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DIGITALIZATION'S IMPACT ON INDUSTRIAL MANAGEMENT AND MARKETING: ADDRESSING THE CHALLENGES OF OUR TIME

ДЕЯКІ АСПЕКТИ ВПЛИВУ ЦИФРОВІЗАЦІЇ НА ПРОМИСЛОВИЙ МЕНЕДЖМЕНТ ТА МАРКЕТИНГ: ВІДПОВІДЬ НА ВИКЛИКИ ЧАСУ

The article provides a specification of the main aspects of digitization's impact on industrial management and marketing. A distinctive feature of the research is that it convincingly demonstrates, based on logical analysis and synthesis methods, that the large-scale invasion of Russia into Ukraine did not halt the processes of digitization in industrial management and marketing. Using logical operations of comparison and abstraction, it has been proven that the processes of implementing digital technologies and tools for optimization and automation of management and marketing processes in industrial enterprises continue to evolve, albeit with a shift in their nature from security-oriented to reactive. This process entails the situational transformation of traditional work methods and the utilization of digital resources, which serves as a response to the challenges of the time, shaped by the ever-changing needs of industrial enterprises. The prospects for further research include the development of a model for the continuous adaptation of industrial management and marketing systems to changes. This model could be based on the integration of digital technologies, data, and analytics, enabling organizations to become more flexible and responsive to the challenges of the time.

Key words: management, marketing, network performance monitoring, marketing companies, strategic decision-making, customer needs.

Актуальність дослідження зумовлена тим, що з початком пандемії COVID-19 багато промислових підприємств активно почали впроваджувати цифрові технології у процеси управління та маркетингу. Основний акцент був зроблений на віддаленій роботі та комунікації. Зокрема, були введені в роботу системи, інструменти та платформи, що дозволили працювати віддалено і забезпечити ефективну комунікацію між співробітниками та клієнтами. Багато промислових компаній змінили свою стратегію просування товарів і послуг, що стало необхідністю в умовах обмежень, пов'язаних зі збереженням здоров'я співробітників і клієнтів, а також зміною способу споживання товарів і послуг. Однак, з початком військової агресії, ці процеси зазнали ще більших змін. Відтак, авторами дослідження були конкретизовані основні аспекти впливу цифровізації на промисловий менеджмент та маркетинг. Особливістю дослідження є те, що на основі методів логічного аналізу та синтезу було наочно доведено, що широкомасштабне вторгнення Росії в Україну не призвело до зупинки процесів цифровізації промислового менеджменту та маркетингу. За допомогою методів логічних операцій порівняння та абстрагування було доведено, що впровадження цифрових технологій та інструментів для оптимізації та автоматизації управлінських та маркетингових процесів у промислових підприємствах продовжується, хоча змінилося їхнє спрямування з безпекового на реактивний. Згідно з результатами дослідження, стає очевидним, що ситуативне

перетворення традиційних методів управління та маркетингу і використання цифрових ресурсів є відповіддю на виклики часу, сформовані загрозами кібербезпеки, змінами у потребах та пріоритетах споживачів, змінами в процесах використання даних для прийняття стратегічних рішень, обмеженнями можливостями для зустрічей з колегами та клієнтами та особистого контакту. Зміна характеру цифровізації промислового менеджменту та маркетингу з безпекового на реактивний відбувається шляхом внесення змін у їх технологічне середовище. Для подальших досліджень перспективним є розробка моделі постійної адаптації систем промислового менеджменту та маркетингу до змін. Ця модель має враховувати швидкі зміни у технологіях, у потребах ринку та у швидкості реагування на непередбачувані ситуації, що виникають в результаті змін у соціальному та економічному середовищі.

Ключові слова: менеджмент, маркетинг, моніторинг продуктивності мережі, маркетингові компанії, прийняття стратегічних рішень, потреби клієнтів.

Statement of the problem. With the onset of the COVID-19 pandemic, many companies and industrial enterprises started actively adopting digital technologies in their management and marketing processes. Specifically, the main focus was on remote work and communication. Indeed, the implementation of video conferencing systems, mass collaboration tools, and cloud platforms allowed for remote work and facilitated effective communication among employees and clients. Additionally, many industrial companies have shifted their strategy towards more active utilization of online platforms for selling goods and services, virtual stores, and advertising campaigns on social media. This became necessary due to the restrictions associated with ensuring the health and safety of employees and customers, as well as the changing consumer behavior. Furthermore, with the onset of military aggression, these processes have continued, but they have also become more diverse and complex in nature, as they are largely driven by the challenges of the time.

Analysis of recent research and publications. For a comprehensive understanding of the peculiarities of digitization in industrial management and marketing, it is advisable to refer to the works of domestic scholars who systematically study this issue. The works of the following scholars are widely recognized in the field: Maslyhan O., Bannikov V., Lobunets T., Buriak I., Shevchuk L., Voronkova V., Metelenko N., Olyfirenko Y., Povna S., and Bilanenko O. However, it is problematic that the majority of studies focus on examining the peculiarities of digitization within the defined scope during the COVID-19 pandemic. At the same time, the fundamental aspects of the impact of digitization on industrial management and marketing in the context of military aggression have been largely overlooked and remain practically unexplored.

Objectives of the article. According to the information provided, the purpose of the article is to specify the main aspects of the impact of digitization on industrial management and marketing.

Summary of the main research material. The analysis of recent studies confirms that the large-scale invasion of Russia into Ukraine since February 24, 2022, did not halt the digitization processes in industrial management and marketing. The implementation of digital technologies and tools for optimizing and automating management and marketing processes in industrial enterprises is currently continuing with a shift from security-oriented to reactive.

This process involves the situational transformation of traditional work methods, and the utilization of digital resources serves as a response to the challenges of the time, shaped by the ever-changing needs of industrial enterprises. Indeed, a reactive approach means that the enterprise responds to emerging problems or needs by taking situational measures to address them.

For example, if a new cybersecurity threat arises or there are issues with data security, the organization reacts by implementing additional security measures, enhancing control, and changing processes. Additionally, when new technologies or customer needs emerge, the organization responds by rapidly adopting digital solutions to meet those needs and leverage new opportunities.

Indeed, the reactivity of digitization processes is driven by the need to respond to challenges that arise during military aggression. These challenges include cybersecurity threats, shifts in consumer needs and priorities, changes in data utilization for strategic decision-making, and limitations on in-person meetings and personal contact [1; 3; 5]. While these challenges are not exhaustive, they allow us to identify the key aspects of the digitization impact in industrial management and marketing. Let's examine each of these aspects in more detail.

In the context of war, cybersecurity threats become particularly significant. To minimize this threat, industrial enterprises direct their digitization processes toward enhancing the protection of their digital management and marketing systems, data, and infrastructure from potential cyberattacks.

Based on recent research analysis [1–2; 5], such processes may include:

1. Implementation of modern security systems (which are a combination system formed through the installation of firewalls, intrusion detection systems (IDS), intrusion prevention systems (IPS), antivirus software, etc.) into digital management and marketing systems.

2. The data encryption systems use in management and marketing ensures an additional level of confidential information protection. It is achieved through:

- confidential information protection (includes encrypting management data such as financial reports, strategic plans, or personal customer data that may contain sensitive information);

- customer personal data protection (involves encrypting customer personal data, such as names, addresses, email addresses, and so on);

- electronic communication protection (includes encrypting data during the transmission of electronic messages, emails, or other forms of communication to ensure the confidentiality and integrity of the information).

3. The use of network monitoring in management and marketing is essential for:

- abnormal activity detection through cyber-attack detection (it allows for the identification of unusual or suspicious activity that may indicate potential cyberattacks);

- information leaks detecting (network monitoring helps identify possible leaks of confidential information by keeping track of network activities);

- internal threats identifying (it assists in identifying potential threats from within the organization, such as unauthorized access or misuse of resources);

- optimizing network processes (network monitoring enables the detection of bottlenecks, monitoring network performance, identifying unusual customer activity, and assessing the effectiveness of marketing campaigns, among other things).

4. Strengthening the cybersecurity culture among employees is achieved through:

- providing proper training and awareness on cybersecurity (involves organizing regular training programs, seminars, and workshops to disseminate information about potential cyber threats, defense methods, and incident response procedures);

- developing clear cybersecurity policies and procedures (these documents should be known and followed by all employees. They should include rules for password usage, safe practices for handling emails, and the use of company software and resources),

- promoting cybersecurity awareness among employees (this can be achieved by creating a security-conscious culture aimed at encourag-

ing employees to adhere to best cybersecurity practices. It involves recognizing their efforts and emphasizing the importance of security as an integral part of their job).

The specific effects of digitalization on the security of digital systems in industrial management and marketing are illustrated in Figure 1.

To implement the aforementioned measures, industrial enterprises actively engage cybersecurity experts. This is done to make changes to the technological environments of management and marketing based on the assessment of potential threats and to modify response strategies to possible cyber-attacks by altering their technological landscape.

In war conditions, there is a rapid change in consumer needs and priorities. Therefore, according to the available research [3; 4], it is evident that industrial enterprises utilize digitization to adapt to new conditions and to modify their marketing strategies by employing digital communication channels to attract and retain customers.

Thus, the impact of digitization processes may include [3; 4]:

1. Creation and maintenance of online presence, through websites, social media profiles, online stores, etc. This enables attracting consumer attention, showcasing products and services, and informing about promotions and special offers.

2. Utilizing social media to engage with customers, capture their attention, foster interaction, and obtain feedback. They publish interesting and valuable content, organize giveaways and contests, collaborate with influential personalities etc.

3. Implementing e-commerce to enable customers to make online purchases through convenient and secure platforms for ordering products and services, accepting payments, and facilitating delivery.

4. Collecting and analyzing customer data and creating personalized marketing campaigns (individually tailored offers and recommendations, as well as personalized communication) to increase the chances of attracting and retaining customers.

5. Creating a virtual experience for customers (virtual tours, product demonstrations, video presentations, and interactive applications) to provide customers with products or services remote imaging.

6. Using video clips to showcase products, provide usage instructions, and organize webinars for customer training and consultation.

Digitization provides industrial enterprises with a range of tools to adapt to changing consumer needs and priorities.

These tools enable the transformation of the technological environment of industrial marketing

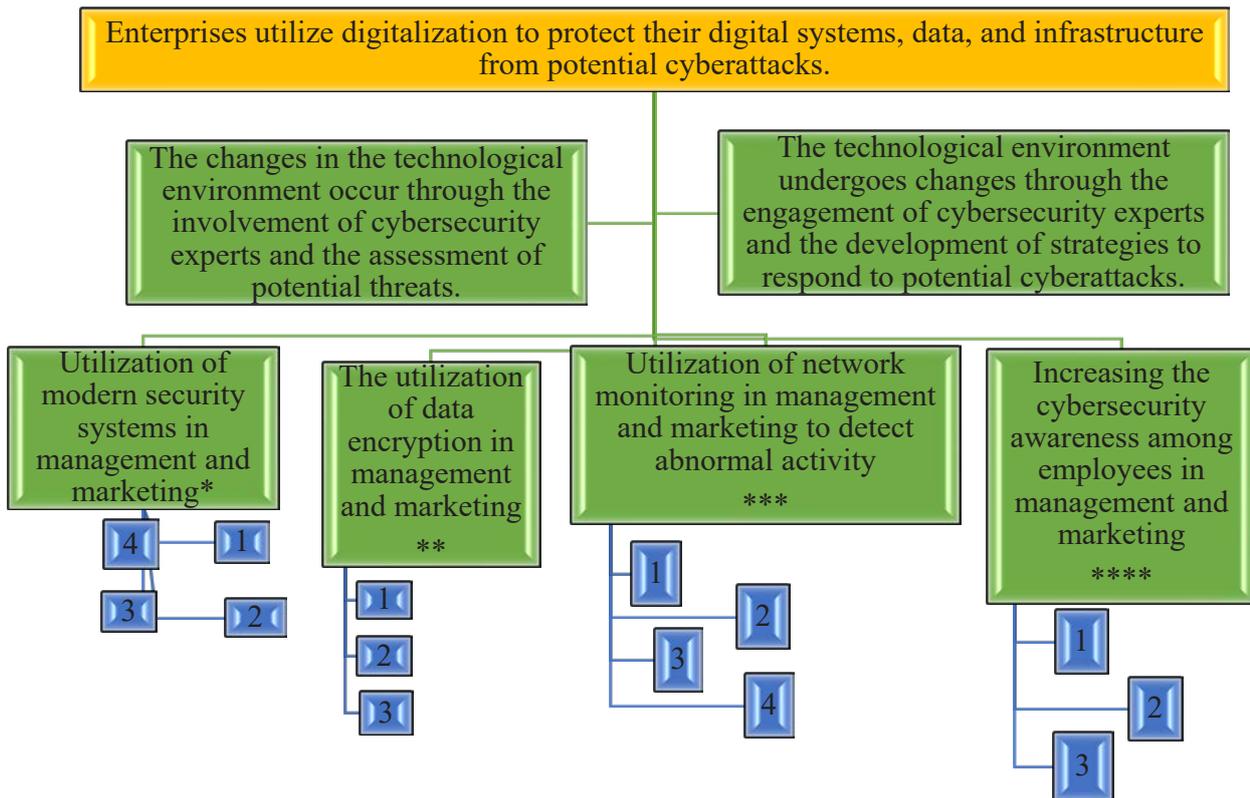


Figure 1. The effect of digitalization on safeguarding digital systems in industrial management and marketing

Note:

*(1) installation of firewalls to control incoming and outgoing traffic in computer networks; (2) intrusion detection systems installation (IDS) detects abnormal or suspicious activity in computer networks; (3) intrusion prevention systems implementation (IPS) responds to detected anomalous activity by blocking attacks or unwanted elements; (4) modern antivirus programs use.

** (1) confidential information protection; (2) customers' personal data protection; (3) electronic communication protection.

*** (1) cyber-attacks detection; (2) information leaks detection; (3) internal threats detection; (4) network processes optimization

**** (1) providing proper cybersecurity training and awareness among employees; (2) developing clear cybersecurity policies and procedures that should be known and followed by all employees; (3) promoting cybersecurity awareness among employees by fostering a culture of security.

Source: formed based on [1–2; 5]

in a way that supports constant interaction with customers, attracts new audiences, and retains existing customers. The specific impact of digitalization on the adaptation characteristics of industrial enterprises to new conditions and changes in marketing strategies is illustrated in Figure 2.

The digitization impact focused on expanding the capabilities of industrial enterprises to engage with consumers remotely, their demands and preferences include. It enables quick responsiveness to market changes influenced by shifts in consumer habits and demand for products and services.

In war conditions the change in data utilization processes for strategic decision-making is inevitable. When the situation rapidly evolves, digitalization (including the implementation of analytical tools and artificial intelligence for data collection, analysis, and utilization from various sources,

including social media, online resources, and other digital communication channels) is necessary to ensure the adaptability and flexibility of strategic decision-making processes. Thus, the visualization of the impact of digitization on the peculiarities of strategic decision-making in industrial management and marketing is presented in Figure 3.

Thus, the digitalization impact on the characteristics of strategic decision-making in industrial management and marketing is since the collected data (which can include customer feedback, consumption trends, demand for goods and services, competitive information, etc.) need to be analyzed using machine learning algorithms and artificial intelligence to identify useful patterns, forecast trends, and develop strategies. Furthermore, digitalization processes in industrial management and marketing shape changes in the technological

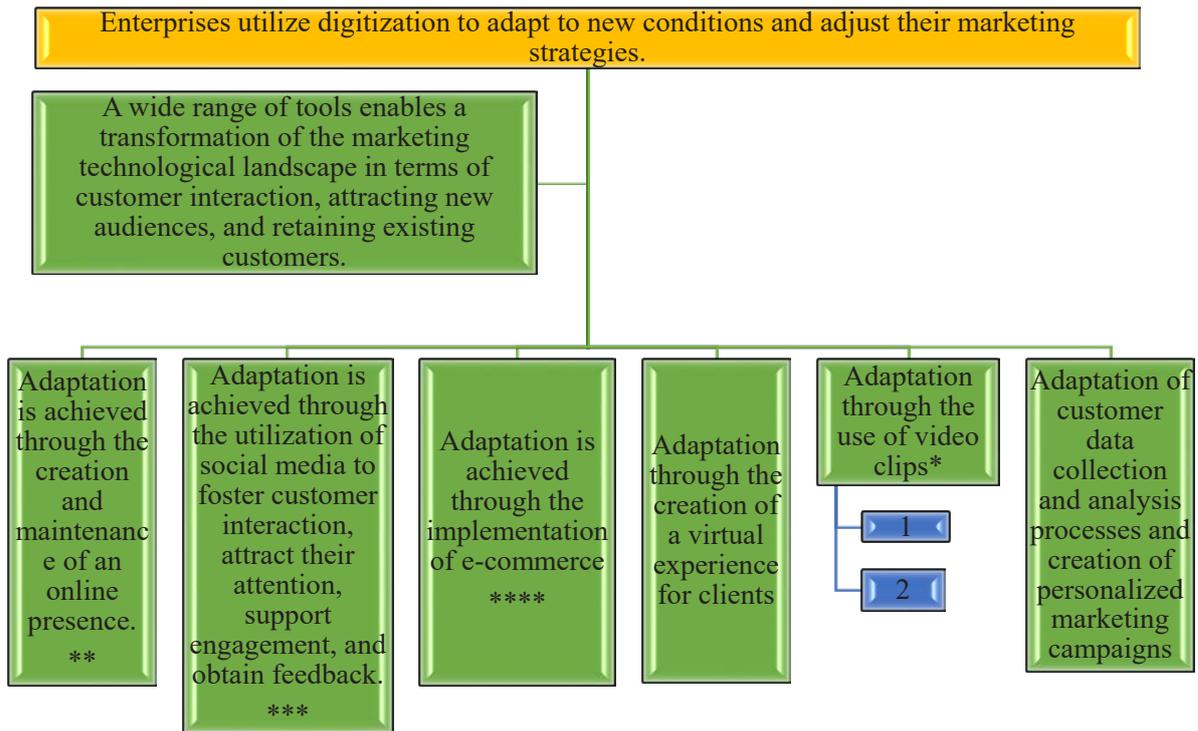


Figure 2. Digitization impact on the peculiarities of industrial enterprises' adaptation to new conditions and changes in marketing strategies

Note:

- * (1) use of video clips to demonstrate the product; (2) use of video clips to provide instructions on product usage.
- ** creation and maintenance of online presence for industrial enterprises through websites, social media profiles, online stores, etc.
- *** use of social media to interact with customers, attract their attention, facilitate interaction, and obtain feedback. Company experts publish interesting and useful content, organize giveaways and contests, collaborate with influential personalities, etc.
- **** industrial enterprises implement e-commerce to enable customers to make online purchases.

Source: formed based on [3]

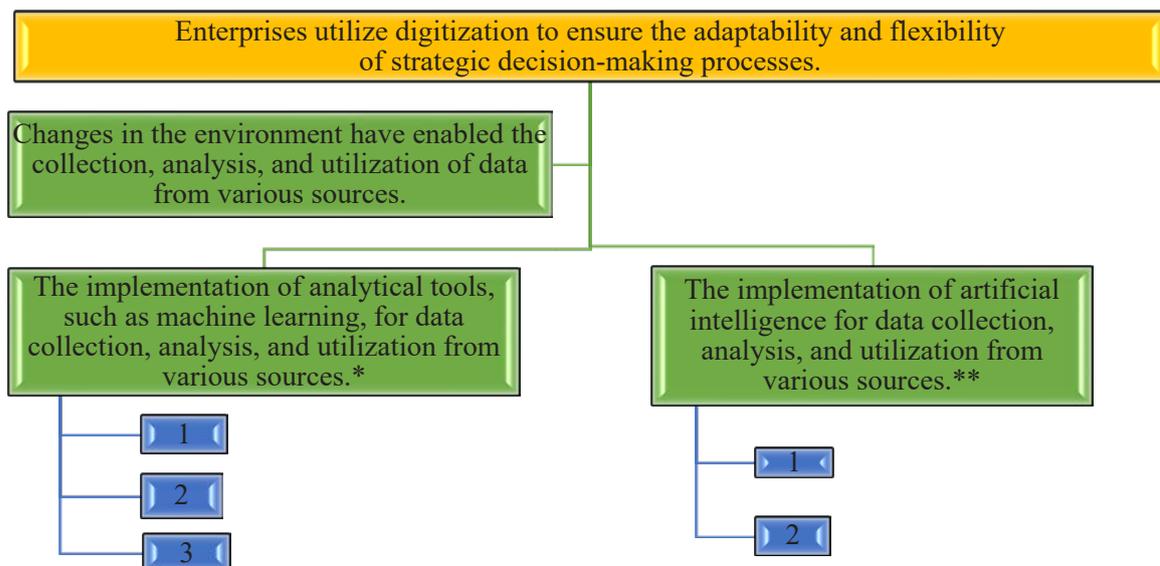


Figure 3. Digitalization impact on the characteristics of strategic decision-making in industrial management and marketing of the enterprise

Note:

- * (1) patterns identification; (2) trend forecasting; (3) flexible marketing and management strategies development.
- ** (1) flexible data analytics opportunities creation identifies new potential markets; (2) opportunities creation for determining optimal pricing strategies, improving logistics, and supply chain management.

Source: formed based on [1-2]

environment, creating opportunities to develop flexible data analytics for identifying new potential markets, determining optimal pricing strategies, and improving logistics, and supply chain management. It helps industrial enterprises adapt to market changes and respond to new consumer demands.

In the conditions of military aggression, there are limitations on the possibilities of meetings and personal contact. Therefore, industrial enterprises are implementing virtual and remote solutions such as [1–2; 5–6]:

1. Video conferences and online meetings (using web cameras, microphones, and specialized software, industrial enterprises can conduct conferences and virtual meetings with their employees, clients, and partners in real-time mode). This allows for communication, discussion of issues, presentations, and even remote training.

2. Virtual exhibitions, to maintain communication with employees, clients, and partners (takes place on specialized online platforms). It provides the opportunity to showcase products and services, conduct presentations, and interact with potential clients and partners in a virtual environment. It helps reduce costs for organizing and participating in exhibitions and allows for reaching a wide audience without geographical limitations.

The specifics of the digitalization impact on the adaptation features of industrial enterprises to new conditions and changes in marketing strategies are shown in Figure 4.

Therefore, digital technologies impact the format of business meetings and personal contact occurs through establishing communication with employees, clients, and partners without the need for physical presence in meetings.

It should be noted that there is a significant specificity in the impact of digitization on industrial management and marketing, as these processes essentially respond to the challenges of the time. The ultimate consequences of implementing digital technologies during military aggression can vary and technically depend on specific circumstances and company strategies. However, flexibility and readiness for change in industrial management and marketing are important to successfully adapt to new conditions and challenges.

Conclusions from the study. The research highlights that the large-scale invasion of Russia into Ukraine did not halt the digitization processes in industrial management and marketing. The study has demonstrated that:

1. The processes of implementing digital technologies and tools for optimization and automation of management and marketing processes have changed their nature from being security-oriented to reactive. This leads to the conclusion that there has been a transition to a reactive approach in the digitization of industrial management and marketing. Moreover, through the processes of digitization, industrial enterprises are adapting to emerging problems or needs by taking measures to address them.

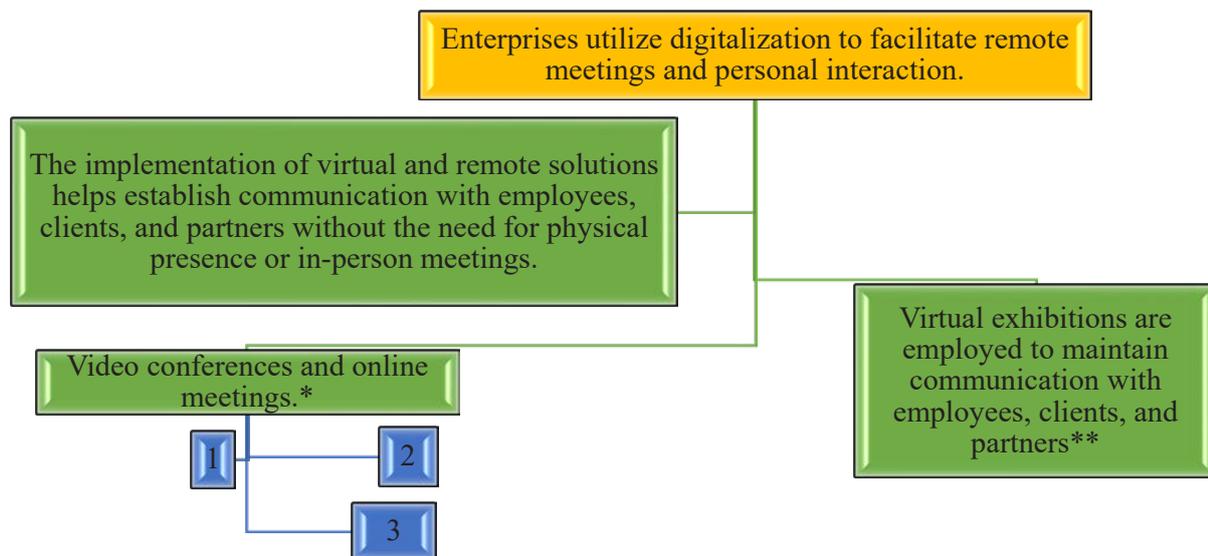


Figure 4. Digital technologies impact the format of business meetings and personal contacts in enterprises' industrial management and marketing systems

Note:

*The processes are carried out through the use of: (1) web cameras; (2) microphones; (3) specialized software.

** The processes are carried out through the use of specialized online platforms, where companies can create virtual stands, showcase their products, conduct presentations, and even organize video conferences for communication with employees, clients, and partners.

Source: formed based on [1–2; 5–6]

2. The situational transformation of traditional management and marketing methods and digital resources used are a response to the challenges of the time. This response leads to the conclusion that digital transformation is inherently unstable, requiring flexibility and rapid response to changing conditions and market demands. Digitizing industrial management is driven by the need to adjust efficiency and production processes in response to problems or needs, as well as demand changes, among other factors. Similarly, digitizing industrial marketing is driven by the need to adjust efficiency, address limitations in product promotion, attract new customers, and build interactions with them.

3. Digitalization in industrial management and marketing nature is undergoing a shift from secu-

rity-oriented to reactive, achieved through the technological environment changes of the systems facilitate their functioning. The fundamental aspects of digitalization in industrial management encompass active responses occurring in digital management systems, business process automation, and implementation of electronic monitoring and control systems uses. The fundamental aspects of industrial marketing digitalization encompass responses taking place in the utilization of digital communication channels, internet marketing, social media, data analytics, and other digital tools.

The prospects for further research include the development of a model for the continuous adaptation of industrial management and marketing systems to changes.

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