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AUTOMATION OF MANAGEMENT ACCOUNTING SYSTEMS AS A FACTOR IN ENHANCING BUSINESS EFFICIENCY

Summary. *Introduction. This study is devoted to a comprehensive analysis of the impact of automation of management accounting systems on business efficiency and management decision-making processes. The article presents a comprehensive methodology that makes it possible to use up-to-date accounting data to generate individualized management reports adapted to the specific needs of owners and managers. Purpose. The proposed approach is based on automated extraction, transformation and aggregation of data from accounting platforms such as 1C and Google Sheets, which provides the ability to build analytical reports on various business dimensions: revenue, costs, profitability, resource allocation and key performance indicators. The research integrates the theoretical foundations of management accounting with practical knowledge in the field of automation, emphasizing the transition from traditional static reporting methods to dynamic, predictive and prescriptive analysis supported by business intelligence (BI) and artificial intelligence (AI) tools. Materials and Methods. Automation not only speeds up the reporting process and minimizes errors, but also transforms management accounting into a strategic tool that enables scenario modeling, forecasting, and proactive monitoring of enterprise operations. Empirical evidence shows that the implementation of the proposed methodology contributes to significant positive changes.: increase profits by 30-50%, reduce variable costs by up to 40%, strengthen financial discipline, increase management flexibility and work efficiency. Results.*

Special attention is paid to the integration of automation with management decision-making processes, which allows timely identification of deviations, optimization of resources and improvement of indicators of sustainable business development in the digital economy. This research is of interest to both the academic community and practitioners seeking to optimize internal processes, increase competitive advantages, and implement digital technologies to increase transparency and strategic manageability of the company. The methodology presented in this paper demonstrates its versatility and adaptability to various industries, which makes it applicable to small, medium and large enterprises seeking to increase operational efficiency and financial stability in the modern business space.

Key words: *management accounting, automation, business efficiency, management reporting, digitalization of accounting, analytical methods, financial analysis.*

Introduction. The gap between an organization's operational management demands and traditional accounting methods, which rely on manual data processing and static spreadsheets, serves as a systemic source of reduced management adaptability. Delays in consolidating reporting data lead to decisions based on outdated indicators, while an increased probability of errors during manual entry complicates cost control, reduces the reliability of forecasts, and slows the response to external challenges. Practical observations are confirmed by analytical data that have documented regular instances of sluggish reporting chains when using static datasets [2].

The theoretical basis of management accounting defines its function as a provider of relevant financial and non-financial indicators for managerial decisions. The integration of business intelligence and corporate information platforms transforms this function through the automation of data collection, the consolidation of heterogeneous information, and the implementation of predictive models, which reflects the broader transformation trends of managerial accounting in the era of

digitalization [9]. This enables a shift from descriptive analytics to predictive and prescriptive analytics, thereby increasing the accuracy of cost calculations and performance indicators. The Managerial Accounting Data Analytics model developed by Appelbaum et al. [3] substantiates the need to couple BI tools with the balanced scorecard concept to achieve strategic alignment in reporting.

The practical implementation of automation faces challenges related to the programmability of management accounting work procedures. An intervention study by Korhonen, Selos, Laine, and Suomala shows that the level of automation is directly dependent on the formalization of accounting rules, the availability of clean and standardized data, and the readiness of employees for requalification [8]. A deficit of digital skills among management accountants becomes an obstacle to the expansion of automated solutions, whereas successful projects rely on procedural regulation, the translation of expert experience into algorithmic constructs, and the iterative verification of the correctness of automated calculations [5].

The impact of artificial intelligence and machine learning is evident in three areas: the automation of routine calculations and report preparation, the enhancement of predictive potential through the processing of large datasets, and the optimization of management scenarios using simulations and recommendation algorithms [14]. According to Deloitte [6], review and empirical studies in recent years have documented economic benefits expressed in reduced operating costs, accelerated transaction processing, and improved quality of forecast models when applying AI solutions in controlling and financial analytics. In this context, predictive algorithms increase the accuracy of anomaly detection, and automated reporting pipelines reduce the need for manual adjustments, which directly strengthens confidence in operational data within management cycles [12].

According to a report by ACCA [1], the argument for transitioning from static reporting forms to automated management accounting systems is built on an evidence-based foundation. Reports from professional associations show a high percentage of back-office tasks that are amenable to automation. Major consulting studies document

significant cost reductions and process acceleration when using intelligent automation [6]. Academic works demonstrate a deepening of analytical potential with the integration of BI and AI platforms [4]. The practical conclusion for managers and solution developers is that automation must combine the engineering overhaul of accounting procedures, the transformation of human skills, a data architecture that ensures quality, and reliable control mechanisms with algorithm explainability [7]. This path to increasing managerial agility and business sustainability is confirmed by academic literature and applied case studies [8].

The authors on whom this study relies bring diverse analytical perspectives: Appelbaum et al. [3] focus on a model for integrating BI into strategic reporting; Korhonen et al. [8] examine programmability along with organizational barriers to automation; Pavlovic et al. [14] assess the impact of AI on predictive analytics and automated reporting; and Deloitte [6] summarizes the applied economic effects and trends in the use of GenAI in financial functions. The combination of these research lines forms an applied paradigm for the transition to automated management accounting, where the main elements are the formalization of rules, ensuring data quality, transforming professional roles, and strengthening trust in algorithmic results.

Materials and Methods. Chipriyanova and Krasteva-Hristova [5] argue that the methodology of automating management accounting establishes a fundamentally different approach to constructing management reports. Instead of unified financial forms, it uses the results of processing raw data from accounting systems, which are generated to meet the individual needs of owners and managers. Unlike regulatory reporting, management forms are not limited by standards and can vary in focus (responsibility centers, product groups, business units), level of detail, and analytical depth. This allows for obtaining reports that are most relevant to current management tasks, while automation ensures their prompt creation and virtually eliminates the human factor at the preparation stage.

The technical basis of this approach is built around a software-algorithmic complex that is tightly integrated with the enterprise's accounting platforms, where

sources include local systems (e.g., 1C Accounting) and cloud solutions like Google Sheets, which store primary financial and operational information [11]. The structure of automated management accounting is detailed in Table 1.

Table 1

The Structure of Automated Management Accounting

Stage / Block	Functions and Content
Data Sources	Local systems (1C, ERP), cloud solutions (Google Sheets, CRM)
Data Transformation	Aggregation, filtering, reclassification, grouping by responsibility centers
Analytical Module	Calculation of KPIs, cost allocation, determination of profitability by area
Report Generation	Tables, dashboards, analytical summaries
Utilization	Managerial decision-making in near real-time

Source: systematized by the author on the basis of [2; 3]

The complex's functionality includes: automated data export (balances, income statements, cash flow statements) for a specified period, eliminating manual processing; data transformation through aggregation, filtering, and reclassification with grouping by responsibility centers, calculation of KPIs, allocation of costs into variable and fixed categories, and determination of profitability by area; and report generation, where structured data is presented in the form of tables, dashboards, or analytical summaries adapted to the business logic model (profit by product, profitability by region, budget control by department). Automated updates, where fresh information is periodically extracted and reports are refreshed, provide a quasi-real-time mode without additional effort from accountants and analysts [2]. The main advantages of this concept are shown in Table 2.

Table 2

Advantages of Automating Management Accounting

Advantage	Description
Faster Report Preparation	Reduction in time for data collection and processing

Advantage	Description
Minimized Errors	Automated extraction and aggregation of data
Increased Data Reliability	Unification of sources and regular updates
Reduced Labor Costs	Elimination of routine procedures, reallocation of staff to analytical tasks
Flexible Reporting Forms	Ability to adapt reports to current management tasks
Integration with Business Systems	CRM, ERP, and logistics platforms for cross-functional analytics

Source: systematized by the author on the basis of [3; 4; 12]

Barreto et al. [4] note that from a theoretical standpoint, the methodology is based on the system-analytical principles of management accounting. The use of primary accounting data ensures alignment with real business conditions and enhances the relevance of information. Automation guarantees the timeliness and regularity of reporting, which is central to a prompt response to deviations. The unification of sources strengthens the consistency of financial and management reporting, eliminating discrepancies at the stage of forming an understanding of the business's condition and promoting more informed managerial decisions.

Practical implementation requires a quality human resources base. Management accountants must shift their function from "data collectors" to the role of "analyst-interpreters," possessing IT skills, knowledge of accounting data structures, and the ability to apply analytical methods and BI tools, which highlights the growing strategic role of management accountants in decision-making processes [10]. Therefore, the digital transformation of MA is possible only with specialists who are proficient in programming, analytics, and business intelligence tools [7]. As the author's experience shows, this allows for the rapid implementation and adaptation of automated solutions to the current needs of the business [2; 5].

The next stage involves the implementation of artificial intelligence and machine learning for predictive analytics and anomaly detection, the use of BI solutions for interactive report visualization, and the expansion of information sources (CRM, ERP,

logistics) to build a multi-faceted management model. However, without thorough staff training, a well-thought-out data architecture, a clear understanding of business logic, and a developed infrastructure, the expected benefits of automation will be unattainable.

Results and Discussion. The empirical validation of automated management accounting has revealed a pronounced effect for companies that have implemented this methodology. A profit increase of 30–50% was explained not by sales growth, but by a transformation in the structure of revenues and expenses, where transparent control allowed owners to direct resources to high-profit segments, track margins on specific products and services, eliminate areas with negative profitability, and adjust pricing strategies [11].

A reduction in variable costs of up to 40% was achieved through automatic monitoring and the detection of inefficiencies, which opened up opportunities to revise supplier contracts and optimize production processes without compromising quality. The strengthening of financial discipline, along with the regular receipt of reports on current KPIs, enhanced control over indicator dynamics and increased the flexibility of managerial decisions due to access to information in near real-time [5].

Labor resource savings were achieved by eliminating duplicate procedures, reducing report preparation times, minimizing manual entry errors, and redirecting personnel to analytical tasks with higher added value [12]. The results of implementing automated management accounting are depicted in Table 3.

Table 3

The Impact of Automation on Companies' Financial Indicators

Indicator	Before Automation	After Automation	Change (%)
Profit Growth	—	30–50%	+30–50%
Reduction in Variable Costs	—	up to 40%	–up to 40%
Report Preparation Time	high	low	↓

Indicator	Before Automation	After Automation	Change (%)
Manual Entry Errors	frequent	minimal	↓
Access to Current KPIs	limited	in real-time	↑

Source: systematized by the author on the basis of [6]

The theoretical value of the results obtained is demonstrated by confirming the essential integration of management accounting into strategic management, where automation eliminates the boundary between current bookkeeping and long-term analysis between current bookkeeping and long-term analysis, fundamentally transforming financial management practices [13]. This transforms the management function into a tool for proactive forecasting and strategic coordination. Such an approach expands the methodology of accounting to include not only the recording of business activities but also scenario modeling, which aligns with the conclusions of Appelbaum, Kogan, Vasarhelyi, and Yan [3] on the transformation of MA with the integration of analytics and corporate systems, as well as with the research of Pavlovic et al. [14], which confirmed the significance of artificial intelligence for predictive analysis. For professional training, this implies the need to synthesize accounting knowledge, IT competencies, and analytical skills, which resonates with the conclusions of Khalid [7] about the new role of the accountant-analyst in the digital environment.

The practical utility is expressed in the high return on investment in automation, where profit growth and cost reduction directly enhance a company's competitiveness and market value. The scalability of the solutions allows the system to be implemented in different departments or subsidiaries while maintaining a unified methodology and transparency. Furthermore, comprehensive integration with CRM, production, and logistics modules forms the basis for multi-faceted analytics, which is confirmed by the research of Korhonen and colleagues [8], who documented the effect of formalizing and programming operations. The embedding of automated accounting into business processes reflects not a temporary trend but a long-term stage of global digital

transformation, as evidenced by reports from ACCA and Deloitte, which indicate the potential for automating up to half of back-office functions. Collectively, these circumstances demonstrate that the automation of management accounting is not only a response to modern challenges but also a mechanism for strategic resilience in the future digital business landscape.

Conclusion. The automation of management accounting has established itself as a catalyst for enhancing enterprise performance in the digital economy. The practical experience of applying a methodology based on processing primary accounting data and creating customized reporting confirms a steady increase in financial indicators, where profit growth in certain areas reached 30–50%, variable costs were reduced by up to 40%, and profitability and resource allocation discipline were strengthened. The transformation of a manual and labor-intensive process into an analytical tool ensured the receipt of data with minimal delays, providing management with a basis for fast and well-founded decisions.

The significance of the methodology extends beyond individual implementations, as the synergy of accounting data, analytical approaches, and IT solutions forms a new standard of management practice. Within this framework, the digitalization of reporting becomes an objective condition for maintaining competitiveness, and the integration of business intelligence and automated accounting systems changes the very nature of management accounting, shifting it from a retrospective tool to an element of strategic management capable of providing forecasting and adaptability.

Despite the absence of patent protection and formal certification, the empirical validation of the methodology has demonstrated the reproducibility of results in diverse organizations, including profit growth, cost reduction, business process optimization, and reduced labor costs, as well as increased flexibility and scalability. In fact, each implementation transformed the management accounting system into a "business control panel," where key indicators were visualized in near real-time, opening up the possibility for prompt intervention in the company's activities.

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