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MODERN PRINCIPLES AND MEANS OF AUTOMATION IN ACCOUNTING, MANAGEMENT, AND MARKETING

СУЧАСНІ ПРИНЦИПИ ТА ЗАСОБИ АВТОМАТИЗАЦІЇ ОБЛІКУ, МЕНЕДЖМЕНТУ ТА МАРКЕТИНГУ

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Automation of auxiliary business processes (specifically accounting, management, and marketing) has long ceased to be an experiment and has become necessary. This necessity is a direct result of the impact of using automated devices and technical means, as well as computing technology based on mathematical methods, on the speed of decision-making and task execution, labor cost levels, resource utilization efficiency, the number of errors, and the quality of products or services. The article outlines the modern principles and tools of automation in accounting, management, and marketing. The research highlights important aspects of business process automation and identifies some key points. Based on the results obtained, a deep analysis of the interaction between humans and machines in automated accounting, management, and marketing systems can be conducted

Keywords: phased automation, decision-making, development and implementation, marketing campaigns, accounting, unified approach, data unification.

Автоматизація допоміжних бізнес-процесів (облік, менеджмент, маркетинг) давно перетворилася на необхідність. Вона суттєво впливає на швидкість прийняття рішень, знижує витрати на персонал, підвищує ефективність використання ресурсів та покращує якість продукції/послуг завдяки використанню автоматичних систем і математичних методів. Мета статті полягає в окресленні сучасних принципів та засобів автоматизації обліку, менеджменту та маркетингу. Інтерпретуючи автоматизацію не як просте впровадження нового програмного забезпечення, а як комплексний процес, відмічена потреба додержання базових принципів, серед яких: стандартизація процесів обліку, менеджменту та маркетингу, модульність всіх процесів, гнучкість систем обліку, менеджменту та маркетингу та синтезованих у них процесів, інтегрованість систем обліку, менеджменту та маркетингу, безпека систем обліку, менеджменту та маркетингу, контроль та моніторинг роботи систем, орієнтація на користувача, поетапна автоматизація обліку, менеджменту та маркетингу. В цілому слід зазначити, що окреслені вище принципи не існують ізольовано. Комплексний підхід до автоматизації передбачає не просто впровадження окремих автоматизованих систем, а створення єдиного інформаційного середовища, де всі принципи автоматизації проявляють себе та взаємодіють між собою ефективно та безпечно. Щоб забезпечити окресле-



ну комплексність слід враховувати, що роль людини в бізнес-процесах має залишатись важливою за такими напрямками, як: прийняття рішень, контроль якості, розробка та впровадження. Доведено, що найскладнішим для розробки та впровадження є процес добору засобів автоматизації обліку, менеджменту та маркетингу. Це пов'язано з великою кількістю факторів, які необхідно врахувати, та високими ризиками неправильного вибору. Є доведеним той факт, що вибір засобів автоматизації складний через різноманіття пропозицій, індивідуальні потреби, технічні аспекти, фінансові обмеження та перспективи розвитку. На основі отриманих результатів можна провести глибокий аналіз взаємодії людини та машини в автоматизованих системах обліку, менеджменту та маркетингу.

Ключові слова: поетапна автоматизація, прийняття рішень, розробка та впровадження, маркетингові кампанії, облік, єдиний підхід, уніфікація даних.

Problem statement. The automation of auxiliary business processes (specifically accounting, management, and marketing) has long ceased to be an experiment and has become a necessity. This necessity is a direct result of the impact of using automated devices and technical means, as well as computing technology based on mathematical methods, on decision-making speed, task execution, labor cost levels, resource utilization efficiency, the number of errors, and the quality of products or services. Moreover, the advancement of technologies, which enable the automation of increasingly complex tasks such as data analysis, forecasting, and decision-making, has significantly influenced the relevance of automation. Additionally, customer expectations for personalized service and other factors have also played a crucial role. The automation of auxiliary business processes holds tremendous potential for enhancing companies' efficiency and competitiveness. However, not all companies successfully implement automated systems in practice due to reasons such as a lack of clear strategy, resistance to change, technical issues, organizational barriers, and insufficient attention to data. The content of these statements allows us to conclude that successful automation of accounting, management, and marketing requires a comprehensive approach that includes the fundamental principles and the tools for implementing the outlined process.

The analysis of recent researches and publications. An increasing number of studies are dedicated to examining the nuances of business process automation within enterprises. In recent years, significant attention to the issues of this topic has been associated with researchers, analysts, experts, and journalists such as Kulynych T., Biletska N., Halachenko O., Mashika Hanna, Zelic Victoria, Kiziun Alla, Maslyhan Roman, et al.

Despite significant attention to these issues, modern principles and tools for automating

auxiliary business processes such as accounting, management, and marketing have not been adequately covered in the scientific literature. Existing research often focuses on narrow aspects of automation, making it difficult to obtain a comprehensive overview.

Purpose of the article. The article outlines the modern principles and tools of automation in accounting, management, and marketing.

The paper main body with full reasoning of academic results. Automation of accounting, management, and marketing involves a set of measures aimed at replacing manual operations in these areas with automated ones through specialized software. Adhering to fundamental principles and making a thoughtful selection of automation tools allows for workflow optimization, increased efficiency, reduced error rates, and more informed decision-making.

Thus, interpreting automation not merely as the implementation of new software but as a comprehensive process that requires adherence to fundamental principles, including [2–3; 5]:

1. Standardization of accounting, management, and marketing processes. The principle is implemented through a unified approach and data unification. This unified approach entails that all auxiliary business processes are described clearly, to the extent that it allows for precise identification of which specific actions can be automated. Data unification involves ensuring that all data has a consistent format and is stored in a single repository to ensure its integrity and accessibility across different systems.

2. Modularity of all processes. This principle is implemented by breaking down large, complex processes in accounting, management, and marketing into subsystems. Specifically, large and complex processes should be divided into smaller, modular subsystems. This approach allows for the automation of each subsystem individually and makes it easier to make changes in the future.

3. Flexibility of accounting, management, and marketing systems, as well as the processes integrated within them. This principle is realized through adaptability to changes and scalability. Specifically, the automation system should be sufficiently flexible to adapt to changes in the business and easily scalable to meet the evolving needs of the organization.

4. Integration of accounting, management, and marketing systems. This principle is realized through a single interface and openness. Specifically, different automation systems for these areas should be integrated to ensure a continuous flow of data. The system should be open to integration with other systems already in use within the company.

5. Security of accounting, management, and marketing systems. This principle is realized through data protection and backup. The system must ensure reliable protection of data from unauthorized access. Regular data backups are essential for system recovery in the event of failures.

6. Control and monitoring of system performance. This principle is realized through performance analysis and error detection. Each system should provide the capability to track the effectiveness of automated processes and include built-in mechanisms for detecting and correcting errors.

7. User orientation. This principle is realized through an intuitive interface and user support. Specifically, each automated system should have a simple and intuitive interface and provide reliable user support.

8. Phased automation of accounting, management, and marketing. It is advisable

not to attempt to automate all processes simultaneously; instead, start with small projects and gradually expand the scope of automation.

Overall, it should be noted that the principles outlined above do not exist in isolation. They are closely interrelated and impact each other (see Figure 1).

For example, standardization and modularity (standardized processes are easier to break down into modules), flexibility and integration (a flexible system integrates easily with other systems), and security and control (monitoring the system helps ensure its security).

An comprehensive approach to automation involves not merely implementing individual automated systems but creating a unified information environment where all automation principles are effectively and securely manifested and interact. To ensure comprehensiveness vital to recognize that the role of specialists in business processes remains crucial in the following areas [1–2]:

1. Decision-making. Executives must make strategic decisions and oversee the overall direction of business development and individual management processes.

2. Quality control. Executives are responsible for overseeing the quality of data and the results produced by automated systems.

3. Development and implementation. Executives are responsible for designing, implementing, and maintaining automation systems.

It is worth noting that the most complex aspect of developing and implementing automation systems is the selection of tools for accounting, management, and marketing. This complexity

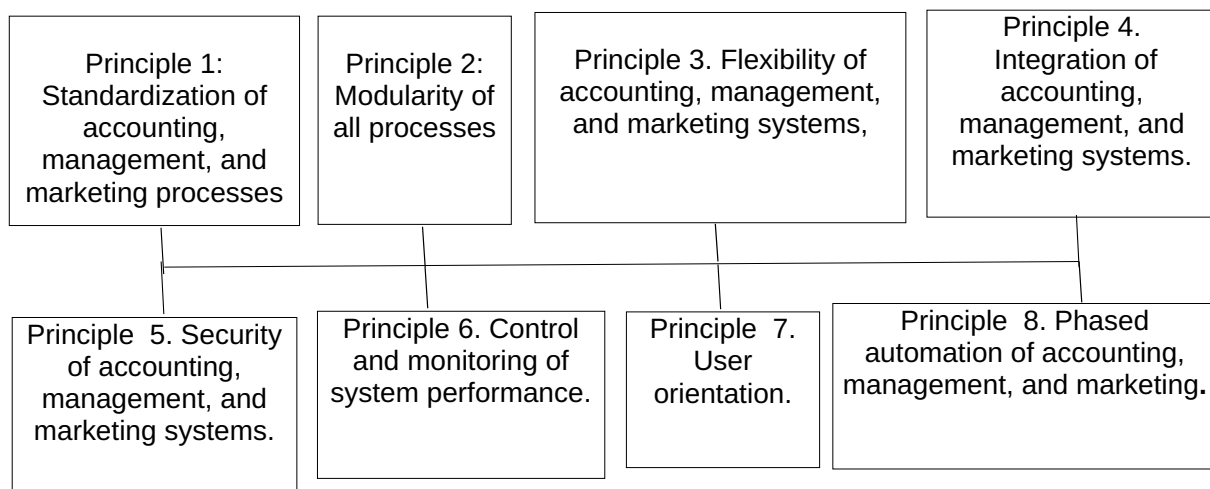


Figure 1. Interaction of principles in the automation of accounting, management, and marketing

Source: formulated by the author based on [2–3; 5]

arises from the numerous factors that need to be considered and the high risks associated with making an incorrect choice [3]. It is a well-established fact that the selection of automation tools is challenging due to [3; 5]:

1. Variety of offerings. The software market is saturated with a wide range of offerings (as evident from Table 2). Additionally, many modern automation systems are available as cloud-based solutions. All of this complicates the process of selecting the optimal solution.

2. Individual Needs. Each company has its unique auxiliary business processes and requirements for automation accounting, management, and marketing.

3. Technical Aspects. It is essential to consider the compatibility of the accounting, management, and marketing systems with existing hardware and software.

4. Financial Constraints. It is important to consider that the cost of automation systems can vary significantly, so selecting a solution that fits the company's budget is crucial.

5. Future Prospects. Accounting, management, and marketing systems should be flexible and scalable to accommodate the company's needs in the future.

Therefore, considering the variability in company size, business specifics, budget, and requirements for automation tools in accounting, management, and marketing, it is essential to evaluate these tools based on criteria such as functionality, intuitiveness, scalability, integration, cost, support, and security for effective selection [3–4]. The content and specifics of applying criteria for the effective selection of automation tools for accounting, management, and marketing are outlined in Table 2.

Table 1

List of offerings for automation of accounting, management, and marketing

Software	Functional features of the software	Application features and examples
ERP Systems (Enterprise Resource Planning)	These are comprehensive software solutions that integrate all the core functions of an enterprise, including accounting, production management, logistics, human resources management, finance, and more	These systems allow the automation of all business processes within a company in a unified information environment. Examples of ERP systems: SAP, Oracle, 1C, Microsoft Dynamics.
CRM Systems (Customer Relationship Management)	These systems are designed for customer relationship management (CRM).	These systems allow the storage of customer information, tracking of interaction history, automation of marketing campaigns, and improvement of customer service levels. Examples of CRM systems: Salesforce, HubSpot, Bitrix24.
BI- Systems (Business Intelligence)	BI systems allow for the collection, storage, processing, and visualization of data to support decision-making.	They help identify trends, forecast the future, and optimize business processes. Examples of BI systems: Tableau, Power BI, QlikView.
BPM-Systems (Business Process Management)	These systems enable modeling, analysis, and optimization of business processes.	These systems help identify bottlenecks, automate routine tasks, and increase work efficiency. Examples of BPM systems: Camunda, Appian, Bizagi.
Specialized Software	Specialized software products for automating specific tasks.	These systems help create, process, and store documents, plan, monitor, and evaluate projects, automate email marketing, social media marketing (SMM), and other marketing activities, and more.
Cloud Solutions	Many modern automation systems are offered as cloud-based solutions.	This allows companies to reduce costs associated with purchasing and maintaining equipment and also provides access to the system from anywhere with an internet connection.

Source: formulated by the author based on [3; 5]

Table 2

Content and specifics of applying criteria for the effective selection of automation tools for accounting, management, and marketing

Automation criteria	Characteristics of the criteria	Features of applying the criterion
Functionality	Full range of capabilities	The system should cover all necessary business processes of the company
	Customization	The ability to customize the system to meet specific needs.
	Modularity	The capability to expand functionality through additional modules.
Intuitiveness	Simple interface	The system should be easy to use, even for untrained users.
	Minimal clicks	Users should be able to quickly find the information they need.
	Accessible Documentation	Availability of detailed and understandable documentation.
Scalability	Business growth	The system should be ready to handle increased data volumes and user numbers.
	Flexible architecture	The ability to scale individual components of the system.
Integration	Compatibility	The system should easily integrate with existing company systems (ERP, CRM, accounting systems, etc.).
	API	Availability of open APIs for developing custom integrations.
	Connectors	Support for standard connectors to integrate with popular services.
Cost	Licensing	Various licensing models (perpetual licenses, subscriptions, cloud solutions).
	Additional costs	Implementation cost, staff training, and technical support.
	Cost-quality ratio	It is important to assess how well the system's functionality aligns with its cost.
Support	Technical support	Quality and speed of response to user queries.
	Documentation	Availability of detailed documentation and training materials.
	User community	Presence of an active community for support and knowledge exchange.
Security	Data protection	Existence of mechanisms for data protection against unauthorized access.
	Backup	Regular creation of data backups.
	Fault Tolerance	The system should be resilient to failures and equipment malfunctions.

Source: formulated by the author based on [2; 4–5]

When we talk about business process automation, we mean not just the implementation of individual software modules but the creation of a unified information environment that encompasses all aspects of the company's operations. Therefore, when selecting automation tools for accounting, management,

and marketing, the most important factor is that the system covers all the necessary business processes of the company. In particular, when all processes are integrated into a unified system, data is automatically transferred between different departments, eliminating the need for manual entry and reducing the risk of errors.

With complete and up-to-date information on all aspects of the business, management can make informed decisions quickly. Automation helps optimize company resources, such as time, money, and human resources.

Conclusions from this study and prospects for further exploration in this direction. The research confirms that business process automation is now a vital component of modern business. It has been demonstrated that automation optimizes workflows, enhances efficiency, reduces errors, and enables more informed decision-making. The following conclusions have been drawn:

1. Interpreting automation not merely as the implementation of new software but as a comprehensive process highlights the need to adhere to fundamental principles. These principles include: standardization of accounting, management, and marketing processes; modularity of all processes; flexibility of accounting, management, and marketing systems and their integrated processes; integration of accounting, management, and marketing systems; security of these systems; control and monitoring of system performance; user orientation; and phased automation of accounting, management, and marketing. Overall, it should be noted that the aforementioned principles do not exist in isolation.

2. A comprehensive approach to automation involves not just the implementation of individual automated systems, but the creation of a unified information environment where all automation principles are effectively and securely integrated and interact with each other. To ensure this level of complexity, it is important to recognize that the role of humans in business processes remains crucial in areas such as decision-making, quality control, and system development and implementation.

3. It has been proven that the most challenging aspects of development and implementation are the processes of selecting automation tools for accounting, management, and marketing. This complexity arises from the multitude of factors that need to be considered and the high risks associated with incorrect choices. The difficulty in selecting automation tools is well-established due to factors such as the variety of offerings, individual needs, technical aspects, financial constraints, and future development prospects.

The research sheds light on important aspects of business process automation and highlights several key points. Based on the results obtained, a thorough analysis of the interaction between humans and machines in automated accounting, management, and marketing systems can be conducted.

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