



ANALYTICAL AND SYNTHETIC ACCOUNTING OF PAYROLL IN BUDGETARY ORGANIZATIONS

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Abstract

This article examines analytical and synthetic accounting of payroll in budgetary organizations, focusing on how the two accounting layers jointly ensure completeness, traceability, and control of labor-cost recognition. Payroll is treated as a high-materiality expenditure item that affects budget execution, financial reporting credibility, and compliance with labor and public-finance rules. The study clarifies the functional division between synthetic accounting, which aggregates payroll-related liabilities and expenses by general ledger accounts, and analytical accounting, which disaggregates payroll data by employees, accrual types, funding sources, cost centers, and periods. The article emphasizes that effective payroll accounting in budgetary entities must reconcile three logics at once: the economic substance of compensation, the legal framework of employment relations, and the constraints of budget classifications and appropriations. Attention is paid to typical process stages, including timekeeping, payroll calculation, tax and social contribution withholding, payment execution, and subsequent reconciliation. The research outlines key control points that reduce risks of over-accruals, duplicate payments, incorrect classifications, and weak documentation, with special emphasis on segregation of duties, automated validation rules, and periodic matching between analytical registers and general ledger balances. The paper also highlights the role of standardized primary documents, internal regulations, and integrated information systems in improving data quality and shortening closing cycles. The findings argue that payroll accounting quality is less dependent on the mere presence of software and more on consistent chart-of-



accounts mapping, well-designed analytical dimensions, and disciplined month-end procedures. The article contributes a structured view of payroll accounting architecture in budgetary organizations, offering practical guidance for universities and other public-sector entities seeking to strengthen expenditure transparency, budget discipline, and audit readiness.

Keywords. Payroll accounting, analytical accounting, synthetic accounting, budgetary organizations, public sector accounting, general ledger, payroll accruals, compensation expenses, wage liabilities, deductions and withholdings, internal control, budget classification, cost centers, funding sources, reconciliation, audit trail, financial reporting, compliance, month-end closing, information systems.

“BYUDJET TASHKILOTLARIDA MEHNATGA HAQ TO‘LASHNING ANALITIK VA SINTETIK HISOBI”

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Annotatsiya

Mazkur maqolada byudjet tashkilotlarida mehnatga haq to‘lashning analitik va sintetik hisobi ko‘rib chiqilib, ushbu ikki hisob darajasi mehnat xarajatlarini to‘liq aks ettirish, izchillikni ta‘minlash va nazoratni kuchaytirishda qanday o‘zaro uyg‘unlashishi tahlil qilinadi. Ish haqi byudjet ijrosi, moliyaviy hisobotlarning ishonchliligi hamda mehnat va davlat moliyasi normalariga rioya etilishiga bevosita ta‘sir ko‘rsatuvchi yuqori ahamiyatga ega xarajat turi sifatida talqin etiladi. Tadqiqotda sintetik hisobning ish haqi bo‘yicha majburiyatlar va xarajatlarni bosh kitob schyotlari kesimida umumlashtirishdagi o‘rni hamda analitik hisobning ma‘lumotlarni xodimlar, hisoblash turlari, moliyalashtirish manbalari, xarajat markazlari va davrlar bo‘yicha batafsil ochib berishdagi funksiyasi aniqlashtiriladi. Maqolada byudjet tashkilotlarida samarali ish haqi hisobi iqtisodiy mazmun, mehnat-huquqiy munosabatlar va byudjet tasnifi



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hamda smeta cheklovlari talablarini bir vaqtning o'zida muvofiqlashtirishi zarurligi asoslab beriladi. Vaqt hisobini yuritish, ish haqi hisoblash, soliqlar va ijtimoiy ajratmalarni ushlab qolish, to'lovni amalga oshirish hamda keyingi solishtirish jarayonlarining asosiy bosqichlari yoritiladi. Ortiqcha hisoblash, takroriy to'lovlar, noto'g'ri tasniflash va hujjatlashtirishdagi kamchiliklar xavfini kamaytirishga xizmat qiluvchi muhim nazorat nuqtalari, jumladan vakolatlarni ajratish, avtomatlashtirilgan tekshiruv qoidalari va analitik registrlar bilan bosh kitob qoldiqlarini davriy taqqoslash mexanizmlari tahlil etiladi. Shuningdek, birxillashtirilgan birlamchi hujjatlar, ichki me'yoriy hujjatlar va integratsiyalashgan axborot tizimlarining ma'lumotlar sifati va hisobotni yopish muddatlarini qisqartirishdagi roli ko'rsatib beriladi. Tadqiqot natijalari ish haqi hisobi sifati faqat dasturiy ta'minot mavjudligiga emas, balki schyotlar rejasi bo'yicha izchil moslashtirish, puxta ishlab chiqilgan analitik o'lchamlar va intizomli oy yakuni tartib-taomillariga ko'proq bog'liqligini asoslaydi. Maqola byudjet tashkilotlarida ish haqi hisobi arxitekturasiga tizimli yondashuvni taklif etib, universitetlar va boshqa davlat sektori subyektlari uchun xarajatlar shaffofligi, byudjet intizomi va auditga tayyorgarlikni mustahkamlash bo'yicha amaliy tavsiyalar beradi.

Kalit so'zlar. ish haqi hisobi, analitik hisob, sintetik hisob, byudjet tashkilotlari, davlat sektori hisobi, bosh kitob, ish haqi hisob-kitoblari, mehnat xarajatlari, ish haqi majburiyatlari, ushlab qolishlar, ichki nazorat, byudjet tasnifi, xarajat markazlari, moliyalashtirish manbalari, solishtirish, audit izi, moliyaviy hisobot, muvofiqlik, oy yakuni yopilishi, axborot tizimlari.

Introduction

Payroll in budgetary organizations is not only a routine accounting object but also a core mechanism through which public institutions translate staffing policies into budget execution, service delivery, and measurable socioeconomic outcomes. For a transport university, payroll costs typically form one of the largest and most sensitive expense blocks because they include remuneration of academic staff, administrative personnel, technical employees, and auxiliary units, while also reflecting workload allocation, incentive schemes, and legal



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guarantees. Any distortion in payroll accounting affects both managerial decisions and external accountability: overstated accruals weaken budget discipline, understated liabilities create payment arrears, misclassified expenses distort cost estimates by programs, and inadequate documentation raises audit risk. Therefore, the accounting architecture of payroll must ensure simultaneously accuracy of calculation, legality of payments, correct budgetary classification, and reliable presentation in financial statements.

In professional accounting discourse, the integrity of payroll recognition is determined by the coherence between synthetic and analytical accounting. Synthetic accounting provides generalized information through the system of general ledger accounts, enabling the entity to present aggregated payroll expenses, payable obligations to employees, and related settlements with the state and social funds. Analytical accounting, in contrast, provides detail that makes the synthetic figures verifiable and controllable, because it tracks accruals and deductions by each employee and by relevant attributes such as position, department, funding source, and type of payment. In the public sector, this dual structure becomes particularly critical: payroll must be aligned not only with internal policies and labor contracts but also with budget appropriations, spending limits, and classification codes that determine whether an expense is authorized and how it is reported to supervisory bodies.

The relevance of the topic is also strengthened by the ongoing digitalization of public finance management. Many budgetary organizations adopt payroll and accounting software, yet errors remain common due to imperfect configuration of analytical dimensions, weak integration between HR and accounting modules, inconsistent reference data, and insufficient reconciliation routines. Automation can accelerate calculation and reporting, but it can also scale up mistakes if master data are incorrect or if the mapping between analytical registers and synthetic accounts is not rigorously controlled. For universities, additional complexity arises from mixed remuneration models, such as base salary with teaching load adjustments, bonuses linked to performance indicators, overtime, substitution payments, stipends and grants administered through separate rules, and payments funded from different sources. These features increase the need for a clear analytical structure and stable synthetic aggregation



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to ensure that each payment is legally justified, correctly classified, and transparently traceable.

From a governance perspective, payroll accounting functions as a control environment element. It is a domain where fraud and error risks are structurally higher because payments are frequent, involve many recipients, and depend on multiple input documents. Typical risk scenarios include fictitious employees, manipulation of time records, unauthorized bonuses, double payments, incorrect application of tax rates, and misallocation of costs to programs or funding sources. Such risks cannot be mitigated solely by post-factum audits; they require preventive controls embedded into accounting procedures. The design of analytical registers, approval workflows, and reconciliation protocols is therefore a practical and methodological question with direct consequences for compliance and efficiency.

The purpose of this study is to examine the logic and organization of analytical and synthetic payroll accounting in budgetary organizations and to identify how their coordination improves transparency, reduces errors, and supports internal control and audit readiness. To achieve this purpose, the article addresses several tasks: to conceptualize payroll as an accounting object in the budgetary sector; to clarify the roles and boundaries of synthetic and analytical accounting; to describe the documentation and processing stages that generate accounting entries; to define reconciliation mechanisms between registers and the general ledger; and to formulate practical recommendations relevant to a transport university's economic and administrative environment.

The novelty of the research lies in presenting payroll accounting not as an isolated set of postings but as an integrated architecture that connects HR data, timekeeping, budget classification, and financial reporting into a coherent control loop. This approach emphasizes that the quality of synthetic payroll balances depends on the analytical design choices made at the level of employee-level records and payment-type codification. Consequently, the study positions analytical and synthetic accounting as complementary instruments: synthetic accounting ensures reporting completeness, while analytical accounting ensures verifiability, managerial usefulness, and compliance traceability.



In terms of practical significance, the results can be used to improve payroll accounting policies in public universities and other budgetary entities, enhance month-end closing procedures, and strengthen internal controls over wage payments and related deductions. The study is also relevant for audit and inspection practice, because it identifies key points where reconciliation and documentation provide strong evidence of legality and correctness of payroll expenses.

Methods

The methodological framework of this study is grounded in public sector accounting theory, financial control principles, and applied analysis of payroll accounting procedures within budgetary organizations. The research adopts a systems approach, treating payroll accounting as an integrated subsystem of financial management that connects human resource administration, budget execution, and general ledger reporting. This perspective allows analytical and synthetic accounting to be examined not as isolated techniques but as interdependent components of a unified information architecture.

The study employs normative analysis to examine the regulatory environment governing payroll recognition, accrual, and payment in budgetary entities. Legislative acts, labor law provisions, public finance regulations, and methodological guidelines for budget accounting are reviewed to identify the mandatory requirements that shape payroll accounting structures. This step ensures that the discussion of analytical and synthetic accounting reflects compliance obligations regarding documentation, classification of expenditures, withholding of taxes and social contributions, and reporting standards.

A functional decomposition method is used to break down the payroll process into sequential stages: collection of primary data, calculation of gross wages, determination of deductions, accrual of employer contributions, recording in accounting registers, payment execution, and reconciliation. Each stage is analyzed to determine which information belongs to analytical registers and which is reflected in synthetic accounts. This decomposition clarifies the logic of data flow from individual employee records to aggregated ledger balances and financial statements.



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The research further applies comparative analysis to evaluate alternative configurations of analytical accounting dimensions. Particular attention is paid to the selection of analytical attributes such as employee identification, structural subdivision, position category, funding source, cost center, program code, and type of remuneration. The study assesses how the choice and structure of these dimensions influence the accuracy of cost allocation and the transparency of reporting. By comparing simplified and multidimensional analytical structures, the research identifies the configurations that best support internal control and managerial decision-making in a transport university context.

Document analysis is also applied to primary payroll documentation, including timesheets, employment contracts, payroll sheets, accrual registers, payment orders, and reconciliation statements. The methodological aim is to determine whether the documentation structure provides a clear audit trail between analytical records and synthetic postings. The existence of consistent coding systems, cross-references, and authorization signatures is evaluated as a condition for reliable accounting.

In addition, the study uses internal control modeling to identify key control points within the payroll accounting cycle. Segregation of duties, automated validation checks, supervisory review procedures, and month-end reconciliations are mapped to specific risks such as duplicate payments, incorrect accruals, or misclassification of expenses. This modeling approach demonstrates how analytical detail supports preventive controls, while synthetic summaries support detective controls through variance analysis and balance verification.

A reconciliation-based analytical technique is employed to examine the correspondence between analytical registers and general ledger balances. The method involves comparing totals of payroll accruals and deductions at the employee level with aggregated figures reflected in synthetic accounts. Discrepancies are categorized according to origin, such as data entry errors, timing differences, or incorrect account mapping. This approach highlights the methodological importance of regular reconciliation as a mechanism ensuring integrity of financial information.



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The study also integrates elements of information systems analysis. Given the increasing digitalization of payroll processes, the configuration of accounting software is examined as part of the methodological framework. Particular emphasis is placed on master data management, account mapping rules, and automated posting algorithms. The research evaluates how system design influences the interaction between analytical and synthetic accounting and how improper configuration may distort reporting results.

Empirical insights are derived from generalized observations of payroll accounting practices in higher education institutions operating under budgetary financing. Although the study does not rely on confidential institutional data, it synthesizes typical operational scenarios and accounting entries to illustrate methodological conclusions. This approach ensures practical relevance while maintaining analytical generality.

Overall, the chosen methods combine regulatory review, process analysis, comparative evaluation, document examination, reconciliation testing, and control modeling. Such a comprehensive methodology provides a structured basis for assessing the coherence between analytical and synthetic payroll accounting and for formulating evidence-based recommendations aimed at improving reliability, transparency, and efficiency of payroll accounting in budgetary organizations.

Results

The study's results demonstrate that the reliability of payroll accounting in budgetary organizations depends primarily on the consistency of the analytical register architecture with synthetic general ledger aggregation, and on the discipline of reconciliation procedures embedded into the monthly closing cycle. When these elements are aligned, payroll expenses become traceable from primary documents to financial statements, budget execution reports become internally consistent, and audit evidence becomes straightforward to assemble. When they are not aligned, even technically correct payroll calculations can yield distorted accounting outputs due to misclassification, incomplete postings, or weak control over liabilities and deductions.



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The first result concerns the functional boundary between synthetic and analytical accounting. Synthetic accounting is effective for presenting aggregated payroll and related settlements, but it is insufficient for ensuring control over legality and correctness of individual accruals. Analytical accounting, when properly structured, provides the necessary granularity to verify each component of payroll by employee and by remuneration type. The research confirms that budgetary entities achieve the strongest control environment when analytical registers are designed not merely as employee lists but as multidimensional records that support budget classification, cost allocation, and compliance monitoring. In practical terms, analytical accounting must explain every synthetic balance, and each synthetic total must be reproducible from the analytical data without manual adjustments.

The second result relates to the design of analytical dimensions. The study finds that the minimum set of analytical attributes required for a transport university's payroll accounting includes employee identifier, structural unit, position category, payment type, period, funding source, and cost center or program code. Adding these attributes significantly increases the ability to produce management and compliance reports without reprocessing data outside the accounting system. The research also shows that payment type codification is a critical driver of accounting quality: without standardized codes distinguishing base salary, bonuses, overtime, substitution payments, sick leave, vacation pay, and other compensations, analytical registers become ambiguous, which leads to incorrect mapping to synthetic accounts and budget classification items. Standardization of payment type codes improves both posting accuracy and comparability of payroll trends over time.

The third result concerns the mapping between analytical records and synthetic accounts. The research identifies that most reconciliation issues arise from incorrect posting algorithms in accounting software, especially when master data are incomplete or outdated. Typical cases include assigning the wrong expense account to a specific allowance, posting net pay instead of gross pay to expense accounts, or recording deductions inconsistently between employee liabilities and settlements with public authorities. The study shows that organizations reduce such errors when they implement formal account mapping



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matrices that link each payment type and funding source combination to a predefined synthetic account and budget classification code. This matrix becomes a control tool: any deviation signals either a data issue or an unauthorized payment type.

The fourth result concerns the structure of internal controls. The study confirms that payroll accounting risks are most effectively managed when controls are placed at three layers. The first layer is input control, focusing on timekeeping accuracy, HR authorization of staffing changes, and verification of workload allocation. The second layer is calculation control, focusing on correctness of accrual formulas, application of coefficients, and validation of deduction rates. The third layer is accounting control, focusing on correct classification, completeness of postings, and reconciliation between analytical totals and synthetic balances. The research finds that the third layer is often underestimated, although it is the layer that determines the integrity of financial reporting. Regular reconciliation at month-end reduces the persistence of errors and prevents cumulative distortions in liabilities, particularly in accounts reflecting payroll payable and settlements for taxes and social contributions.

The fifth result addresses documentation and audit trail strength. The research indicates that payroll systems with clear cross-referencing between timesheets, payroll calculation sheets, and posting registers provide a verifiable audit trail that shortens both internal review and external audit procedures. Where cross-referencing is weak, organizations rely on manual explanations that increase the probability of inconsistency and reduce confidence in the accounting system. The study identifies that the most robust documentation practice is the use of unified register identifiers, where each payroll run generates a unique reference number linked to all related documents and postings. This practice supports traceability and simplifies investigation of discrepancies.

The sixth result concerns budget execution and managerial reporting. The research shows that a properly configured analytical structure enables payroll expenses to be analyzed by departments, programs, and funding sources without additional spreadsheet-based manipulation. For a transport university, this is crucial because academic departments, research projects, and support services may be financed through different budget lines or special funds. The study finds



that when analytical accounting captures funding source and cost center at the transaction level, the institution can monitor spending limits in near real time, detect overruns early, and support evidence-based staffing decisions. Conversely, when these dimensions are missing, the university can only assess payroll at a highly aggregated level, which delays corrective action and weakens budget discipline.

The seventh result is a set of performance indicators that reflect payroll accounting maturity. The study proposes practical indicators such as the share of payroll transactions automatically posted with correct classification, the number of reconciliation discrepancies per month, the average time to close payroll accounts, and the frequency of retroactive corrections. Organizations with mature analytical-synthetic alignment show low discrepancy counts, stable closing timelines, and minimal retroactive adjustments. These indicators can be used for internal benchmarking and continuous improvement.

In summary, the results confirm that the central condition for reliable payroll accounting in budgetary organizations is the architectural coherence between analytical registers and synthetic general ledger accounts, supported by standardized codification, formal mapping rules, and disciplined reconciliation routines. For transport universities, where payroll structures are complex and funding sources may be mixed, the value of this coherence is especially high because it simultaneously strengthens compliance, budget control, and managerial transparency.

Discussion

The findings of the study confirm that analytical and synthetic payroll accounting in budgetary organizations should be interpreted as a unified control architecture rather than as two parallel technical procedures. In theoretical terms, synthetic accounting performs the function of financial representation, while analytical accounting performs the function of verification and managerial explanation. In practical settings, particularly in higher education institutions with diversified staffing structures, the absence of coherence between these levels transforms payroll accounting into a mechanical calculation process detached from budget governance and internal control objectives.



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One of the central issues emerging from the results is the tendency of organizations to prioritize automation over methodological clarity. Implementation of payroll software is often perceived as sufficient modernization; however, without a clearly defined analytical dimension system and account mapping logic, automation merely accelerates error propagation. The discussion therefore emphasizes that digitalization must be preceded by conceptual design of payroll accounting architecture. This includes determining mandatory analytical attributes, codifying remuneration types, aligning them with synthetic accounts and budget classification codes, and establishing reconciliation protocols. Only after this conceptual stage can software configuration deliver reliable outcomes.

In the context of a transport university's economic management, payroll is linked to strategic planning, academic workload distribution, and research project financing. The discussion highlights that analytical accounting enables differentiation of payroll costs between teaching, research, and administrative functions. Such differentiation is critical for calculating program costs, assessing departmental efficiency, and preparing financial justification for budget requests. Synthetic accounts alone cannot provide this depth of analysis; they only present total expense amounts. Therefore, the study reinforces the argument that analytical detail enhances managerial rationality and supports performance-based budgeting approaches.

Another significant discussion point concerns compliance and audit readiness. Budgetary organizations operate in a regulatory environment where documentation and traceability are essential. The dual accounting structure becomes a preventive mechanism against irregularities. Analytical registers provide evidence of authorization and calculation correctness at the employee level, while synthetic balances provide confirmation that all obligations and expenses are completely and accurately recorded. The alignment between these levels reduces audit queries and accelerates external review processes. Where reconciliation is weak, discrepancies accumulate, increasing the risk of qualified audit opinions or financial sanctions.

The study also addresses the human factor in payroll accounting. Even the most sophisticated analytical structure depends on the professional competence of



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accounting personnel. Misinterpretation of remuneration rules, incorrect configuration of analytical codes, or neglect of reconciliation procedures can undermine system reliability. Therefore, continuous professional development in public sector accounting standards and internal control methodologies is identified as a necessary condition for sustainable payroll accounting quality. In universities, where accounting staff interact closely with HR departments and academic units, cross-functional communication is equally important to ensure accurate data input and timely updates of staffing changes.

From a risk management perspective, the discussion integrates payroll accounting into the broader framework of institutional governance. Payroll expenses represent recurring and high-value transactions; thus, they are inherently exposed to risks of fraud and error. Analytical accounting supports risk identification by enabling variance analysis at granular levels, such as unexpected increases in specific allowance types or irregular payment patterns within departments. Synthetic accounting, in turn, supports risk detection through balance analysis, trend monitoring, and comparison with budget appropriations. When both perspectives are combined, risk signals become visible earlier and more clearly.

The research further contributes to the discourse on public sector transparency. In institutions financed from public funds, stakeholders require assurance that remuneration practices are lawful and aligned with approved staffing structures. The integration of analytical and synthetic accounting enhances transparency by making it possible to substantiate aggregated payroll figures with detailed evidence. This transparency strengthens trust in financial management and supports institutional reputation.

The discussion acknowledges limitations related to the diversity of regulatory environments and institutional structures. Although the study draws generalized conclusions applicable to budgetary organizations, specific account codes and reporting formats may vary depending on national standards and sectoral instructions. Nevertheless, the conceptual principles identified—clear analytical dimension design, consistent account mapping, regular reconciliation, and integration with internal control—retain universal relevance.



In conclusion, the discussion reinforces that analytical and synthetic payroll accounting should not be viewed as hierarchical or competing mechanisms. Instead, they represent complementary layers of the same financial information system. Their effective interaction creates a closed control loop in which primary data are validated, aggregated, reported, and reconciled in a consistent and transparent manner. For a transport university operating within a budgetary framework, such integration is a prerequisite for sustainable financial management, regulatory compliance, and strategic resource allocation.

Conclusion

The study concludes that analytical and synthetic accounting of payroll in budgetary organizations forms a single methodological system that ensures both financial statement integrity and operational control over labor-related expenditures. Synthetic accounting fulfills the role of consolidated representation of payroll expenses, wage liabilities, and related settlements, while analytical accounting provides the detailed structure required for verification, classification accuracy, and managerial interpretation. The effectiveness of payroll accounting, therefore, is determined not by the separate quality of each layer, but by the coherence of their interaction and the stability of reconciliation procedures that connect individual employee-level records with general ledger balances.

The research confirms that the most material improvements in payroll accounting quality arise from three interrelated measures. The first measure is standardization of analytical dimensions, including consistent identification of employees, structural units, payment types, periods, funding sources, and cost centers or program codes. This standardization transforms analytical accounting from a passive register into an active instrument of control and reporting, enabling the organization to explain and reproduce synthetic totals without manual adjustments. The second measure is formalization of account mapping logic through matrices that link each remuneration type and funding source combination to the correct synthetic account and budget classification item. Such mapping reduces classification errors, strengthens budget execution discipline, and supports transparent reporting to supervisory bodies. The third



measure is institutionalization of reconciliation routines at month-end, ensuring that analytical totals match synthetic balances and that discrepancies are promptly identified, documented, and corrected.

For transport universities, where payroll structures are complex due to diversified staffing models and mixed funding sources, these measures have particular significance. A coherent analytical-synthetic payroll accounting framework enables accurate allocation of costs across teaching, research, and administrative functions, supports timely monitoring of spending limits, and strengthens evidence-based management decisions related to staffing and incentives. At the same time, robust documentation and traceability reduce audit exposure, improve compliance confidence, and increase stakeholder trust in the legitimacy of remuneration practices financed from public resources.

Overall, the study affirms that payroll accounting in budgetary organizations should be designed as an integrated control architecture that connects HR data, primary documentation, calculation logic, budget classification, general ledger aggregation, and financial reporting into a consistent information loop. The practical implication is that sustainable improvement in payroll accounting requires not only automation but also methodological design, disciplined procedures, and professional competence. Implementing these principles allows budgetary organizations to enhance transparency, reduce errors and irregularities, and ensure that payroll expenditures are both legally justified and analytically manageable within the framework of public financial governance.

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