

# The Role of Accounting-Based Decision Support Systems on Business Management Decisions in Private Banks in Erbil

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**Abstract**—This study explores the role of accounting-based decision support systems in enhancing business management decisions in the context of private banks in Erbil, Kurdistan Region, Iraq. The research focuses on three key components: Internal Control Systems, Decision-Making Tools and Techniques, and Financial Accounting Information – proposing that each plays a significant role in improving the quality and effectiveness of managerial decision-making. A quantitative research method was adopted to investigate these relationships. Primary data were collected using a structured questionnaire distributed to Finance and Accounting Managers, Accountants, and Auditors working in private banks across Erbil, specifically Cihan Bank, Kurdistan International Bank, Region Trade Bank (RT Bank), and the Trade Bank of Iraq. A total of 120 questionnaires were distributed using simple random sampling, of which 94 valid responses were returned, resulting in a response rate of 78.33%. The collected data were analyzed using the Statistical Package for the Social Sciences version 26 to test the three proposed hypotheses. The findings reveal that all three independent variables, namely Internal Control Systems, Decision-Making Tools and Techniques, and Financial Accounting Information, have a statistically significant positive effect on business management decisions. These results align with existing literature and highlight the importance of robust accounting systems in supporting strategic and operational decision-making in the banking sector. The study offers practical insights for enhancing decision-making efficiency and strengthening management practices in private financial institutions.

**Keywords**—Business management decisions, Decision-making tools, Financial accounting information, Internal control systems.

## I. INTRODUCTION

In a competitive and strategically complex environment, namely banking, the quality of managers' decisions is of fundamental importance for the success of the bank. For business managers to make quality decisions, they depend largely on accurate, timely, and relevant financial information to be provided to them (Nkwinika and Akinola, 2023). Accounting-based decision support systems (DSS) have developed into indispensable concepts for the integration of core finance-related activities, in particular internal control systems, financial accounting, and decision support in strategic and operative decision-making processes (Lehner et al., 2022). These systems integrate structural databases and financial reports with analytical tools that enable managers to obtain actionable information for planning, budgeting, risk

mitigation, and performance appraisal (Basiru et al., 2023; Shareef, 2023). They do not only improve the accuracy and reliability of financial information but also promote transparency, accountability, and effective allocation of resources (Efunniyi et al., 2024; Karam, 2019).

Internal control mechanisms that guarantee the accuracy, reliability, and secure handling of financial information; tools that can aid decision-making through the offering of an analytical approach by which various policy options can be assessed; and financial accounting systems that can present a sound overview of an institution's financial standing (Asiligwa and Rennox, 2017; Efunniyi et al., 2024; Mesioye and Bakare, 2024). All components of business management are designed to bolster business management, as decision makers are provided with data-based insight and structured support in handling cross-functional business problems.

In spite of the wider adoption of information systems and of digital tools in business operations in current times, many organizations are still struggling to ensure that financial information, internal control mechanisms, and decision processes are cohesive (Monteiro et al., 2021). Despite researchers exploring internal controls, financial accounting, and decision-making tools independently (Rangkuti, 2024), there is scant evidence regarding how these elements collectively operate, as components of accounting-based DSS, to influence managerial effectiveness.

This paper is based on an understanding that scholars working in this area emphasize either the technological aspect of DSS or the theoretical aspects of financial decision-making, often failing to address the practical incorporation of accounting activities within managerial decision-making processes (Alsharari, 2024). This deficiency is particularly pronounced in emerging or transitional economies where internal control systems and financial reporting procedures may be insufficiently developed. In such area like Erbil-KRI which bank system is getting more dynamic, the efficiency of integrated accounting-based DSS, especially in private banks, is still under-researched.

The purpose of this paper is to explore how accounting-based DSS improves business management decisions. It is concerned specifically with the integration of internal control, financial accounting information, and decision-making tools and methods. Through analysis of the interactive effects of these factors on managerial decision-making, the study aims to offer greater insight into how financial information systems can best be used to enhance organizational performance, accountability, and strategic flexibility. The focus of the study will be on private banks in Erbil, and hence, findings from the research will be contextually and operationally useful.

The theoretical and practical significance of this research is two-sided. It contributes to the relatively scarce literature on integrated accounting-based DSSs, especially in transitional economies, by investigating the relationship among internal controls, financial accounting, and decision support tools. On the practical aspect, it provides insight to bank managers and policy makers in Erbil to enhance the decision-making system, efficiency, transparency, risk management, and strategic responsiveness for the banking industry.

## II. CONCEPTUAL FRAMEWORK AND HYPOTHESES DEVELOPMENT

### *A. Internal Control Systems and Management Decisions*

Internal control systems play a fundamental role in safeguarding organizational assets, ensuring the accuracy of financial reporting, and promoting operational efficiency. It is a process conducted by board of directors, management, and other personnel, which is established to provide reasonable, but not absolute, assurance about an organization's operations, reporting, and compliance with applicable laws, regulations, and policies (Shareef, 2025). These systems have been gradually acknowledged not only in facing control and risk challenges but also as contributors for strategic management decisions (Monteiro et al., 2021).

Indeed, a number of studies have highlighted the fact that strong internal control systems lead to timely and accurate financial reporting, less susceptibility to fraud, and greater transparency, which are key inputs into managerial decision-making. For instance, Koutoupis and Malisiovas (2023) reported that effective internal controls increase financial performance by facilitating better planning and decision-making in US commercial banks. They also emphasized that good internal controls have a positive impact on the decision quality by giving the right information and reducing financial anomalies, particularly in developing countries.

According to Musyoki (2023), the internal control system can enhance managerial performance as the company is able to monitor and evaluate its operations better. Their results indicate that firms with effective internal audits and controls make better and faster decisions. Furthermore, Otoo et al. (2021) stated that weak internal controls are related to low financial reporting quality, which can cause managers to have the wrong understanding and make appropriate business decisions.

Within a more general, organizational setting, Manginte (2024) showed that internal control rent as an essential part of corporate governance practices mitigates agency problems, improves strategic decision-making where the effective running of decision-making has more impact in companies where decentralization increases the risk of errors and forgetfulness. Their article supports the notion that not only the safety instrumented systems but also control systems should not just act as passive safety barriers but should also be viewed as active enablers in risk and data-based decision-making. Even though recognition is increasing regarding the significance of internal control systems, they are frequently regarded as regulatory or audit functions rather than a source of managerial information (Ghonim et al., 2022). Thus, analyzing the positive impact of internal control systems on management decisions is still a hot issue for future research. Thus, the following hypothesis is proposed:

$H_1$ : Internal control systems have a significant positive effect on business management decisions.

### *B. Decision-Making Tools and techniques, and Management Decisions*

Efficient decision-making is a key factor to the success in a dynamic field of business. Structured decision-making methods and tools are increasingly being adopted by firms to increase the accuracy, speed, and quality of managerial decisions (Goyal et al., 2022). Such tools are various decision-making techniques and structures, including cost-benefit analysis, SWOT analysis, decision trees, scenario planning, forecasting models, and data-driven dashboards that enable managers to take a structured approach to comparing alternatives and identifying preferred actions (Nesindande et al., 2024; Massoudi, 2022).

Decision-making is a process of rational choice, of considering options, weighing consequences, and choosing the best option (Ranjan, 2025). Fortified by this, contemporary

studies focus on decision-support tools to improve this process. Further, decision aids are components of DSS, and they are used in the support of semi-structured and unstructured managerial decisions based on non-quantitative factors as well as quantitative models, simulations, and data visualization (Tansuchat and Thaicharo, 2025).

Empirical research indicates that companies which practice structured decision-making outperform those that operate on intuition or casual methods. As an example, Hasan and Chowdhury (2023) identified that formal planning tools and analytical techniques enhance decision comprehensiveness and, thus, informed and effective strategic decisions. Likewise, Al-Okaily (2025) points to the lowering of uncertainty through the use of quantitative tools, particularly in complex or high stakes decision-making. Nwazomudoh et al. (2021) highlight that decision-making technologies and instruments are used to analyze trends and forecast results as well as the promotion of a set of coordinated and interconnected decision mechanisms by means of improved coordination of action between departments. Other than in the operating room, Rauf et al. (2024) noted that structured tools contribute toward prioritization and the optimization of resource allocation, in addition to the reduction of risk in business decisions. Moreover, Omowole et al. (2024) found that in SMEs, applying decision-making tools has positive effects on increased strategic agility and better responsiveness to market changes. Their results are consistent with the view that decision tools are not only limited to big companies but also useful for small businesses in limited resource environments.

The adoption and successful implementation of decision support tools may be impeded by a lack of training, data quality issues, or inertia. This underscores an enduring neglect, in practice and in research, about the organizational conditions required to ensure that such instruments can be used in a decision-making context. Thus, examining the effects of tools and techniques to make decisions on business management decisions, particularly in service-based or emerging market firms, will further our understanding of how organizations can better ensure the quality of their decisions, minimize the level of risk involved in them, and maximize the level of firms' performance (Massoudi, 2023). As a result, the following hypothesis was formulated:

H<sub>2</sub>: Decision-making tools and techniques have a significant positive effect on business management decisions.

### C. Financial Accounting Information and Management Decisions

Financial accounting is a procedural system that lays down the rules for recording, summarizing, and reporting an organization's financial performance and position (Efunniyi et al., 2024). The financial accounting information is an essential for important decisions concerning business management, for example, budgeting, investment, cost control, and strategic planning (Hamed, 2023). Thus, integration of the financial accounting information in the

decision-making process has become so important and fundamental for transparency, responsibility, and intelligent management (Manginte, 2024). Financial accounting allows companies to provide accurate financial information to various stakeholders both inside and outside of the company. For managers, clear and dependable financial statements contribute to evidence-based decisions that are consistent with the goals of their organization. Latifah et al. (2021) assert that high-quality financial data support performance analysis, aid in identifying trends, and provide a basis for setting realistic goals and evaluating outcomes.

The quality of the financial accounting information has also been found to have a strong relation with managerial efficiency. In particular, Al-Okaily (2024) also found that accurate and timely financial reports have a significant effect on working capital management which in turn affects profitability and operational efficiency. Similarly, Zahoor et al. (2024) noted that small and medium-sized enterprises (SMEs) that rely on financial statements for planning and control tend to have better financial performance and more strategic agility. Furthermore, Mesioye and Bakare (2024) stressed that the value or relevance of financial accounting in decision-making rested on its relevance, accuracy, timeliness, and comprehensibility. When these factors are in place as a matter of course, financial information is also a formidable instrument for risk management, scenario building, and resource management.

The contribution of financial accounting to management decisions could be constrained by the complication of reporting standards, earnings manipulation, and low financial illiteracy of the decider (Okeke et al., 2024). This suggests that physical representation of information is indispensable and the internal capacity of understanding financial data must be improved. Considering its importance, the application of financial accounting information in business management decisions remains an area of much relevance, particularly in developing economies where financial reporting is still evolving. From the above, the following hypothesis is proposed:

H<sub>3</sub>: The use of financial accounting information has a significant positive effect on business management decisions

The suggested study framework is shown in Fig. 1 and proposes that internal control systems, decision-making tools and techniques, and financial accounting information impact on business management decisions.

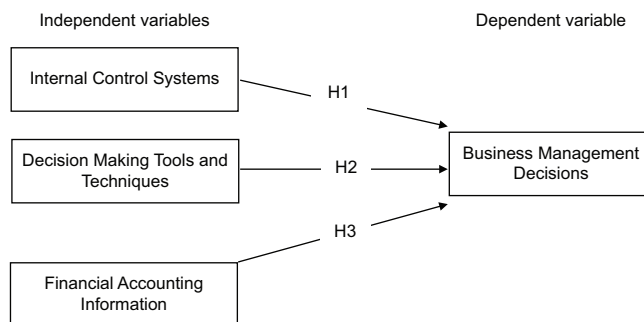


Fig. 1: Conceptual framework of the study.

### III. METHODOLOGY

This study employs quantitative methods as the primary analytical approach. Data were collected through questionnaires distributed to Finance and Accounting Managers, Accountants, and Auditors in private banks located in Erbil, within the Kurdistan Region of Iraq – specifically Cihan Bank, Kurdistan International Bank, Region Trade Bank (RT Bank), and the Trade Bank of Iraq (TBI). Respondents rated the items using a five-point Likert scale, ranging from “strongly agree” (score of 5) to “strongly disagree” (score of 1). The data were analyzed using the Statistical Package for the Social Sciences software, version 26.

#### A. Population and Sample Information

Simple random sampling was used as the sampling technique, with 120 questionnaires distributed to Finance and Accounting Managers, Accountants, and Auditors in private banks in Erbil, such as Cihan Bank, Kurdistan International Bank, Region Trade Bank (RT Bank), and the TBI. A total of 94 valid responses were received, representing a response rate of 78.33%. Detailed information about the sample is presented in Table I.

#### B. Factor Analysis (FA) and Reliability Analyses

Exploratory FA (EFA) can be considered as a procedure used to study associations and relationships between a number of items expected to make up a construct. Factor loading values above .3 is set as the acceptable level, and below that, values are suggested for expungement. Values exceeding .3 reflect strong intercorrelations between items indicating the suitability of the construct (Velicer and Fava, 1998). Therefore, EFA was performed on survey instruments to test for validity and guarantee that each item loads only on the appropriate factor and to a meaningful extent. In addition, reliability analyses were performed to determine the items' internal consistency in representing each component. A Cronbach's alpha ( $\alpha$ ) > 0.7 indicates the reliability of data. The four factors matched the hypothesized research model and included (1) internal control systems which contained (five items)  $\alpha = 0.841$ , (2) Decision-Making Tools and Techniques comprising (four items)  $\alpha = 0.902$ , (3) Financial

Accounting Information (five items)  $\alpha = 0.842$ , and (4) on business management decisions with (five items)  $\alpha = 0.879$  as represented in Table II.

#### C. Correlation of Variables

The Pearson correlation coefficient ( $r$ ) was used to determine the strengths, weaknesses, and direction of the relationship between the independent variables and the dependent variable. This study aims to examine the relationship between Internal control systems, Decision-making tools and techniques, and financial accounting information on business management decisions. The analysis indicates that financial accounting information has the strongest positive correlation with business management decisions ( $r = 0.598$ ,  $P < 0.01$ ), suggesting that accurate and relevant financial data play a critical role in enhancing the quality of managerial decisions. This is followed by decision-making tools and techniques, which also show a strong positive correlation with business decisions ( $r = 0.535$ ,  $P < 0.01$ ). This implies that the application of effective analytical tools and techniques contributes significantly to improving the decision-making process within organizations. Finally, internal control systems also exhibit a positive correlation with business management decisions ( $r = 0.362$ ,  $P < 0.01$ ), though to a lesser extent compared to the other two variables. Table III presents the findings of the correlation analysis

### IV. HYPOTHESES RESULTS AND DISCUSSION

#### A. Hypothesis Testing

The regression analysis output indicates a strong and statistically meaningful relationship between the independent variables – Internal Control Systems, Decision-Making Tools and Techniques, and Financial Accounting Information – and the dependent variable, likely related to Business Management Decisions. The multiple correlation coefficient ( $R$ ) is 0.825, reflecting a strong positive correlation between the predictors and the outcome. The  $R$  square (0.681) suggests that approximately 68.1% of the variance in the dependent variable can be explained by the combined influence of the three predictors. This high  $R^2$  value indicates that the model has a strong explanatory power. The summary of the model is detailed in Table IV.

Table V displays the regression analysis results assessing the effects of three independent variables such as internal control systems, Decision-Making Tools and Techniques, and financial accounting information on the dependent variable, business management decisions. All predictors are statistically significant at the 0.01 level, as shown by the  $P = 0.000$ . Among these, Financial Accounting Information has the strongest influence on business management decisions, with a standardized Beta coefficient of 0.487 and a  $t = 3.986$ , indicating a strong and reliable impact.

Decision-Making Tools and Techniques also play a significant role, with a beta of 0.471 and a  $t = 3.799$ , while internal control systems (ICS) show a slightly smaller but

TABLE I  
DESCRIPTION OF THE SAMPLE INFORMATION

Variable	Criteria	Total	%
Gender	Male	45	47.9
	Female	49	52.1
Age	≤29 years	25	26.6
	From 30 to 41 years	34	36.2
	≥42 years	35	37.2
Experience	≤4 years	16	17
	5–10 years	22	23.4
	11–15 years	27	28.7
	≥16 years	29	30.9
Position	Accountant	39	41.5
	Auditor	32	34
	Finance and accounting manager	23	24.5

TABLE II  
FACTOR LOADINGS OF RESEARCH MODEL ITEMS AND CRONBACH'S ALPHA VALUES

Items	Factor loading ( $\alpha$ )	
ICS1. Our organization has clearly defined internal control procedures that are consistently followed.	0.788	0.841
ICS2. The internal control system in our organization effectively prevents and detects errors or fraud.	0.835	
ICS3. There is regular monitoring and evaluation of the internal control system in our organization.	0.826	
ICS4. All employees are adequately trained to understand and comply with internal control policies.	0.789	
ICS5. The management promptly addresses issues or weaknesses identified in the internal control system.	0.765	
DMTT1. Our accounting department regularly uses decision-making tools such as variance analysis, break-even analysis, and budgeting to support financial planning.	0.859	0.902
DMTT2. The use of accounting software and analytical tools enhances the accuracy and efficiency of our decision-making processes.	0.841	
DMTT3. Management relies on cost-benefit analysis when evaluating financial decisions and investments.	0.852	
DMTT4. Our organization provides adequate training on decision-making techniques to accounting and finance staff.	0.701	
FAI1. Financial reports comply with applicable accounting standards and regulations.	0.896	0.842
FAI2. I trust the financial accounting information used in planning and budgeting activities.	0.873	
FAI3. Financial accounting information is accessible when needed for managerial decisions.	0.891	
FAI4. Errors or inconsistencies in financial reports are rare in my organization.	0.689	
FAI5. The accounting department maintains transparency in financial reporting practices.	0.851	
BMD1. The bank's management makes decisions based on accurate and up-to-date financial data.	0.759	0.879
BMD2. Strategic decisions in the bank are aligned with long-term business goals.	0.787	
BMD3. Management decisions in the bank are driven by customer needs and market trends.	0.806	
BMD4. There is a clear and structured decision-making process followed by the bank's leadership.	0.907	
BMD5. Decisions made by the bank's management have led to improved financial performance.	0.920	

ICS: Internal control systems, DMTT: Decision-making tools and techniques, FAI: Financial accounting information, BMD: Business management decisions

TABLE III  
CORRELATIONS ANALYSIS

Variables	1	2	3
1 Business management decisions			
2 Internal control systems	0.362**		
3 Decision-making tools and techniques	0.535**	0.313**	
4 Financial accounting information	0.598**	0.425**	0.324**

\*\* Correlation is significant at the 0.01 level (2-tailed)

TABLE IV  
SUMMARY OF RESEARCH MODEL

R	R <sup>2</sup>	Adjusted R <sup>2</sup>	Standard error of the estimate
0.825 <sup>a</sup>	0.681	0.669	0.39730

<sup>a</sup>Predictors: (Constant), internal control systems, decision-making tools and techniques, and financial accounting information

TABLE V  
HYPOTHESES RESULTS

Model	Unstandardized coefficients		Standardized coefficients	t	Significance
	B	Standard error	Beta		
ICS	0.382	0.130	0.381	2.939	0.000
DMTT	0.431	0.111	0.471	3.799	0.000
FAI	0.469	0.125	0.487	3.986	0.000

DV: BMD: Business management decisions, ICS: Internal control systems, DMTT: Decision-making tools and techniques, FAI: Financial accounting information

still meaningful effect, reflected by a beta of 0.381 and a  $t = 2.939$ . The unstandardized coefficients (B) indicate the raw effect sizes of each predictor, and the standardized coefficients (Beta) allow comparison of the relative importance of each variable in the model.

Overall, the results suggest that all three factors significantly contribute to improving business management decisions, with financial accounting information having the

greatest impact, emphasizing the importance of accurate financial data in effective managerial decision-making.

### B. Discussion

The findings of this study support Hypothesis 1, confirming that internal control systems (ICS) have a significant positive effect on Business Management Decisions in private banks in Erbil. Robust internal controls enhance the quality, consistency, and reliability of managerial decisions. This result is consistent with prior research by Manginte (2024) and Musyoki (2023), who found that effective internal control mechanisms contribute significantly to better risk management and operational decision-making in financial institutions. Similarly, Ajala et al., 2023 emphasizes the strategic value of internal controls in supporting informed decision-making and ensuring organizational objectives are met. In the context of private banks in Erbil, this finding underscores the importance of developing well-structured control systems to guide managerial actions and safeguard financial integrity. The alignment of this study with existing literature strengthens the argument that internal control systems are not only a compliance necessity but also a critical element of accounting-based DSSs that drive effective business management.

The results of this study provide strong support for Hypothesis 2, indicating that decision-making tools and techniques (DMTT) have a significant positive effect on Business Management Decisions in private banks in Erbil. It demonstrates a substantial influence, suggesting that the use of structured tools such as budgeting, forecasting, sensitivity analysis, and financial modeling enhances the quality and accuracy of managerial decision-making. These findings are consistent with previous research by Chowdhury et al. (2024), which emphasized that decision-support tools improve

strategic planning and performance monitoring in financial institutions. Likewise, Al-Okaily et al. (2023) highlighted that the application of analytical techniques contributes to more rational and evidence-based decisions. In the context of this study, the positive effect of DMTT highlights the growing reliance of private banks on data-driven processes and systematic approaches to make informed decisions in a competitive environment. These results affirm the crucial role of decision-making tools as core components of accounting-based DSS.

The findings of the study strongly support Hypothesis 3, confirming that the use of Financial Accounting Information has a significant positive effect on Business Management Decisions in private banks in Erbil. It represents the strongest impact among the three predictors, highlighting the critical role of financial data in managerial decision-making. This result aligns with previous studies such as Latifah et al. (2021) and Jami et al. (2023), who emphasized that reliable financial information enhances managers' ability to plan, control, and evaluate business operations effectively. Similarly, Basiru et al. (2023) found that decision-makers who utilize accurate and timely financial data are more likely to make sound strategic and operational choices. In the banking sector where financial performance, compliance, and risk assessment are paramount, access to detailed accounting information allows managers to evaluate alternatives, forecast outcomes, and ensure accountability. The findings of this research affirm the vital role of financial accounting as a foundational element in accounting-based DSS, particularly in the context of dynamic and competitive environments like private banking in Erbil.

## V. PRACTICES IMPLICATIONS, LIMITATIONS, AND FUTURE RESEARCH

### A. The Implications of Administrative Practices

The implications for managers of the private banks in Erbil-Kurdistan Region-Iraq are vital for this study. The finding of the significant effect of internal control systems, tools, and techniques of decision-making and financial accounting information on management decision-making indicates that managers at the bank level should give more attention to the development and integration of such influences in their strategic and operational projects. Developing internal control systems will lead to transparency, risk reduction, and responsibility. At the same time, using state-of-the-art decision support tools (like financial modeling tools, scenario analysis, and performance dashboards), you can enhance the overall quality, speed, and consistency of decision-making across the management team. Moreover, accurate, up-to-date, and readily available financial accounting information will help managers to take data-driven decisions consistent with the objectives set by the organization. These are, together, measures that should enable a more knowledgeable, effective, and strategic governance process in the long run, improving the competitiveness and performance across the board in the private banking sector in the region.

### B. Limitations and Future Research

Although this research presents valuable information about the positive effect of the internal control system, decision-making tools and techniques, and financial accounting information on business management decisions in the four private banks in Erbil, Kurdistan Region-Iraq, it has some limitations. First, the study is geographically bound to Erbil, and, therefore, may limit the transferability of the results to other geographical areas or sectors. Second, the study uses bank managers' self-reported data, and bias or over-reporting of the efficacy of these systems may be a limitation. Third, the cross-sectional study only indicates the relationships at one point in time and may not consider the changes over time or the causality.

Longitudinal research would be useful for examining the extent to which these facets impact managerial actions across time and assessment of these variables. Extending the analysis to other cities and regions in Iraq or public versus private banks could help increase the external validity of our results. Furthermore, for future investigation, one can consider investigating the moderating role of organizational culture, technology adoption, and regulatory environment, in the relationship between accounting-based DSS and managerial performance. This type of analysis would provide a richer picture of the factors that facilitate decision-making groups in banks.

## VI. CONCLUSION

This study concludes that accounting-based decision support systems, through strong internal control mechanisms, effective decision-making tools, and reliable financial accounting information, play a crucial role in enhancing business management decisions in private banks in Erbil. The significant positive impact of these components underscores their strategic value in improving managerial efficiency, strengthening governance, and supporting sustainable growth in the banking sector. These findings provide both theoretical contributions to the literature on decision support systems and practical guidance for financial institutions seeking to optimize their management practices.

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