Identifying and Evaluating a Model for Enhancing the Assessment of Internal Controls and Accounting Systems

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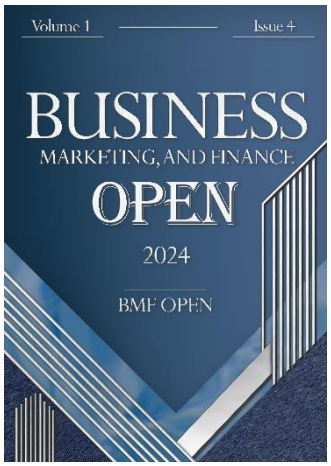

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Abstract: The objective of this study is to identify and evaluate a model to enhance the assessment of internal controls and accounting systems. The study is categorized as an applied-developmental research project. Using purposive sampling, 20 experts in the fields of accounting, auditing, financial management, and organizational management were interviewed. In the quantitative phase, all active participants in the accounting domain, with an unlimited population, were considered, and based on Cochran's formula, the sample size was determined to be 384 individuals. Data analysis in the qualitative phase employed grounded theory using ATLAS.ti software, while structural equation modeling was used for validation via SMART-PLS software. Based on the designed model, several categories were identified. Causal factors include human resource management, personality traits of accountants, ethical values of accountants, managers' attitudes toward accountants, and accountants' specialized knowledge. Contextual conditions encompass financial discipline, laws and regulations, information transparency, receptiveness to criticism, accountability, and the state of accounting. Intervening conditions highlight the weakness of regulatory bodies, financial pressure, environmental conditions, negligence, and socio-cultural conditions. Strategies focus on education, infrastructure development, financial reporting targeting, policy-making, and information technology. Outcomes include improved organizational image, business growth, and economic productivity. To ensure the effectiveness of these systems, continuous monitoring and evaluation processes are essential. The results should be communicated to senior management for implementing corrective measures based on the findings.

Keywords: Internal accounting controls, accounting information systems, accounting quality

1. Introduction

The role of internal control performance is to provide independent assurance to the board of directors and senior management regarding the quality and effectiveness of risk management systems and internal auditing processes [1]. The purpose of evaluating internal auditing mechanisms within the framework of regulations is to determine whether this function possesses sufficient capacity, organizational independence, and authority to effectively perform its duties [2]. Empirical evaluations also examine whether internal audits comply with international standards [3]. Internal control should engage with internal auditing through a functional reporting line and periodic reviews of internal audit programs, resources, performance, and the implementation of recommendations [4]. These monitoring methods are reinforced through accountability mechanisms, including the publication of annual activity reports and performance reviews (e.g., self-assessment if conducted) [5].

An internal control system acts as a critical component of corporate management and serves as a foundation for secure, flawless, and error-free operations in financial organizations (Lombardi et al., 2021). Furthermore, it is considered an essential requirement for companies to conduct operations accurately and enhance the sustainability of the financial system [6]. The benefits of internal controls and their sustainable characteristics are derived from an analysis of causes that have led to significant losses for many organizations (Deswarte, 2022). Analyses conducted by external oversight committees indicate that the inadequacy of internal control systems is the primary factor behind these losses [2]. Based on numerous studies, the importance of experienced and qualified management, appropriate internal auditing, and independent auditing has been emphasized, with recommendations that internal oversight should focus on strengthening internal control systems and continuously evaluating their effectiveness [7].

Despite the unparalleled positive impact of internal controls on the efficient management of financial institutions and the legal requirements for their implementation, evaluation, and reporting, internal control assessments—at least in terms of financial reporting and the legal responsibilities of management and independent auditors—are not performed effectively in Iran under the current circumstances for several reasons [8]. These reasons include deficiencies in the design, implementation, evaluation, and reporting of internal controls, leading to a lack of proper alignment of internal controls with managerial needs and legal objectives. Some examples of control deficiencies in Iranian companies include:

In all cases where organizations have experienced losses, it is observed that neglect and indifference by managers toward a control culture, inadequate guidance, and errors by board members and senior managers, as well as a lack of clarity in managerial accountability through the assignment of responsibilities and principles of accountability, are evident. These cases also demonstrate the absence of proper incentives for managers to conduct robust linear oversight and maintain a high level of control-oriented thinking in business contexts [9].

Many financial institutions and organizations that have faced severe losses have shown inefficiency in identifying and assessing risks related to new or updated products and activities during significant changes in the environment or business conditions. Several cases indicate that control systems suitable for traditional or simple services are incapable of managing complex services [10].

In organizations facing challenges, deficiencies in the structure and fundamental control activities, such as the segregation of duties for approval, verification, compliance, and operational functions, have been observed [11].

For the successful implementation of policies and procedures, it is essential to ensure all employees are informed. In many cases, organizational losses are attributed to a lack of awareness or understanding of company policies by employees. Additionally, information related to undesirable activities that should be reported to higher management levels is not properly communicated, making problem resolution more difficult. In some instances, information in management reports is insufficient or inaccurate, potentially leading to misdiagnosis of business conditions [12].

In many cases, auditors do not make sufficient efforts to identify and report control deficiencies in problematic organizations. Furthermore, in some cases, auditors report issues, but there are no mechanisms to ensure management addresses the deficiencies [13, 14].

An effective internal control system must have the capability to prevent or detect issues before losses occur or at least mitigate their extent. Therefore, an effective internal control system is a critical factor in achieving long-term success and desired profitability objectives for companies. Implementing, evaluating, and monitoring effective internal control systems is a key determinant of financial reporting quality. High-quality internal controls

specifically reduce the deliberate manipulation of reported information to external parties, minimize the risk of procedural and estimation errors in reports, and mitigate the inherent risks of business operations.

It is evident that internal control plays a vital role in the successful operation of companies. This study evaluates how internal control reporting systems contribute to safeguarding assets against financial fraud. It examines the extent of internal control system implementation, assesses the effectiveness of these systems in detecting and preventing fraud, and investigates the impact of fraud on a company's financial performance in terms of profitability, liquidity, and operational efficiency within the framework of internal control reporting requirements. Consequently, this research seeks to answer the question: How can the improvement of internal control assessments and accounting systems be enhanced?

2. Methodology

This research is situated within the interpretive paradigm philosophically, adopts an inductive approach in its execution, and is classified as applied research in terms of purpose. It follows a mixed-methods approach (qualitative-quantitative). For developing the initial model, grounded theory was employed. The potential participants included all scholars, experts, and specialists in financial management and accounting. Purposeful sampling was used to select individuals who participated in the qualitative phase of the research through interviews. For determining the participants and selecting this group of experts, a purposeful sampling method was utilized.

In this study, the primary data source was interviews. The initial interviews were exploratory and descriptive. Gradually, after conducting each interview, the data were coded iteratively, employing constant comparative methods. Open coding was performed to identify theoretical codes. This process continued through the coding of 20 interviews, during which concepts and subcategories emerged. It is noteworthy that saturation and condensation of the core categories were achieved using theoretical sampling. Each interview lasted between 30 to 50 minutes. For analyzing the qualitative data, grounded theory was applied using ATLAS.ti software. The qualitative data analysis was carried out in three stages: open coding, axial coding, and selective coding.

Following the identification of preliminary indicators, data were collected using a five-point Likert scale questionnaire to validate the final research model. To determine the content validity ratio (CVR) of the questionnaire, it was presented to 10 specialists in the field. The acceptable CVR threshold was set at 0.67. After calculating the CVR, a value of 0.81 was obtained, confirming that all the questionnaire items were valid.

The statistical population of this research included graduates, specialists, and practitioners in the fields of accounting and auditing. This population was considered unlimited. Given the unlimited population, the sample size was calculated using the following formula:

$$n = \frac{Z{\propto/_2}^2 \times p(1-p)}{\varepsilon^2} = \frac{(1.96)^2 \times,5 \times,5}{(.05)^2} \cong 384$$

In this study, the confidence level was 95% ($\propto = 0.05$), and the margin of error (ε) was set at 0.05. The standard deviation was calculated as σ = (5 - 1) / 6, resulting in a value of 0.677. The questionnaire was distributed electronically. Structural equation modeling (SEM) in SMARTPLS software was used to fit the model.

3. Findings

According to the frequency observed among participants in the qualitative phase of the study, 50% of the participants were women, and 50% were men. In terms of age distribution, 11.11% of participants were between 30-40 years old, 38.89% were between 40-50 years old, and 50% were over 51 years old.

For open coding, all interviews were entered into ATLAS.ti software, thoroughly examined, and relevant codes were extracted. Labeling of codes was based on the interviews, with the researcher ensuring adherence to the participants' perspectives to minimize potential biases. Throughout the coding process, the researcher maintained theoretical sensitivity—a key principle of grounded theory—to enrich the study. Following the dimensions of the grounded theory model proposed by Strauss and Corbin (1998), the identified codes were categorized, as shown in Table 1.

Table 1. Open Coding of Qualitative Data

Selective Code	Core Category	Initial Codes
Causal Conditions	Human Resource Management	Collaborative spirit, flexibility and adaptability, encouraging patience under psychological pressure, fostering individual creativity, comprehensive support for accounting staff, learning organization environment, motivation through reward systems, aligning hierarchy with specialization, periodic training, promoting accountability, empowering accountants for responsiveness.
	Personality Traits	Active listening, empathy, respect for others' rights and beliefs, conflict management, trust-building, strong communication skills, consensus-building, systemic thinking, strategic thinking, possibility-oriented thinking, emotional intelligence, cultural intelligence, political intelligence, numerical intelligence, critical thinking, analytical thinking, logical thinking.
	Ethical Values	Transparency, fairness, accountability, honesty, adherence to professional ethics, conscientiousness, respect for ethical principles, compliance with religious values, national loyalty, safeguarding stakeholders' interests, customer orientation, avoiding favoritism and lobbying.
	Managers' Attitudes	Encouraging self-assessment, promoting participatory management systems, maintaining collegial interactions with accountants.
	Specialized Knowledge	Understanding accounting processes, organizational relationships, familiarity with modern accounting technologies, awareness of laws and regulations, contemporary accounting knowledge, human resource expertise, managerial and technical knowledge, industry-specific insights, proficiency in management concepts, modeling issues.
Strategic Conditions	Education	Strengthening industry-university connections, increasing ethics in curricula, raising academic specialists in accounting, forming professional associations, ethics workshops.
	Infrastructure	Easy access to resources, adequate funding for evaluation, reputable auditors, creating monitoring units, incentive systems for participation, strengthening internal oversight, ethical training infrastructure, fostering proper accounting culture.
	Financial Reporting Goals	Transparency, quality, speed and accuracy of financial reporting, alignment of performance and documentation, timely reporting, diverse reporting.
	Policy-Making	Security and legal frameworks, transparency incentives for accountants, short- and long-term strategies, aligning strategies and resources, oversight systems.
	Information Technology	Integration of technology in financial reporting, encryption, blockchain, AI algorithms, data mining for system evaluation.
Outcomes	Improved Organizational Image	Stakeholder trust, employee motivation, customer confidence, financial facilitation, investor attraction, organizational credibility, positive reputation, customer retention and acquisition, talented employee recruitment.
	Business Growth	Healthy competition, sustainable advantages, ethics-driven innovation, increased stock value, reduced legal and financial risks, efficiency improvement, ethics development, cost reduction.
	Economic Productivity	Foreign investment, national economic growth, evaluation cost reduction, stable income, reduced tax evasion, public trust improvement, corruption reduction, enhanced accounting processes, job creation, entrepreneurship, market prosperity.
Contextual Conditions	Financial Discipline	Accurate revenue and expense recording, proper system performance, adherence to principles, precise tax compliance, transparency, unbiased reporting.
	Laws and Regulations	Compliance with accounting standards, strategic and internal policies, tax laws, updated regulations.

	Transparency	Clear and accessible information, comprehensive reports, proper stakeholder communication, timely and complete disclosures.
	Criticism and Accountability	Avoiding conflicts of interest, addressing feedback, error correction, avoiding manipulative behaviors, accepting responsibility.
	Accounting Status	Accounting laws, organizational environment, execution methods, international standards, personalization, hierarchy, reputation, adaptability.
Intervening Conditions	Weak Oversight	Lack of inspections, favoritism, corruption, lobbying, contradictory laws, inefficacy of penal codes, political behavior.
	Financial Pressure	Unmet financial targets, exchange rate volatility, economic instability, excessive funding needs, reliance on investor attraction.
	Environmental Conditions	Rapid global market changes, competitive pressure, operational barriers from sanctions, rigid structures, inefficiencies.
	Negligence	Managerial indifference, neglect of justice, resistance to transparency, short-term focus, prioritizing personal interests.
	Cultural and Social Factors	Outdated managerial thinking, resistance to modern tools, lack of training, reliance on traditional methods, cultural resistance to evaluations.

A total of 714 questionnaires were distributed electronically, and 380 valid responses were obtained. Among the respondents, 266 individuals (70%) were male, and 114 individuals (30%) were female. Thirty respondents were under the age of 30, representing 26% of the sample size. Additionally, 100 respondents were aged between 31 to 40, and 81 respondents were above 51 years old. The educational background of the participants included 131 individuals with bachelor's degrees, 107 with master's degrees, and 146 with doctoral degrees.

To describe the main variables of the study, descriptive statistics such as mean, standard deviation, skewness, kurtosis, and variance were utilized, as shown in Table 2.

Table 2. Descriptive Statistics of Research Variables

Variables	Mean	Skewness	Kurtosis	Variance	Minimum	Maximum
Causal Factors	4.101	0.435	0.132	0.599	2	5
Contextual Factors	3.373	1.123	-0.150	0.745	2	5
Intervening Factors	3.192	-0.756	-0.399	0.376	2	5
Strategies	3.408	0.865	0.475	0.896	2	5
Outcomes	3.555	-0.538	0.746	0.576	2	5

Based on the mean values, it is evident that the "high" option was the most frequently chosen by respondents. The highest mean belongs to the causal factors. Furthermore, the skewness and kurtosis values are within the range of (-2, 2), indicating that the data are symmetrical and follow a normal distribution. Since Partial Least Squares (PLS) is derived from linear regression, the assumptions related to regression data must also be examined in this approach. Each hypothesis was analyzed individually using the PLS technique, and the overall model was also tested using this technique.

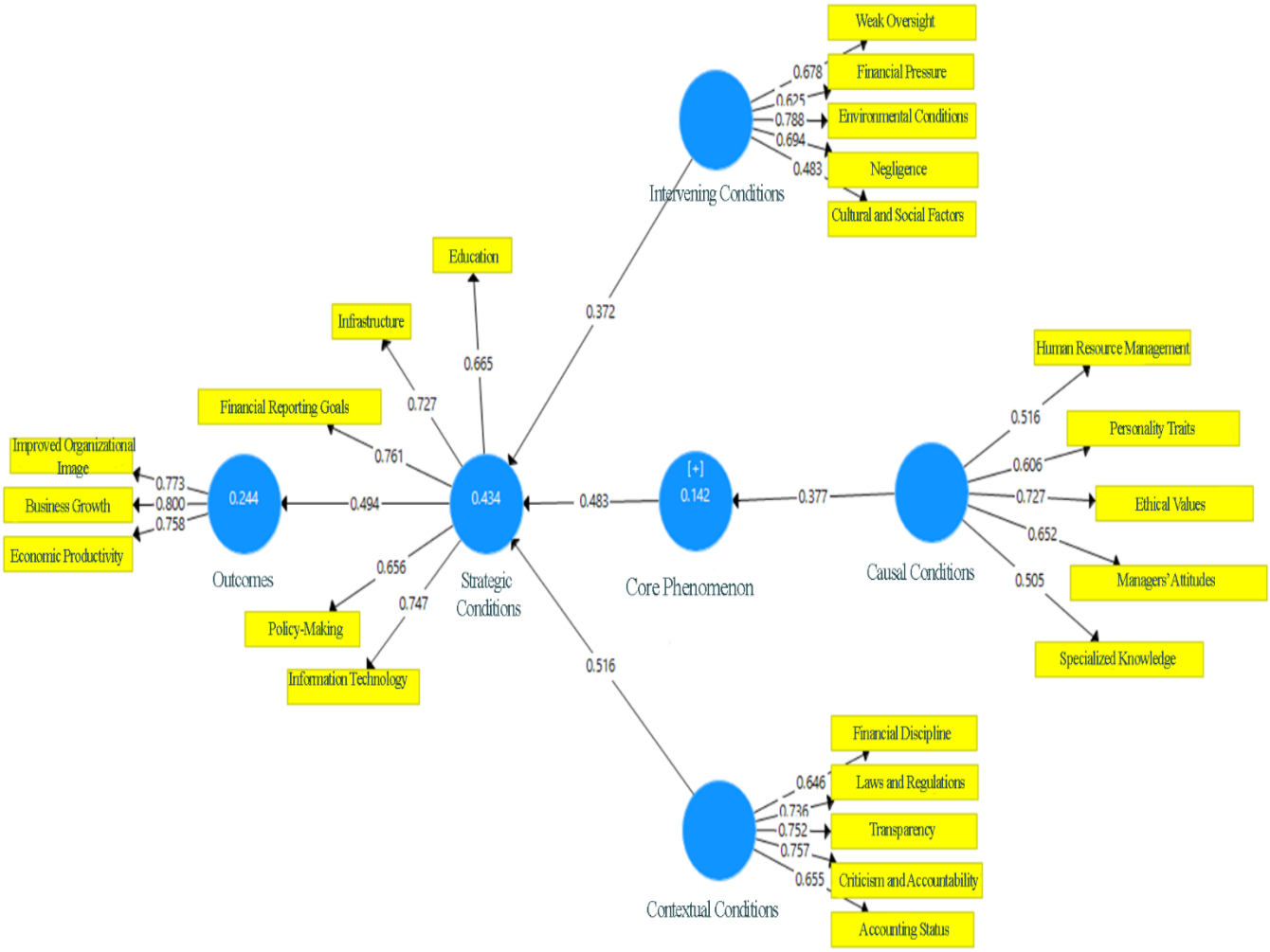

Figure 1. Factor Loadings of the Research Model (Outer Model)

To assess convergent validity, Cronbach's alpha, Average Variance Extracted (AVE), Composite Reliability (CR), and the Rho coefficient were utilized. The following relationships apply:

- CR > 0.7
- CR > AVE
- AVE > 0.5

Table 3. Convergent Validity and Reliability of Research Variables

Components	Cronbach's Alpha	AVE	CR
Causal Factors	0.858	0.646	0.810
Core Category	0.722	0.621	0.846
Contextual Factors	0.814	0.649	0.849
Intervening Factors	0.776	0.647	0.840
Strategies	0.738	0.638	0.814
Outcomes	0.836	0.694	0.865

According to Table 3, Cronbach's alpha for all variables is above 0.7, confirming the reliability of all variables. The AVE values are consistently greater than 0.5, verifying convergent validity. Additionally, CR values are higher than both AVE and 0.7, indicating appropriate reliability and validity for each construct in the model. The Rho coefficient values are also above 0.7, further confirming reliability.

Discriminant validity examines the relationship between a construct and its indicators compared to other constructs. A model exhibits acceptable discriminant validity when a construct interacts more strongly with its own indicators than with those of other constructs. The main feature of this matrix is that the diagonal values are all equal to one. The diagonal values are then replaced with the square roots of the AVE values, as presented in Table 4.

Table 4. Fornell-Larcker Criterion

	Causal Factors	Core Category	Contextual Factors	Intervening Factors	Strategies	Outcomes
Causal Factors	0.887					
Core Category	0.596	0.856				
Contextual Factors	0.410	0.699	0.847			
Intervening Factors	0.589	0.554	0.632	0.902		
Strategies	0.537	0.635	0.773	0.548	0.888	
Outcomes	0.439	0.538	0.719	0.420	0.628	0.836

As shown in Table 4, the diagonal values in the matrix are larger than all other values in their respective columns, indicating that the model possesses appropriate discriminant validity.

Table 5. Hypothesis Testing and Path Analysis

Hypothesis	Path Coefficient	T-Statistic	Significance Level	Status
Causal Factors significantly impact Core Category	0.377	9.061	0.000	Confirmed
Core Category significantly impacts Strategies	0.483	3.386	0.000	Confirmed
Strategies significantly impact Outcomes	0.494	7.668	0.000	Confirmed
Intervening Factors significantly impact Strategies	0.372	7.637	0.000	Confirmed
Contextual Factors significantly impact Strategies	0.516	4.656	0.000	Confirmed

Based on the structural equation modeling results, all path coefficients exceed 0.3, and significance levels are below 0.05 ($p = 0.000$). Therefore, all hypotheses are confirmed with 95% confidence.

4. Discussion and Conclusion

The aim of this study was to identify and evaluate a model to enhance the assessment of internal controls and accounting systems. Internal controls and accounting systems play a critical role in the management and performance of organizations. One of the fundamental principles of internal controls is to ensure the accuracy and integrity of financial and operational information. These controls and accounting systems clearly define who is authorized to execute an activity, how these activities should be carried out, how information is recorded and tracked, and how financial information is reported. This aspect of management ensures improved decision-making processes, reduces financial risks, and prevents financial fraud.

This research employed an exploratory, mixed-methods approach, utilizing both qualitative and quantitative methodologies. In the qualitative phase, grounded theory was applied to analyze specialized texts and conduct interviews with experts and specialists. Subsequently, the proposed model was validated using structural equation modeling. The study proposes a model that emphasizes the need for approaches and strategies to improve the

assessment of internal controls and accounting systems from multiple perspectives to positively impact organizational operations.

The first step in this direction is fostering and strengthening an organizational culture based on ethics and values of transparency and accuracy in information. Managers should enhance employee awareness through related ethics and technology training. Promoting a collaborative culture and encouraging the advancement of modern information and accounting systems are also of significant importance. Previous studies align with the findings of this research, confirming the quality of accounting information and the evaluation of internal controls [12, 15-17].

The responsibility for internal control systems in every organization lies with its management, and one of the most critical internal controls implemented in large companies in developed countries today is internal auditing. This control significantly impacts the fulfillment of the needs of internal audit stakeholders. Studies also demonstrated that weak internal controls contribute to reduced company profitability [3, 6, 18-21].

Effective assessment of internal controls and accounting systems plays a key role in ensuring the accuracy of financial information and increasing organizational transparency. One way to improve this assessment is to focus on integration and close collaboration among various organizational departments. This approach ensures that internal controls are used not only for identifying and managing financial risks but also for addressing operational risks and ensuring regulatory compliance.

Using modern technologies such as artificial intelligence and data analysis tools can enhance the evaluation processes by analyzing data more accurately and in less time. Additionally, improving internal control assessments requires fostering an organizational culture based on transparency, honesty, and accountability. When employees at all organizational levels are aware of their role in maintaining and improving internal controls, and when there is individual and collective accountability, evaluations will be more precise and reliable.

Continuous training for employees on the principles of accounting and internal controls can also significantly enhance these assessments. Such training should enable employees to understand complex issues and new challenges effectively and provide suitable solutions.

Finally, leveraging digital technologies and automation systems can increase the accuracy and efficiency of internal control and accounting assessments. Digital tools can minimize human errors and provide more accurate data for analysis and evaluation. These technologies help organizations assess their internal controls in real time and respond quickly to potential threats or weaknesses.

In conclusion, a combination of international frameworks, strong organizational culture, continuous training, and modern technologies can lead to significant improvements in internal control and accounting system assessments. To achieve better internal control evaluations, organizations must thoroughly document their processes and activities, which can be facilitated by using content management software and systems. An independent evaluation process should then be established, including periodic and continuous reviews conducted by individuals outside the evaluated unit to ensure fair and accurate reviews.

Creating a culture of positive feedback and continuously improving evaluation systems can contribute to the sustainable enhancement of internal control and accounting system assessments. This involves encouraging employees to report any deficiencies or flaws in the systems, as well as enhancing feedback and corrective processes to improve performance. Thus, organizations can achieve sustainable improvements in their internal control and accounting system assessments, minimizing operational risks.

Recommended Strategies for Improvement:

- Enhance employee awareness and skills in evaluating internal controls and using modern accounting systems through training courses and practical workshops.
- Develop continuous training programs emphasizing professional ethics and technical skills related to accounting and internal controls.
- Improve technical and IT infrastructure used in accounting and internal controls, including updates to software and hardware systems.
- Establish flexible and adaptable organizational structures to meet the needs of technological advancements and new accounting approaches.
- Define and visualize specific, measurable objectives for financial reporting to facilitate better decision-making and internal assessments.
- Use appropriate tools and technologies for aggregating and analyzing financial data, producing reliable and accurate reports.

Authors' Contributions

Authors equally contributed to this article.

Ethical Considerations

All procedures performed in this study were under the ethical standards.

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Conflict of Interest

The authors report no conflict of interest.

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