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DEVELOPMENT OF DIGITAL ACCOUNTING TOOLS AND THEIR INTEGRATION INTO MARKETING ACTIVITIES

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РОЗВИТОК ЦИФРОВИХ ІНСТРУМЕНТІВ ОБЛІКУ ТА ЇХ ІНТЕГРАЦІЯ В МАРКЕТИНГОВІЙ ДІЯЛЬНОСТІ

The purpose of the study is to identify the specifics of digital technology development and its impact on the transformation of the logic of information interaction between accounting and marketing systems. The conducted research made it possible to establish that the development of digital technologies significantly changes the logic of information interaction between accounting and marketing systems. The interaction logic is increasingly based on the use of a data organization system, where all participants in business processes have access to integrated, coordinated, and up-to-date information (or a single information field), allowing management decisions to be made in real time. The results of the study revealed that the key areas in which digital technologies change the logic of information interaction between accounting and marketing systems are as follows: automation of accounting processes, which creates a single information field that allows marketers to quickly assess campaign effectiveness and adjust strategies; integration of accounting and marketing data, which establishes a unified information field where accounting and marketing become interconnected; enhancement of data usefulness through analytics and forecasting, creating a single information field where accounting and marketing data enable well-founded management decisions; and flexibility in managing processes for meeting and shaping consumer needs, which forms a unified information field where marketing teams can adapt their projects to current financial and operational

indicators in real time. It has been demonstrated that the aforementioned changes in the logic of information interaction between accounting and marketing are triggered by the systematic convergence of four processes, namely: the development of digital platforms and technologies; the growth of data volume and processing speed; competitive pressure in the market; and the transformation of the role of accounting. These processes give rise to a new quality of information interaction, in which accounting and marketing function as a single system rather than as isolated functions. The practical value of the study lies in the development of recommendations for effectively managing risks associated with the digital integration of accounting and marketing systems.

Метою дослідження є ідентифікація специфіки розвитку цифрових технологій та їх впливу на трансформацію логіку інформаційної взаємодії між системами обліку і маркетингу. Проведене дослідження дало змогу встановити, що розвиток цифрових технологій суттєво змінює логіку інформаційної взаємодії між системами обліку і маркетингу. Логіка взаємодії все частіше базується на використанні системи організації даних, де всі учасники бізнес-процесів мають доступ до інтегрованої, узгодженої та актуальної інформації (або єдине інформаційне поле), що дозволяє приймати управлінські рішення у режимі реального часу. За результатами дослідження з'ясовано, що ключовими напрямами за якими цифрові технології змінюють логіку інформаційної взаємодії між системами обліку і маркетингу є: автоматизація облікових процесів, яка створює єдине інформаційне поле, що дає змогу маркетологам швидко оцінювати ефективність кампаній та коригувати стратегії; інтеграція даних обліку та маркетингу, що створює єдине інформаційне поле, де облік і маркетинг стають взаємопов'язаними; підвищення корисності даних через аналітику та прогнозування, що створює єдине інформаційне поле де дані обліку та маркетингу дозволяють приймати обгрунтовані управлінські рішення; гнучкість управління процесами задоволення та формування потреб споживачів, що створює єдине інформаційне поле де маркетингові команди отримують можливість адаптувати свої проєкти під актуальні фінансові та операційні показники в реальному часі. Доведено, що окреслені вище зміни логіки інформаційної взаємодії між обліком і маркетингом запускаються через системне накладення чотирьох процесів, зокрема: розвиток цифрових платформ і технологій; зростання обсягу даних і швидкості їх обробки; конкурентний тиск на ринку; трансформація ролі обліку. Через ці процеси формується нова якість інформаційної взаємодії, де облік і маркетинг функціонують як єдина система, а не як ізольовані функції. Практична цінність дослідження полягає у розробці рекомендацій щодо ефективного управління ризиками цифрової інтеграції систем обліку та маркетингу.

Key words: logic of information interaction; strategy synchronization mechanisms; marketing; real-time operational indicators; accounting and marketing systems.

Ключові слова: логіка інформаційної взаємодії; механізми синхронізації стратегій; маркетинг; операційні показники в реальному часі; системами обліку і маркетингу.

PROBLEM STATEMENT

In the modern business environment, data has become a resource comparable in value to capital or technology, as its effective use enables the prediction of market trends, optimization of business processes, and the creation of personalized offers for consumers. However, the mere availability of data does not guarantee a competitive advantage-the decisive factor is the ability to collect, structure, and apply it. In fact, what matters is how much money a company can save or earn through the use of data.

It is precisely at the intersection of accounting and marketing that the need arises for digital tools (software and analytical solutions) capable of ensuring effective data utilization, relying on the accuracy of accounting processes and the flexibility of management decisions. Modern digital systems transform accounting from a function of retrospective recording of events into an active component of strategic management.

Up to 70% of large business entities (for example, Amazon, Microsoft, Coca-Cola, Nestle, SAP clients) have already transformed their accounting systems. In medium-sized businesses, approximately 30—50% of entities partially implement new software and analytical solutions that enable the integration of marketing activities with accounting-the transformation is ongoing, but a clear trend toward digitalization is observed. Small businesses remain the least digitally adapted; however, fewer than 20% of companies use separate accounting or marketing software and analytical solutions without deep integration.

Table 1. Directions and specifics in which digital technologies change the logic of interaction between accounting and marketing

Directions of change in the logic of interaction between accounting and marketing	Specifics of changes in the logic of interaction between accounting and marketing
Automation of accounting processes	Modern digital platforms allow the collection and processing of financial and marketing data in real time.*
Integration of accounting and marketing data	Contemporary CRM systems, ERP platforms, and analytical tools enable the consolidation of financial, operational, and marketing data.**
Enhancement of data usefulness through analytics and forecasting	Digital technologies provide access to predictive analytics and artificial intelligence tools, offering options to evaluate the potential impact of marketing decisions before their implementation.***
Flexibility in managing processes for identifying, meeting, and shaping consumer needs	Accounting ceases to be merely a reporting tool and becomes a mechanism for supporting strategic decisions. As a result, businesses can quickly adjust market research methods, product offerings, sales channels, and communication strategies to remain efficient and competitive without wasting time and resources on rigid, outdated procedures.****

Note:

* This creates a unified information field, enabling marketers to quickly evaluate campaign effectiveness and adjust strategies.

** This creates a unified information field where accounting and marketing become interconnected: financial indicators influence the planning of marketing activities, and marketing campaigns are immediately assessed using accounting metrics.

*** This creates a unified information field where accounting and marketing data allow for well-founded managerial decisions based on predictive models, minimizing risks and optimizing costs even before marketing campaigns are launched.

**** This creates a unified information field where marketing teams can adapt their projects to current financial and operational indicators in real-time.

Source: compiled based on [1—2; 4—5].

In all cases, the level of integration between accounting platforms and marketing tools determines the extent of capabilities for adaptive interaction with the dynamics of consumer needs in real time.

ANALYSIS OF RESEARCH AND PUBLICATIONS

The issues of digital technology development in accounting and marketing have been studied by a significant number of domestic economists. In particular, the works of Shmatkovska T. O., Dzyamulich M. I. [6], Ryabova T., Ryabov I., Vovchanska O., Li T., Saienko V. [4], Andrusyak V. M., Khoroshylova I. O., and Smirnova N. V. [1] address the digitalization of accounting, the implementation of ERP and BI systems, and the integration of accounting platforms with marketing tools. Kulinich M. B., Matviychuk I. O., Safarova A. T., and Herasymenko T. O. [2] studied the specifics of applying analytical technologies and artificial intelligence in data management, as well as the challenges of business adaptability in the digital economy.

At the same time, the issues of digital technology development that transform the logic of interaction between accounting and marketing remain insufficiently explored in the scientific literature, which underscores the relevance of further research in this area.

FORMULATION OF THE ARTICLE'S OBJECTIVES

The purpose of this study is to identify the specifics of digital technology development and its impact on transforming the logic of information interaction between accounting and marketing systems.

THE PAPER MAIN BODY

Within the scope of the study, it is emphasized that the logic of information interaction between accounting and marketing refers to the manner and order in which these two systems exchange information and coordinate their actions to achieve the company's strategic objectives (for example, improving resource management efficiency, increasing revenue and profitability, reducing commercial risks, etc.). Simply put, it is how accounting data influences marketing decisions and, conversely, how marketing data guides accounting processes.

Such a logic is important due to its direct impact on the format of marketing activities (the structure, organization method, and channels of marketing processes [5—6]), as well as the utilization of available resources. Accounting tracks finances, expenses, and profits, while marketing plans advertising campaigns and the specifics of promoting goods and services.

We agree with the view of Kulinich M. B., Matviychuk I. O., Safarova A. T., and Herasymenko T. O. that when these processes are not interconnected, a business entity may spend money inefficiently or miss opportunities to maximize profit [2]. Furthermore, if the marketing system receives up-to-date accounting data (on profits and campaign profitability), it can adjust the structure, organization, and channels of marketing processes quickly and accurately. In this context, the logic of interaction determines which data should be transmitted, when, through which channels, and in what form to ensure well-founded decision-making.

Currently, such interaction is considered established; however, the development of digital technologies conti-

Process of digital platform and technology development
Effect: Accounting data becomes accessible to different departments (according to existing access levels).

Process of data volume growth and processing speed
Effect: The increase in data volume requires flexible systems that integrate accounting and marketing.

Result of the changes: A new quality of information interaction — interactive, prompt, and adaptive collaboration between accounting and marketing.

Systemic overlay of change processes resulting from the development of digital accounting tools

Features of information interaction: unified database, real-time data processing, flexibility and adaptability, transparency and controllability of data.

Process of competitive market pressure
Effect: Companies are forced to respond quickly to customer needs and optimize costs, which is impossible without digital integration.

Process of accounting role transformation
Effect: Accounting no longer merely records the past but becomes a tool for forecasting, analysis, and supporting marketing decisions.

Figure 1. Illustration of the systemic effects of processes that change the logic of information interaction between accounting and marketing systems of a business entity

Source: compiled based on [2—3; 6].

nuously changes its nature, transforming accounting from a retrospective tool for recording facts into an active mechanism for planning, promoting, and selling products or services. In particular, within this interaction, mechanisms for synchronizing strategies across various areas — resource management, research and development, marketing, logistics, finance, innovation, and others-are formed, ensuring the alignment of marketing and other business activities.

This is significant because launching a large-scale advertising campaign requires precise budget planning, and financial, innovation, and other forecasts must take into account the expected impact of marketing actions. Moreover, the development of such information interaction lays the groundwork for business adaptability, which is essential in conditions of rapid market changes.

The logic of interaction increasingly allows accounting and marketing to work with a single information base, making decisions in real time [1—2].

Recent studies show that this change in the logic of information interaction between accounting and marketing systems occurs due to the systematic automation of accounting processes, data integration, enhancement of data usefulness through analytics and forecasting, and the flexibility in managing processes for identifying, meeting, and shaping consumer needs.

The directions and specifics by which digital technologies change the logic of information interaction between accounting and marketing systems are described in more detail in Table 1.

Directions of change in the logic of interaction between accounting and marketing Specifics of changes in the logic of interaction between accounting and marketing.

It should be noted that the aforementioned changes in the logic of information interaction between accounting and marketing occur through the systemic interplay of four key processes, namely [1—2]:

— the development of digital platforms and technologies;

— the growth in data volume and processing speed;

— competitive market pressure;

— the transformation of the role of accounting.

An illustration of the systemic effect of the processes that change the logic of information interaction between a business entity's accounting and marketing systems is presented in Figure 1.

The result of the systemic overlay of the above processes is the development of digital accounting tools, which create a new quality of information interaction where accounting and marketing function as a unified system rather than as isolated functions [2]. Features of this new quality of interaction include data exchange within a single database, real-time data processing, flexibility and adaptability of analytical processes, as well as transparency and controllability of information.

The focus is on changes in the logic of information interaction between accounting and marketing through modern software and analytical solutions, which allow for the collection, processing, and analysis of financial and marketing data within a unified information space (Table 2). Thus, the development of digital platforms and technologies ensures high accessibility of accounting data and their integration across different departments of an enterprise. Modern information systems, such as ERP systems (e.g., SAP Business Technology Platform), CRM platforms (e.g., Salesforce), as well as analytical platforms (e.g., Tableau, Qlik, Power BI, Zoho Analytics), enable the consolidation of financial, operational, and marketing data within a unified information space.

This facilitates real-time information exchange, ensures consistency of decisions, and allows monitoring the effectiveness of marketing campaigns in real time. For example, using Power BI or Tableau, the finance departments of Rezi's Hotel and Radisson Blu Resort, Bukovel (Ukraine) can immediately see the impact of a marketing campaign on profits. Thanks to such integration, accounting ceases to be merely a retrospective tool for recording facts and becomes an active mechanism supporting strategic management, enhancing the flexibility and adaptability of the business to changes in market conditions.

The growth in data volume and processing speed creates a need for flexible systems that can integrate accounting and marketing. Modern digital platforms, such as ERP systems and BI analytics platforms, enable the collection of large volumes of financial, operational, and marketing information. For example, the Ukrainian company Rozetka utilizes integrated platforms, such as SAP and Power BI, to simultaneously analyze financial and marketing data. Marketing automation systems and analytical modules with artificial intelligence and forecasting capabilities allow processing this data in real-time and provide consistent analytical insights for different departments. Indeed, the Ukrainian online retailer Comfy.ua utilizes integrated platforms to consolidate data on subscribers, views, and marketing campaigns, enabling demand forecasting, optimizing advertising budgets, and personalizing offers for different customer segments. This approach ensures prompt decision-making, efficient

Table 2. Software and analytical solutions that enable the collection, processing, and analysis of financial and marketing data within a unified information space

Digital accounting tools integrated with marketing activities.	Examples of digital accounting tools integrated with marketing activities	Functions of digital accounting tools integrated with marketing activities
ERP systems (Enterprise Resource Planning)*	SAP, Oracle NetSuite, Microsoft Dynamics 365 (a hybrid platform that combines ERP and CRM functionality), SAP Business Technology Platform	Accounting for finances, managing inventory, sales, and procurement; generating real-time analytical reports.
CRM systems (Customer Relationship Management)**	Salesforce, HubSpot, Zoho CRM, Nimble, Pipedrive,Freshsales (Freshworks CRM), Microsoft Dynamics 365 (a hybrid platform that combines ERP and CRM functionality), Monday.com CRM.	Tracking customer behavior, audience segmentation, managing marketing campaigns.
BI platforms (Business Intelligence)***	Power BI, Sisense, Tableau, Domo, Qlik Sense, Zoho Analytics, MicroStrategy, IBM Cognos Analytics.	Data visualization, analysis of marketing effectiveness, forecasting financial results.
Marketing automation systems****	Marketo, Mailchimp, Adobe Marketing Cloud, HubSpot Marketing Hub, Active Campaign, Sendinblue, SharpSpring.	Automation of email campaigns, content management, analysis of customer interactions with marketing activities.
Analytical modules with artificial intelligence and forecasting*****	SAP Analytics Cloud, Salesforce Einstein Analytics, Google Cloud AI & BigQuery ML	Demand forecasting, evaluating the potential impact of marketing campaigns, recommendations for optimal budget allocation.

Note:
* Integrated platforms for managing company resources.
** Tools for managing customer interactions.
*** Analytical tools for processing large datasets and forecasting.
**** Software platforms that enable companies to automate repetitive marketing processes, coordinate customer interactions, and manage campaigns efficiently.
***** Software solutions or functional modules within larger platforms.
Source: compiled based on [2; 4—3; 6].

resource planning, and precise adjustment of marketing strategies according to the company's financial capabilities [6]. At the same time, the integration of accounting and marketing enhances the business's adaptability to changes in market conditions and rising consumer expectations.

Competitive pressure in the market forces companies to respond quickly to customer needs and optimize costs, which is impossible without digital integration. Modern digital platforms, such as ERP systems, CRM systems (Salesforce, HubSpot), and analytical BI platforms (Power BI, Tableau), enable the consolidation of accounting, marketing, and operational data into a single information space, ensuring timely analytics and process transparency [5—6]. For example, Ukrainian companies like "Coffee & Toast," "Black Cup," and "Кавоманія" have integrated the Salesforce CRM system with internal financial and operational data through analytical platforms to track the effectiveness of marketing campaigns in real time, adjust promotional spending based on store profitability, and forecast demand for new products. This integration allows for prompt adjustments to marketing campaigns according to the company's financial capabilities, efficient resource allocation, demand forecasting, and the adaptation of offers to changing consumer needs. In a highly competitive environment, such integration becomes a key factor in ensuring business resilience and competitiveness.

The transformation of accounting's role (driven by digital platforms and analytical systems) is manifested in the shift from traditional data processing and bookkeeping in a company's finance departments-where accounting focused primarily on recording financial transactions and preparing reports-to an active tool for strategic management at the leadership and cross-departmental level, where accounting becomes a foundation for both operational and strategic decision-making.

For example, in the past, accounting at Foundation Coffee Roasters may have been limited to maintaining transaction logs and producing monthly financial reports. However, with the implementation of SAP, management can now collect real-time data from finance, sales, procurement, and marketing, consolidate it into a unified system, and automatically generate analytical insights. Simultaneously, Power BI (an analytical BI platform) enables the visualization and on-demand analysis of large volumes of accounting data, allowing the marketing department to see which campaigns generate the highest profit and identify opportunities to significantly increase profitability in real-time [2].

Thus, the transformation of accounting's role involves moving from static reporting to an integrated, predictive, and analytical function that closely interacts with marketing and other departments.

CONCLUSIONS

The conducted study made it possible to establish that the development of digital technologies significantly changes the logic of information interaction between accounting and marketing systems. Interaction logic increasingly relies on the use of a data organization system, where all participants in business processes have access to integrated, consistent, and up-to-date information (a single information space), enabling management decisions to be made in real time.

It has been determined that the key areas in which digital technologies change the logic of information interaction between accounting and marketing systems are as follows: automation of accounting processes, which creates a single information space enabling marketers to quickly assess campaign effectiveness and adjust strategies; integration of accounting and marketing data, which forms a single information space where accounting and marketing become interconnected; enhancement of data usefulness through analytics and forecasting, which establishes a single information space where accounting and marketing data allow for well-founded managerial decisions; and flexibility in managing processes for meeting and shaping consumer needs, which creates a single information space where marketing teams can adapt their projects to current financial and operational indicators in real time.

It should be noted that the above-mentioned changes in the logic of information interaction between accounting and marketing occur through the systemic overlay of four processes: development of digital platforms and technologies; growth in data volume and processing speed; competitive pressure in the market; transformation of the accounting role. These processes shape a new quality of information interaction, in which accounting and marketing function as a single system rather than as isolated functions.

According to the studies cited, promising directions for further research include examining the risks of digital integration of accounting and marketing systems, particularly information security, protection of trade secrets, and data confidentiality.

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