

dynamic and agile response capability. This synergy harnesses the cognitive prowess of AI algorithms, enabling a proactive stance against potential vulnerabilities, threats, and malicious activities within the intricate network of digital transactions.

Moreover, the integration of AI engenders an environment of continuous vigilance and responsiveness. The AI-powered systems not only detect and neutralize threats but also evolve and adapt in real-time, marking a significant departure from conventional reactive security measures. This real-time adaptability forms a formidable shield, dynamically adjusting security protocols and responses in tandem with the evolving threat landscape.

Conclusively, this innovative fusion of AI within adaptive security frameworks heralds a new era in the protection of Central Bank Digital Currencies, instilling a sense of confidence in the reliability and resilience of these financial assets. It promises a proactive, agile, and ever-evolving defense system, essential in safeguarding the integrity and stability of the evolving digital financial ecosystem.

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DIGITALIZATION AND INTERNET ADVERTISING IN BUSINESS ACTIVITIES: PERFORMANCE INDICATORS

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The digital transformation of entrepreneurship and society as a whole requires new approaches to the organization of business and the introduction of information technologies in all spheres of life. Under such conditions, access to necessary information resources is significantly simplified and information about goods (services) is distributed accordingly. The majority of potential buyers get information about products on the Internet. Their share is constantly increasing.

The bulk of Internet visitors are relatively young people with above-average incomes, i.e., a very attractive population category for advertisers. Compared to traditional advertising, Internet advertising has differences. First of all, the differences lie in the possibility of automation, in-depth and operational analysis of advertising activities. Based on modern computer technologies, Internet advertising provides an opportunity to accurately and quickly evaluate the effectiveness of an advertising campaign of a business structure [1, 2]. The promptness of changes in advertising measures allows you to provide timely information about new goods and services, change the price, etc.

Feedback with the user of Internet content, the possibility of receiving and processing the client's reaction is important. The high quality of contact with the target audience allows you to automatically accumulate information about customer interests, identification characteristics, etc.

When choosing means of Internet advertising, it is necessary to take into account the main goal and task of the functioning of the business structure (table 1).

Table 1 – Dependence of means of Internet advertising on the set goals and tasks of the business structure

Tasks and goals	The main means of advertising in Internet
Creating a positive image of the company	www-- resource, banner advertising
Provision of available information	News group, e-mail, www- resource
Output of available information	News group, e-mail, www- resource; banner advertising
Bringing a new product and service to the market	e-mail, banner advertising
Attracting new potential customers	e-mail, banner advertising
Increase in sales	www- resource, banner advertising

Based on this, the main methods of advertising on the Internet are: server registration on search engines; placement of free links to the server in web directories; placement of links in "yellow pages"; registration at themed Jump Stations; placement of links on other servers; placement of color advertisements on well-visited servers, etc. [3].

However, no less important is the indicator of the effectiveness of Internet advertising, which is significantly different in its essence from the effectiveness of other types of activities. For the latter, efficiency is calculated as the ratio of the amount of profit to the amount of total costs. Indicators of the effectiveness of advertising activities with the use of information technologies also have a relative nature, which sufficiently reflects the objectivity of the impact on the audience [4]. Such indicators are given in table. 2.

To analyze the effectiveness of an advertising campaign on the Internet, it is necessary to obtain the most accurate, detailed and extensive data.

Table 2 – Indicators of the effectiveness of Internet advertising

Indexes efficiency	Calculation method
<i>Relative indicators</i>	
<i>CTR</i> (<i>coefficient traffic</i>)	The ratio of the number of clicks on an advertisement (clicks) to the number of impressions of this advertisement, expressed as a percentage).
<i>CTB</i>	The ratio of the number of visitors to a commercial Web resource attracted by advertising and making a purchase to the total number of visitors attracted by advertising.
<i>CTI</i>	The ratio of the number of visitors to a commercial Web resource, attracted by advertising and interested in the server, to the total number of visitors attracted by advertising.
<i>Auxiliary indicators</i>	
<i>AD Impression</i>	The total number of impressions of a particular banner made by a website or a publisher during a certain time.
<i>AD Reach</i>	The number of unique users to whom the banner was shown (excluding repeat ad hits) during a given time.
<i>AD Frequency</i>	The average frequency of showing an advertiser's banner to one user.
<i>Indicators for Internet advertising pricing</i>	
<i>FFA</i>	Hourly payment without taking into account the number of impressions and feedback from the audience.
<i>CPM</i>	The price is calculated relative to a thousand impressions of the advertising medium.
<i>Indicators of economic efficiency</i>	
<i>CPC</i>	The ratio of advertising costs to a thousand clicks on an advertising unit.
<i>CPV</i>	The ratio of advertising costs to the number of attracted visitors
<i>CPA</i>	The ratio of advertising costs to the number of actions of interest to the advertiser and visitors engaged in advertising.
<i>CPB</i>	The ratio of advertising costs to the number of purchases made by involved customers. Accounting is carried out not only the fact of making purchases, but also the amount of purchases
<i>CPB</i>	The ratio of advertising expenses to the number of visiting buyers attracted by advertising who selected a product and placed an application or order.
<i>CPE</i>	The ratio of advertising costs to the number of advertising appeals that actually reached the consumer.
<i>CPUU</i>	The ratio of ad spend to the number of unique users who saw the ad (excluding repeat ads).
<i>Effective frequency</i>	The optimal value of the frequency of impressions of an advertising appeal, when the advertising appeal reaches a significant share of the target audience of the Web resource. The number of impressions on average per user is considered sufficient to make a decision about whether or not to use the service or product that is offered.

The main methods of data collection can be the following:

- collection of statistical data by technological monitoring (log files server, visit counters, etc.);
- receiving data from Web publishers (schedule and type of advertising placement, indicators of AD Exposure, AD Reach, AD Frequency, AD Impression, CTR);

-sociological surveys among Internet users, professional data research agencies;

-receiving additional data about visitors (registration data, filled-in questionnaires, identification using cookies linked to geographic databases, etc.);

- receiving data within the advertiser's company.

Most often, they use programs for collecting statistics (visit counters), which can be set on a separate page or located on all pages of the site.

It is believed that there are two directions for evaluating the effectiveness of advertising: communicative or informational efficiency advertising that allows to establish how effective a specific advertising appeal is in conveying the necessary information to the target audience and economic efficiency, what is determined by the ratio between the result from advertising and the amount of material and financial costs for it for a fixed period.

The main criterion for the communicative effectiveness of advertising is index awareness of AW, which is equal to the ratio of the number of users who know about the content of advertising to the total volume of the target audience. Indicators characterizing economic efficiency include: amount orders for goods or services, depth of interest, percentage of returns, feedback.

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PRACTICAL APPLICATION OF MATHEMATICAL METHODS IN THE FORMATION OF A CYBERSECURITY SYSTEM AT THE ENTERPRISE

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In recent years, the information space of Ukraine has been developing and implementing the latest services, technologies, channels, platforms, online products and online services that reduce transaction costs and improve the standard of living of society. At the same time, the risk of security of one's own information system is growing due to constant attempts of cyberattacks and cybercrime related to access to personal information and data on confidential transactions. The number of such cyberattacks has been steadily increasing in recent years and poses a real threat to the stable functioning of your own information system. While more than 1,100 cybercrimes were recorded in Ukraine in the last four months of 2021, more than 2,194 cyberattacks were registered in Ukraine in 2022, 1/4 of which targeted government institutions. In modern scientific research, much attention has been paid