326 2	0,0165	4,56	1360 70,5	477 ,06	285,23	172	101	172 035 .3	94	68	435	9,67	312,81	-8,82
	2982 6	180 326 2	0,0165	4,56	1360 70,5	477 ,06	285,23									

The result is Table 3, which displays the following information: the effectiveness of advertising campaigns as reported by the Google Ads dashboard, the effectiveness based on the "last click" attribution model from Google Analytics, and the corresponding calculation data.

Based on the received data, the following indicators were calculated:

- Actual conversions according to Google Analytics. The total number of actual conversions according to Google Analytics is the sum of conversions for important events that are registered as conversions in Google Ads.

- Percentage deviation in conversion data. This percentage shows the difference between the number of conversions recorded by Google Ads and the actual conversions recorded by Google Analytics. A positive value indicates over-reporting of Google Ads, while a negative value indicates under-reporting. Deviation in percentage of conversion data between Google Ads and Google Analytics, calculated by formula (1):

$$\mathrm{AC}D = \frac{Google\ Ads\ Conversions - Total\ Actual\ Conversions}{Total\ Actual\ Conversions} * 100\% \tag{1}$$

- Actual Cost per Conversion. This metric calculates the cost of each conversion based on Google Analytics data. This helps to assess how effectively the budget is spent on achieving conversions. Actual price per conversion according to Google Analytics, calculated by formula (2):

$$Actual\ Cost\ per\ Conversion = \frac{Google\ Ads\ Costs}{Total\ Actual\ Conversions} \tag{2}$$

- Cost per Conversion Deviation. This percentage shows the difference between the cost per conversion reported by Google Ads and the actual cost per conversion calculated by Google Analytics. Deviation in the percentage of the price per conversion between Google Ads and Google Analytics, calculated by the formula (3):

$$Cost\ per\ Conversion\ Deviation =$$
$$\frac{Google\ Ads\ Cost\ per\ Conversion - Actual\ Cost\ per\ Conversion}{Actual\ Cost\ per\ Conversion} * 100\% \tag{3}$$

Based on the obtained data, conclusions were made about the quality of artificial intelligence in Google Ads and directions for further work with it.

The fourth stage. Formulation of conclusions based on actual data about the effectiveness of artificial intelligence in Google Ads and an overview of the prospects of this topic. The created reports allow you to draw the following conclusions about the discrepancies between Google Ads and Google Analytics data:

- There is a major discrepancy in conversions - Google Ads reports 477.06 conversions and Google Analytics reports 435. This is a relative difference of 10%, and for individual campaigns, the difference can be as high as 35%, which is significant.

- There is a serious discrepancy in the price per conversion — Google Ads reports $285.23. US, and Google Analytics - $313. This is a 9% difference, and for individual campaigns, this difference can be as high as 26%, which is also significant.

Given that the average margin for trading campaigns can range from 5% to 20%, discrepancies of up to 35% in actual data are quite significant, creating certain financial risks for the business.

It should also be noted that these are interim performance data and not final, as not all customer interactions may lead to orders in the real business sector. Based on the above, the following general conclusions can be drawn:

- The "data-driven" attribution model is not reliable for accurately understanding the effectiveness of advertising campaigns.

- The effectiveness of artificial intelligence is questioned, as there are discrepancies in the data of up to 35%, which exceeds the average rate of return for business.

Discussion

Problems of the development of artificial intelligence and its implementation in various spheres and sectors of the economy have been studied by many foreign scientists. First of all, this problem was substantiated by many scientists-laureates of the Nobel Prize. Herbert A. Simon (Simon H., 2019), received the Nobel Prize in Economics in 1978 for pioneering

research into the decision-making process in economic organizations. His book Artificial Sciences explores the interaction between human cognition and artificial intelligence.

Another laureate of the Nobel Prize in Economics in 2001 is D. Stiglitz, known for his research in the field of information asymmetry and public welfare economics (Korinek & Stiglitz, 2017). Recently, he has also focused on the study of technologies, particularly artificial intelligence, and its impact on the economy and society. Although his research on AI is part of a broader study of economic and social change, his ideas play an important role in understanding the economic implications of AI implementation.

Stiglitz (Korinek & Stiglitz, 2017) investigates the consequences of introducing AI into economic systems, focusing on three main issues: the impact of AI on income distribution and deepening inequality, the risk of wealth concentration in the hands of technology owners through automation, and proposals for social policy as a system to regulate these processes.

Nobel Prize-winning scientists have conducted fundamental research on the impact of AI on economic development and the risks posed by its implementation. However, the use of AI technologies in marketing and advertising is a relatively new area of research. Scholars who explored the challenges of implementing AI in marketing and advertising examined both theoretical and applied aspects of AI technologies.

For example, Kotler (Kotler et al., 2016) describes new trends in marketing, particularly the impact of digital transformation and AI on marketing strategies. Stern (Sterne, 2017) offers practical advice and examples of using AI in marketing activities, exploring how intelligent systems can address various marketing tasks. Pradeep (Pradeep et al., 2019) examines AI's role in marketing, with a focus on trend forecasting, customer communication, and sales.

Ukrainian scientists are also engaged in researching marketing strategies, including those based on the capabilities of artificial intelligence. For instance, Oklander and Chukurna (2020) propose a methodological approach that incorporates the informational component when determining the price of goods and services. They explore the potential for further AI development and address the challenges in valuing products and services that incorporate AI technologies.

Nestorenko and Nestorenko (2022) examine AI as a factor in optimizing production solutions under conditions of limited resources and societal priorities. Androschuk (2019) focuses on trends in AI technology development, while Skytsko et al. (2023) categorize the threats and risks associated with AI use. Research by Batareev (2021), as well as Utkina and Shcherbak (2021), outlines theoretical and methodological approaches to defining AI.

Many foreign and Ukrainian scholars view AI primarily as a technology that poses certain risks in cyberspace and information security. Kabbas, Alharti, and Munshi (2020) examine AI's impact on cybersecurity, while Ukrainian researchers Savchenko and Shapovalenko

(2020) explore the main applications of AI in cyberspace and cyber defense. Shevchenko (2023) synthesizes various directions in which AI technologies are applied.

Despite numerous studies of trends in artificial intelligence technologies, the issue of using artificial intelligence in marketing activities, in particular in creating effective marketing and advertising campaigns and developing marketing strategies for business, remains insufficiently covered. The results of using standardized algorithms for evaluating the effectiveness of advertising campaigns in artificial intelligence systems and their evaluation based on traditional methods using marketing metrics show significant discrepancies. That actualizes the issue of forming alternative methodical approaches to evaluating the effectiveness of advertising campaigns with the help of artificial intelligence in digital advertising services (using the example of Google Ads). This makes research in this field both theoretically and practically relevant. In addition, the complex and interdisciplinary nature of this issue, as well as dynamic changes in the field, undoubtedly determine the need for further scientific research.

The implementation of artificial intelligence (AI) technologies in the field of marketing and advertising is accompanied by the problem of the reliability of the obtained estimates and results of the effectiveness of advertising campaigns. The choice of metrics to assess the effectiveness of AI implementation and the significant discrepancies in the data presented remain controversial issues. In addition, there are problematic areas in the allocation of the budget for advertising campaigns when using AI technologies. The inevitable issue is the emergence of risks associated with the complete entrustment of AI to the management of advertising campaigns and advertising budgets. This research presents the challenge of using attribution models to track conversions that work most effectively with AI in advertising. Proposals regarding the use of alternative methods of evaluating the effectiveness of advertising campaigns have been formulated. However, the issue of transparency of the work of AI algorithms for advertisers, including in the Google Ads advertising service, remains insufficiently developed. Sources of potential financial risks when using AI in the management of advertising campaigns become a controversial issue. This creates the problem of developing strategies to minimize financial risks when using AI in the management of advertising campaigns. This issue was also partially considered by the authors of this study.

There is no doubt that the introduction of AI technologies affects the ethical issues of interaction and management of consumer behavior, which is reflected in the formation of advertising strategies and advertising budgets.

All the above-mentioned questions regarding the introduction of AI and the evaluation of its impact on the effectiveness of the Google Ads advertising service were carefully considered by the authors of the article when forming the methodology for an alternative evaluation of the effectiveness of the advertising campaign.

Conclusion

This study presents a methodological approach to evaluating the effectiveness of implementing artificial intelligence in Google Ads campaigns. Analysis of trends in the implementation of artificial intelligence in various sectors of the economy showed that the growth of the online advertising market for business and the dynamic development of the implementation of artificial intelligence technology in this field are accelerating.

The market for advertising technologies based on AI is developing rapidly. Advertisers are increasingly required to interpret and rely on the estimates and calculations provided by artificial intelligence. These discrepancies highlighted the need for further research on this issue.

Theoretical and practical research made it possible to draw the following conclusions:

- AI algorithms have their performance evaluation formulas that differ from traditional approaches.

- The initial performance indicators often differ from the results provided by artificial intelligence by up to 10% in the end, and in some advertising campaigns, the discrepancy can reach 35%. This raises doubts about the effectiveness of AI in Google Ads campaigns.

- Using exclusively AI performance evaluation algorithms increases financial risks for companies, as deviations in calculations can reach 35%.

In the future, it will be possible to conduct a more in-depth study involving real data from different business sectors.

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Conflict of interest

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