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SEEKING CLOUD ACCOUNTING'S EVOLUTIONARY EFFECTS ON FINANCIAL ECOSYSTEMS

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Abstract:

This article aimed at evaluating the effect of cloud accounting on financial ecosystems.it discusses the relation between the usage of cloud accounting and work efficiency as well as cost savings. Moreover, the study aimed at determining the effect of cloud accounting on data-driven decision making capabilities in financial ecosystems. A correlational descriptive approach was applied, and the study sample was a purposeful sample and constituted of 150 participants (chief financial officers and accountants) from SMEs in Kurdistan Region in Iraq. A questionnaire was used as a research tool after checking for its validity and reliability. Results showed that cloud accounting had a positive effect on work efficiency and cost savings. Moreover, positive significant correlations were found between cloud accounting and data-driven decision making in SMEs. Based on these findings, implications are set for better adoption of cloud accounting and future studies on its effect on decision making in SMEs in Kurdistan Region.

Keywords:

Cloud Accounting, Work Efficiency, Financial Ecosystems

Introduction

Technological innovations have fundamentally transformed industries and organizations, compelling them to abandon traditional methods of operation. This transformation has been

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driven by the exponential increase in the speed and accessibility of data, fostering significant disruptions and changes across sectors. As a result, there is a growing demand for systems that can effectively accommodate these rapid changes. The financial industry, being a critical part of the global economy, is not immune to these technological shifts. Organizations in this sector are increasingly turning to digital technologies to meet the evolving demands of their stakeholders.

One significant response to these changes has been the rise of "financial ecosystems." These ecosystems refer to dynamic, interconnected networks that include various market participants such as banks, investors, regulators, and financial technology (FinTech) companies. These stakeholders collaborate and compete within these ecosystems to facilitate capital flow and ensure that resources are allocated to productive and sustainable projects (Palmie et al., 2020). As digital technologies continue to evolve, these ecosystems become essential in driving the efficient allocation of capital, fostering innovation, and enhancing the financial decision-making process (Boitan, 2021). In this context, organizations that embrace these technological shifts are better positioned to remain competitive.

In contrast, cloud accounting refers to the use of cloud-based platforms to manage financial information. This technological innovation has significantly enhanced the quality of financial reporting by improving accessibility, enabling real-time updates, and enhancing the accuracy of data (Alwan, 2022). With the reduction of physical infrastructure needs, cloud accounting also helps organizations optimize resource allocation and reduce costs, making it an attractive solution for businesses of all sizes (Mishra, 2024). Additionally, cloud accounting streamlines accounting processes by automating time-consuming tasks such as data entry and report generation, leading to greater operational efficiency.

The effects of cloud accounting are particularly evident in regions like the Kurdistan Region of Iraq, where financial systems have undergone significant modernization. Many banks and financial institutions in this region have embraced cloud accounting, leading to enhanced operational efficiency and better overall performance. For example, the introduction of cloud accounting technologies in Iraqi banks has improved both banking performance and cost management, as it allows for real-time data access and enhanced decision-making capabilities (Abbas, 2024). These developments have also contributed to greater financial transparency, which in turn has bolstered confidence in the region's banking sector and encouraged foreign investment.

However, the adoption of cloud accounting technology in developing markets like Kurdistan is not without its challenges. One of the most significant barriers to adoption is the lack of training and technical expertise among financial professionals. Many accountants and finance staff are unfamiliar with cloud-based systems, which can hinder their ability to fully leverage the benefits of these technologies (Hawez, 2022). Furthermore, concerns about data security remain prevalent, as businesses must ensure that their financial information stored in the cloud is protected from cyber threats. Data breaches, unauthorized access, and other security risks could undermine trust in cloud accounting systems and slow their widespread adoption (Sullivan & Thomas, 2023).

The shift towards digital technologies in the financial sector is irreversible, and cloud accounting plays a crucial role in this transformation. As organizations strive to enhance operational efficiency, improve resource allocation, and make data-driven decisions, cloud

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accounting technology has become an essential tool in modern financial management. By offering real-time access to financial data, cloud accounting systems empower organizations to make better decisions, streamline their operations, and enhance their overall financial performance.

In conclusion, cloud accounting is a powerful tool that has significantly transformed financial operations across industries. As businesses continue to embrace digital solutions, cloud accounting will remain a critical component of their financial systems, driving efficiency, transparency, and improved decision-making. However, challenges such as data security concerns, training gaps, and resistance to change must be addressed to ensure the successful implementation and widespread adoption of this technology. Through continued research and technological innovation, cloud accounting holds the potential to revolutionize financial management and contribute to the development of robust financial ecosystems around the world.

Literature Review

The advent of cloud computing has dramatically reshaped various industries, including the financial and accounting sectors, resulting in both operational and strategic transformations. One of the most noteworthy innovations in this space is the introduction of cloud accounting, which has significantly altered how businesses approach accounting practices, financial management, and decision-making processes. This literature review explores the impact of cloud accounting on financial ecosystems, focusing on work efficiency, cost savings, and data-driven decision-making (DDDM).

Cloud Accounting, Work Efficiency, and Cost Savings

Cloud accounting refers to a model of network computing where applications or software run on connected servers rather than local devices, making it accessible over the internet. This model eliminates the need for businesses to invest in expensive hardware, dedicated servers, and software infrastructure, leading to cost reductions and improved efficiency in financial operations (Akai et al., 2023). The growing adoption of cloud accounting has prompted various studies exploring its benefits, particularly in terms of cost savings and enhanced work efficiency. The scalability, flexibility, and real-time access to financial data make cloud accounting an attractive solution for organizations of all sizes, but particularly for small and medium-sized enterprises (SMEs), which often face resource constraints (Kmaleh, 2023).

The use of cloud-based solutions also leads to better collaboration within financial teams. In a traditional accounting setup, data is often siloed across different departments or locations, making it difficult for team members to collaborate effectively. Cloud accounting systems provide a centralized platform for storing financial data, allowing users to access and update information in real time, regardless of their location (Hung et al., 2022). This level of accessibility fosters a more collaborative working environment, enabling decision-makers to make timely, data-driven decisions and facilitating a more responsive organizational culture.

As businesses move towards digital solutions, cloud accounting has emerged as a crucial tool in reducing the total cost of ownership for financial management systems. With its ability to lower capital expenditures, minimize IT costs, and streamline accounting processes, cloud accounting contributes to enhanced financial performance and long-term

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sustainability. The growing adoption of cloud accounting across industries highlights its potential to drive cost efficiency and improve financial management practices.

Based on the previous discussion, the following hypothesis is proposed:
H1: The broad use of cloud accounting technology positively correlates with higher work efficiency and cost savings within entities using financial ecosystems.

Cloud Accounting and Data-Driven Decision Making (DDDM)
Data-driven decision-making (DDDM) refers to the practice of making decisions based on data analysis and evidence rather than intuition or personal experience. In recent years, data has emerged as one of the most valuable assets for businesses, enabling organizations to make more informed, accurate, and timely decisions. As data has become more accessible and actionable, the importance of DDDM has grown across industries, including the financial sector (Zilka et al., 2024).

However, the effective implementation of DDDM is not without challenges. To achieve meaningful results, organizations must ensure the quality and accuracy of the data they rely on for decision-making. Poor-quality data, such as incomplete, inconsistent, or outdated information, can lead to incorrect conclusions and suboptimal decisions (Kolsani, 2023). Moreover, the success of DDDM depends on the availability of skilled professionals who can analyze and interpret data effectively. Data analytics tools and techniques are complex, and businesses must invest in training their workforce or hiring qualified experts to fully capitalize on the potential of DDDM.

Despite these challenges, studies have consistently shown that cloud accounting contributes to improved decision-making capabilities. According to Alnaimat et al. (2024), cloud technologies enable organizations to make better decisions by providing real-time data access, improving transparency, and fostering collaboration among stakeholders. These features enhance the flexibility and responsiveness of decision-making processes, as information is processed and made available in real time, enabling decision-makers to act swiftly when needed.

The ability of cloud accounting systems to provide timely, accurate, and actionable data has made them a valuable tool in supporting data-driven decision-making. Organizations that adopt cloud accounting technologies gain a competitive edge by improving their decision-making processes, optimizing resource allocation, and enhancing financial performance.

Based on the preceding discussion, the following hypothesis is proposed:
H2: The adoption of cloud accounting methods improves data-driven decision-making capabilities within financial ecosystems.

Empirical Review of Related Studies on Cloud Accounting
Cloud accounting, a rapidly emerging technology that allows businesses to manage their financial data over the internet via cloud services, has significantly impacted the way financial institutions and firms operate. It offers numerous advantages, such as reducing infrastructure costs, enhancing scalability, and improving the accessibility and security of financial data. This section provides an in-depth review of various empirical studies conducted on the adoption and impact of cloud accounting, with a particular focus on its benefits in terms of efficiency, cost savings, decision-making, and reporting quality.

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Abdulrahman (2024): Cloud Accounting and Financial Reporting in Iraq

Abdulrahman (2024) examined the characteristics and effects of cloud accounting models on the financial reporting processes in Iraq. The research focused on understanding the adoption of cloud accounting within the Iraqi financial ecosystem, highlighting its impact on the quality of financial statements. Data for the study was gathered from a sample of 52 academic auditors and accountants through a tailored questionnaire. The results revealed that cloud accounting enabled businesses to reduce costs and improve performance by simplifying complex accounting processes, thus enhancing decision-making capabilities. However, several barriers to the full implementation of cloud accounting were identified, including lack of trust in cloud services and insufficient digital skills among the accounting workforce in Iraq. The study underscored the necessity of addressing these challenges through education and training programs for accountants to maximize the efficiency and quality of financial reporting.

Abdulrahman (2024) noted that cloud accounting technology has the potential to revolutionize financial management in Iraq, making it a critical area for future development. Nevertheless, it also highlighted the importance of trust-building measures and the development of local technological skills to ensure a smooth transition and integration of cloud accounting systems in the country.

Abbas (2024): Cloud Computing and Financial Accounting in Iraqi Banks

In a study focused on Iraqi banks, Abbas (2024) explored the impact of cloud computing on financial accounting systems. A questionnaire survey was conducted involving 112 employees from various commercial banks in Iraq. The research found that the adoption of cloud computing improved the scalability and adaptability of the banks' financial information infrastructure. The system allowed for the storage and processing of large datasets, which were critical for efficient financial operations, particularly in risk management and fraud detection.

Hawez (2022): Obstacles to Cloud Accounting Adoption in Kurdistan

Hawez (2022) conducted a study to investigate the obstacles hindering the adoption of cloud accounting in the Kurdistan region of Iraq. Data was collected through a questionnaire survey administered to 65 accountants and academics. The study found that one of the primary barriers to cloud accounting adoption in Kurdistan was the lack of awareness and knowledge among accountants about the technology. Many accountants in the region did not fully understand the potential benefits of cloud accounting, which impeded its widespread adoption.

Other significant barriers identified in the study included concerns about data security and privacy, the absence of local language support for cloud accounting platforms, and the lack of relevant training programs for accountants. The study emphasized that local language support and increased access to training programs were critical for overcoming these barriers and facilitating the adoption of cloud accounting systems in the region. Hawez (2022) concluded that greater collaboration between the government, academic institutions, and businesses is needed to promote the adoption of cloud accounting and ensure the development of a skilled workforce capable of managing these technologies.

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The study also highlighted that cloud computing served as a moderating variable, enhancing the relationship between MAI and decision-making. This research concluded that SMEs could greatly benefit from adopting cloud computing, as it provided a more efficient and cost-effective way to manage financial data and make informed business decisions. The authors recommended that SMEs focus on integrating cloud computing into their business processes to enhance their overall decision-making capabilities and improve their competitiveness in the market.

Ahmed (2020): The Benefits of Cloud Accounting in Kurdistan
Ahmed (2020) focused on the benefits and challenges of adopting cloud accounting in the Kurdistan Region. The study emphasized the cost-saving advantages of cloud accounting, particularly for businesses looking to reduce their reliance on expensive on-premise infrastructure. The research found that cloud accounting could significantly reduce IT costs, including the expenses associated with maintaining hardware and software systems.

The study also pointed out that cloud accounting offered greater collaboration among businesses, as it enabled real-time access to financial data from multiple locations. However, Ahmed (2020) also discussed the security risks associated with cloud accounting, including the potential for data breaches and unauthorized access to sensitive financial information. To mitigate these risks, the study recommended that businesses adopt robust security measures, such as encryption and multi-factor authentication, and ensure compliance with data protection regulations.

Akai et al. (2019): Cloud Accounting and Financial Reporting Quality in Nigerian Banks
Akai et al. (2019) conducted a study on the impact of cloud accounting on the quality of financial reports in Nigerian banks. The study focused on the use of Software as a Service (SaaS) and Infrastructure as a Service (IaaS) models. A questionnaire was distributed to 212 respondents from ten banks in Akwa Ibom State. The results showed that IaaS had a more significant effect on the quality of financial reporting compared to SaaS. The study concluded that cloud computing, particularly through IaaS, had a positive impact on financial reporting quality by enabling more accurate and timely financial statements.

Andronie and Ionescu (2019): Cloud Accounting and Financial Reporting
Andronie and Ionescu (2019) examined the role of cloud accounting in improving the quality of financial reporting. The study involved a survey of 100 participants, including managers, accountants, and financial experts from both private and public corporations. The findings indicated that cloud accounting helped enhance the quality of financial reporting by providing accurate and comprehensive datasets and enabling real-time access to financial data. The researchers concluded that cloud accounting systems offered significant benefits, such as unlimited data storage, backup capabilities, and real-time reporting, which improved the decision-making processes and financial performance of organizations.

Kariyawasam (2019): Cloud Accounting and Business Performance in Sri Lankan SMEs
Kariyawasam (2019) explored the impact of cloud accounting on the business performance of SMEs in Sri Lanka. The study focused on how cloud accounting affected intellectual capital, particularly relationship capital and human capital, and its subsequent effect on business performance. The findings revealed a strong positive relationship between cloud accounting and business performance, as well as a positive impact on intellectual capital.

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The research suggested that SMEs could enhance their overall performance by adopting cloud accounting and leveraging the insights it provided for decision-making.

In conclusion, most of the studies highlighted the importance of adopting cloud accounting, and its positive effect in the world of finance. It had a positive relation with different aspects of the work environment, such as performance, costs, efficiency; decision making … Therefore, supported by the previous literature, the current research continues to investigate the effect of cloud accounting on financial ecosystems.

Methodology

Small And Medium Enterprises (SMEs) in Kurdistan- Iraq

Small and medium enterprises (SMEs) can have a great impact in the economic development of a nation help foster innovation. Iraqi SMEs are considered to cover around 99 % of total companies in the country, distributed among different sectors such as wood and wooden goods, textiles, food and beverages, metals and metallic goods (Nather et al., 2020).

Kurdistan region is rich in natural resources like water and agricultural areas, and mainly gas and oil, which makes it depending on the petroleum industry. In year 2016, 80 % of the revenue generation was from this industry, thus not leaving much for other sectors. Still, SMEs have significant effect on boosting the economy of Kurdistan through employment of both natural and human resources and creating job opportunities, which requires support from the government to focus more on other sectors (Ali, 2019). In the same context, research showed that in 2015, SMEs in Kurdistan Region have provided 78.34 % of the job creation and could also positively affect the economic development and success (Shehab et al., 2017). Moreover, Mohammed and Jalal (2022) conducted their study on SMEs in Kurdistan as few studies discussed the factors that affected the implementation of innovative accounting systems in such enterprises, raising the importance of such issues especially for SMEs.

Sample and Population

The population of the study includes all accountants and C.F.Os (Chief financial officers) in SMEs in Kurdistan Region.

However, and after contacting one of the officials responsible of registration of SMEs in Kurdistan Region the number of the registered SMEs in the region is more than 37,000, and many SMEs are not registered. As result, and due to the great number of SMEs, surveys were sent to 250 SMEs to gather data from accountants and C.F.Os working in them. 185 responses were retrieved and 150 suitable responses were taken and analyzed.

Method

This study aims at investigating the effect of cloud accounting on financial ecosystems in SMEs in Kurdistan Region in Iraq. Research design followed in the current study is correlational descriptive, applying the quantitative method, which is suitable for fulfilling its objectives. A questionnaire for gathering data was sent to the participants and analyzed to get the results.

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Data Collection

The researcher depended on several related studies mainly Hung et al. (2022) to build a Likert-scale survey, aimed at evaluated respondents' views on cloud accounting and its effect on costs and work efficiency, as well as decision-making. The survey was formed of 2 components: cloud accounting containing 13 items covering work-efficiency and cost saving, and data-driven decision-making (DDDM) measuring the effect of cloud accounting on it containing 12 items. Respondents would choose from five answers for each item of the survey: 1= strongly disagree, 2= disagree, 3= neutral, 4= agree, and 5= strongly agree. The scoring range for responses according to this scale is evaluated as following:

Table 1: Scoring Range According To 5-Point Likert Scale

Response	Value	Range
Strongly disagree	1	1-1.8
Disagree	2	1.81-2.6
Neutral	3	2.61-3.4
Agree	4	3.41-4.2
Strongly agree	5	4.21-5

Psychometric Characteristics Of The Survey

A survey is fit to be used as a research tool for collecting data after checking fotr the level of reliability and validity of the results obtained using it. There are several statistical methods that could be used to assess reliability and validity among which are most frequently used are Cronbach alpha and Pearson correlation.

Cronbach alpha evaluates internal consistency showing the relation between items as a group, and ranges between 0 and 1 where in a study using Likert scale, good internal consistency is indicated by values higher than 0.75 (Izah et al., 2023). As for Pearson correlation, it evaluates the direction of the relation between two variables and the strength of this relation where values need to be closet to 1 or -1, which allows determining the validity of a research tool (Schober et al., 2018).

In order to check for validity and reliability of the survey used in this study, a sample of 52 surveys was distributed randomly among SMEs in Kurdistan Region, and data was gathered to test for reliability using Cronbach Alfa, while validity was tested using Pearson correlation, after taking the experts' judgement on the content of the questionnaire. Results are shown in the following tables:

Table 2: Results of Cronbach's Alpha test

Cronbach's Alpha	N of Items
.961	25

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Cronbach's Alpha test was applied and results in the above table shows 0.961 for 25 items, which indicates high reliability for the survey administered.

Table 3: Results Of Pearson's Correlation Test Of Cloud Accounting

Correlations

		c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12
c2	Pearson Correlation	.571**	1										
	Sig. (2-tailed)	.000											
	N	52	52										
c3	Pearson Correlation	.301*	.620**	1									
	Sig. (2-tailed)	.030	.000										
	N	52	52	52									
c4	Pearson Correlation	.279*	.518**	.506**	1								
	Sig. (2-tailed)	.045	.000	.000									
	N	52	52	52	52								
c5	Pearson Correlation	.360**	.574**	.465**	.496**	1							
	Sig. (2-tailed)	.009	.000	.001	.000								
	N	52	52	52	52	52							
c6	Pearson Correlation	.316*	.465**	.325*	.451**	.284*	1						
	Sig. (2-tailed)	.023	.001	.019	.001	.042							
	N	52	52	52	52	52	52						
c7	Pearson Correlation	.289*	.508**	.470**	.294*	.477**	.569**	1					
	Sig. (2-tailed)	.037	.000	.000	.035	.000	.000						
	N	52	52	52	52	52	52	52					
c8	Pearson Correlation	.503**	.499**	.560**	.394**	.296*	.405**	.574**	1				
	Sig. (2-tailed)	.000	.000	.000	.004	.033	.003	.000					
	N	52	52	52	52	52	52	52	52				
c9	Pearson Correlation	.464**	.586**	.453**	.381**	.489**	.642**	.558**	.630**	1			
	Sig. (2-tailed)	.001	.000	.001	.005	.000	.000	.000	.000				
	N	52	52	52	52	52	52	52	52	52			
c10	Pearson Correlation	.334*	.428**	.402**	.380**	.245	.618**	.526**	.664**	.644**	1		
	Sig. (2-tailed)	.016	.002	.003	.006	.080	.000	.000	.000	.000			
	N	52	52	52	52	52	52	52	52	52	52		
c11	Pearson Correlation	.347*	.330*	.321*	.470**	.435**	.491**	.464**	.476**	.552**	.661**	1	
	Sig. (2-tailed)	.012	.017	.020	.000	.001	.000	.001	.000	.000	.000		
	N	52	52	52	52	52	52	52	52	52	52	52	
c12	Pearson Correlation	.418**	.495**	.499**	.578**	.583**	.408**	.269	.377**	.521**	.491**	.557**	1
	Sig. (2-tailed)	.002	.000	.000	.000	.000	.003	.054	.006	.000	.000	.000	
	N	52	52	52	52	52	52	52	52	52	52	52	52
c13	Pearson Correlation	.566**	.505**	.332*	.482**	.428**	.649**	.531**	.541**	.504**	.543**	.607**	.454**
	Sig. (2-tailed)	.000	.000	.016	.000	.002	.000	.000	.000	.000	.000	.000	.001
	N	52	52	52	52	52	52	52	52	52	52	52	52

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**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Table 3 shows Pearson correlation coefficients between the items corresponding to cloud accounting pairwise.

The table shows Pearson correlation coefficients between pairs of variables (c1 through c13) based on a sample size of 52. Results showed different correlations from weak to strong and significance varied between level 0.01 (such as c1- c2, and c2-c8) which indicates a strong relation, and 0.05 (such as c3- c4 and c6- c7) which indicates a moderate relation. Reading results of the table, c9 shows strong correlations with several variables such as c6 and c8, c13 also shows strong correlations with variables such as c2 and c6. Moreover, c5 showed moderate to weak correlation with c10, and c7 showed moderate correlation with c10 and c5. C11 and c12 showed strong correlations with each other and with c9, as well as c3 and c5 showed moderate to strong correlations with each other and with other variables such as c4 and c6.

Table 4: Results Of Pearson' Test For Validity Of DDDM Component At Significance

		d1	d2	d3	d4	d5	d6	d7	d8	d9	d10	d11	d12
d2	Pearson Correlation	.734**	1										
	Sig. (2-tailed)	.000											
	N	52	52										
d3	Pearson Correlation	.802**	.620**										
	Sig. (2-tailed)	.000	.000										
	N	52	52										
d4	Pearson Correlation	.633**	.448**	.741**									
	Sig. (2-tailed)	.000	.001	.000									
	N	52	52	52									
d5	Pearson Correlation	.709**	.604**	.667**	.655**								
	Sig. (2-tailed)	.000	.000	.000	.000								
	N	52	52	52	52								
d6	Pearson Correlation	.803**	.607**	.721**	.628**	.764**							
	Sig. (2-tailed)	.000	.000	.000	.000	.000							
	N	52	52	52	52	52							
d7	Pearson Correlation	.755**	.581**	.597**	.625**	.662**	.802**						
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000						
	N	52	52	52	52	52	52						
d8	Pearson Correlation	.584**	.510**	.517**	.600**	.578**	.615**	.548**					
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000					
	N	52	52	52	52	52	52	52					
d9	Pearson Correlation	.441**	.298*	.547**	.670**	.411**	.599**	.609**	.663**				
	Sig. (2-tailed)	.001	.032	.000	.000	.002	.000	.000	.000				
	N	52	52	52	52	52	52	52	52				
d10	Pearson Correlation	.531**	.395**	.547**	.804**	.535**	.571**	.643**	.577**	.645**			
	Sig. (2-tailed)	.000	.004	.000	.000	.000	.000	.000	.000	.000			

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	N	52	52	52	52	52	52	52	52	52			
d11	Pearson Correlation	.596**	.429**	.502**	.715**	.560**	.559**	.721**	.636**	.633**	.704**		
	Sig. (2-tailed)	.000	.002	.000	.000	.000	.000	.000	.000	.000	.000		
	N	52	52	52	52	52	52	52	52	52	52		
d12	Pearson Correlation	.608**	.503**	.712**	.808**	.516**	.518**	.502**	.574**	.678**	.551**	.649**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	
	N	52	52	52	52	52	52	52	52	52	52	52	52

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Table 4 shows Pearson correlation coefficients are represented between items of data-driven decision making, which are 12 items from d1 through d12.

All correlations shown are positive, indicating that a one variable increases the other increases. Moreover, all correlations are statistically significant at 0.01, which indicates a low probability of correlations to be caused by chance.

In general, strong correlations appear between variables, such as d12 which shows high correlations with all other variables, and d2 shows moderate to high correlations with the rest. Additionally, d6 shows strong correlation with d3 (0.721), d4 (0.628), d5 (0.764), and d7 (0.802), while d9 shows moderate correlation with d2 (0.441), and higher with d5 (0.670) and d11 (0.721). Finally, d2 shows a positive but weak correlation with d9 (0.298).

In general, Pearson correlations show positive relations between items of same components, which suggest high validity of the questionnaire for components cloud accounting and data-driven decision-making.

In conclusion, the survey showed to have high levels of reliability and validity, thus making the survey a scientific research tool that can be applied in the Kurdistan Region.

Data Analysis

Table 5: Demographic Characteristics Of The Sample

Gender			
		Frequency	Percentage
Valid	Male	85	56.7
	Female	65	43.3
	Total	150	100.0
Age			
Valid	25-30	18	12.0
	31-35	20	13.3
	36-40	54	36.0
	41-45	38	25.3
	46 and above	20	13.3
	Total	150	100.0
Education Level			
Valid	Bachelor	30	20.0
	Graduate	120	80.0
	Total	150	100.0
		Position	

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Valid	Accountant	88	58.7
	Chief financial officer	62	41.3
	Total	150	
Expertise			
Valid	1-3	20	13.3
	4-9	30	20.0
	10-12	32	21.3
	13 and more	68	45.3
	Total	150	100.0

Table 5 shows the demographic distribution of the sample of the study covering the following characteristics: gender, age, education level, and years of expertise. Results show that 56.7 % of the respondents are males, while 43.3 % of them are females, which refers to a balance in the distribution between males and females. Around 75 % of respondents are above 36 years old, with highest percentage for the age group 36-40 (36 %) and lowest percentage for the age group 25-30 (12 %). The educational level of the sample showed high percentage for graduates (80 %) leaving 20 % holding a bachelor degree. Aligning with the results of the level of education as well as the age group, results showed that 45.3 % of the sample had more than 13 years of experience which is a percentage that validates their opinions and allows them to have credible judgements unbiased due to their high experience in the financial sector.

Moreover, the respondents are distributed almost evenly between accountants (58.7 %) and chief financial officers (41.3 %), which allow gathering data from professionals with high level of expertise and education in the financial world.

Table 6: Descriptive Data Of Cloud Accounting

No.	Item	Mean	Std. Dev.	Interpretation
c10	cloud accounting ensures financial reports are submitted within specific timelines	4.36	.7353	Strongly agree
c1	cloud accounting enhances the efficiency of financial reporting	4.33	.6075	Strongly agree
c6	cloud accounting transition is user-friendly	4.32	.8695	Strongly agree
c9	cloud accounting usage decreases the necessity of physical infrastructure	4.31	.6769	Strongly agree
c3	cloud accounting helps facilitate real-time financial monitoring	4.27	.7849	Strongly agree
c8	cloud accounting systems are characterized by higher scalability compared to traditional accounting systems	4.25	.7852	Strongly agree
c12	cloud accounting ensures better integration with other business applications	4.25	.8587	Strongly agree
c2	cloud accounting decreases the margin of financial errors	4.23	.7181	Strongly agree

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c11	cloud accounting contributes to the transparency of the financial actions in general	4.21	.8792	Strongly agree
c4	cloud accounting implementation saves costs	4.19	.7453	Agree
c5	cloud accounting usage improves data security during financial transactions	4.13	.9504	Agree
c7	cloud accounting enhances team collaboration	4.13	.8846	Agree
c13	cloud accounting has a positive effect on financial ecosystems of my organization in general	4.06	.8688	Agree
C ACC		4.23	.5625	Agree

Analyzing responses from the study sample are shown in table 6, presenting descriptive data including the mean and standard deviation of each item covering component "cloud accounting". Items are presented in descending order according the mean obtained which helps better understanding the views of the sample on cloud accounting. The mean of this component is 4.23 with standard deviation 0.5625, which represent "agree", showing that all views of the sample ranged around "agree". Item c10 "cloud accounting ensures financial reports are submitted within specific timelines" scored the highest average mean (4.36) with standard deviation 0.753, representing "strongly agree" which ensures that using cloud accounting has a positive effect on meeting deadlines for financial reporting and leads to enhanced trust in the performance of the organization.

Notice that most of the items had means interpreted for the response "strongly agree". Items c1, c6, c9, c3, c8, c12, c2, and c11 all had means that showed "strongly agree" as viewed by the sample of the study, which refer to many benefits of implementing cloud accounting to execute financial operations. Interpreting the obtained results, cloud accounting allows fewer errors, saving costs and time needed with higher scalability and better collaboration in the workspace.

Item c13 "cloud accounting has a positive effect on financial ecosystems of my organization in general" scored the lowest mean (4.06) and could be attributed to the generality of item as it doesn't address a specific feature of cloud accounting or any of its effects.

Table 7: Descriptive Data Of DDDM:

No.	Item	Mean	Std. Dev.	Interpretation
d10	data-driven information is used by executives for decision making	4.41	.6366	Strongly agree
d9	data-driven information is used by managers for decision making	4.39	.6833	Strongly agree
d12	cloud accounting usage enhances decision-making skills within the organization	4.34	.7031	Strongly agree

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d11	data-driven information is used to predict future behavior and trends	4.33	.6822	Strongly agree
d4	cloud-based information ensures dependability on decisions made by the organization	4.32	.8460	Strongly agree
d2	cloud-based information ensures accuracy in decisions made by the organization	4.23	.8702	Strongly agree
d8	cloud-based data is considered a revenue generator	4.20	.8027	Agree
d6	cloud-based information is considered a highly valued-asset	4.20	.8670	Agree
d1	cloud-based information ensures minimum errors in decisions made by the organization	4.18	.8980	Agree
d5	cloud accounting usage enhances decision-making processes in financial management	4.17	.9030	Agree
d3	cloud-based information ensures precision in decisions made by the organization	4.13	1.0661	Agree
d7	cloud-based information is used to identify new business opportunities	4.06	.9914	Agree
DDDM		4.25	.6657	Strongly agree

Table 7 presents the descriptive results of all items of DDDM (data-driven decision making) component and the average mean of it, showing it to be 4.25, which is interpreted by the response "agree". Scores ranged between 4.41 for item d10 "data-driven information is used by executives for decision making", as highest score, to reach item d7 "cloud-based information is used to identify new business opportunities". Most of the items had the response "strongly agree" (d9, d12, d11, d4, d2) and approach this value also (d8, d6) showing that managers and executives depend on data driven information to make decisions and use cloud accounting to employ dependable information and data for future behavior and trends. The study sample also responded by "agree" for the rest of the items ensuring high importance of cloud accounting in decision making processes.

According to the views of the study sample, cloud-based data was considered to be a revenue generator and highly valued asset as the results from items d8 and d6 revealed (mean 4.2 for both items), also decisions made using cloud-based information are considered of precise and with minimum errors. Responses also showed that this type of information could help identify new business opportunities, an important aspect for companies to survive and gain competitive advantage promoting innovativeness and adopting advanced technologies.

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Table 8: Pearson Correlations Between Cloud Accounting And DDDM

Correlations			
		DDDM	C_ACC
DDDM	Pearson Correlation	1	.902**
	Sig. (2-tailed)		.000
	N	150	150
**. Correlation is significant at the 0.01 level (2-tailed).			

Table 8 shows correlation coefficient between the component covering cloud accounting and that of DDDM, which is 0.902, with statistical significance .000. This result shows the existence of a strong positive relationship, therefore, the chance of obtaining such correlation between these variables is less than 1 %, resulting in high positive correlation among the sample of 150 participants.

Table 9: Correlation Between Each Item Of Cloud Accounting And DDDM:

		d1	d2	d3	d4	d5	d6	d7	d8	d9	d10	d11	d12
c1	Pearson Correlation	.371**	.274**	.254**	.422**	.288**	.359**	.558**	.540**	.470**	.482**	.529**	.430**
	Sig. (2-tailed)	.000	.001	.002	.000	.000	.000	.000	.000	.000	.000	.000	.000
c2	Pearson Correlation	.465**	.417**	.511**	.495**	.331**	.420**	.612**	.489**	.553**	.580**	.676**	.453**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
c3	Pearson Correlation	.530**	.564**	.558**	.393**	.293**	.432**	.488**	.349**	.477**	.444**	.418**	.536**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
c4	Pearson Correlation	.531**	.657**	.577**	.352**	.530**	.565**	.457**	.521**	.437**	.346**	.484**	.493**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
c5	Pearson Correlation	.720**	.491**	.586**	.634**	.662**	.588**	.626**	.538**	.358**	.512**	.545**	.538**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
c6	Pearson Correlation	.459**	.504**	.576**	.462**	.408**	.467**	.382**	.542**	.400**	.341**	.339**	.480**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
c7	Pearson Correlation	.410**	.432**	.430**	.394**	.392**	.439**	.466**	.446**	.429**	.264**	.297**	.459**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.000	.000
c8	Pearson Correlation	.413**	.485**	.337**	.466**	.299**	.459**	.584**	.464**	.572**	.439**	.535**	.540**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
c9	Pearson Correlation	.558**	.411**	.602**	.597**	.547**	.602**	.582**	.539**	.578**	.507**	.426**	.564**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
c10	Pearson Correlation	.501**	.298**	.606**	.590**	.492**	.623**	.661**	.446**	.763**	.483**	.535**	.554**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
c11	Pearson Correlation	.631**	.513**	.571**	.593**	.765**	.701**	.663**	.510**	.554**	.537**	.552**	.490**

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	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
c12	Pearson Correlation	.682**	.542**	.660**	.593**	.602**	.691**	.574**	.561**	.454**	.549**	.512**	.572**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
c13	Pearson Correlation	.597**	.665**	.491**	.576**	.534**	.519**	.596**	.647**	.435**	.513**	.634**	.626**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

In table 9, the strength of the relation between cloud accounting and data-driven decision making was tested using Pearson correlation. Results show the direction and strength between each item from cloud accounting with each item of DDDM, revealing a positive relation among all pairs at 0.01. In general, most of the relations were moderate to strong; some pairs had weak relations but still positive.

Test of Hypothesis

H1: the broad use of cloud accounting technology positively correlates to higher working efficiency and cost savings within entities using financial ecosystem

According of results in table 5, and depending on participants' answers, cloud accounting ensures efficiency of financial reporting quality, submitting of reports in required deadlines with minimum margin of errors as well as costs. These results are concluded through high mean scores for the whole component of cloud accounting (4.23) and the range of these means for all items of cloud accounting was also higher than 4 (between 4.36 and 4.06). As for correlations, table 2 showed high correlations between items of cloud accounting which also ensures its positive impact on different aspects of the work environment. Thus showing the validation of the hypothesis one H1.

H2: the adoption of cloud accounting methods improves data-driven decision making capabilities within financial ecosystems.

Table 9 shows positive correlations between all items from component of cloud accounting with those of DDDM at level of significance 0.01. Some of these correlations were high showing strong relations such as between c5 and d1 (0.720), c12 and d1 (0.682), and c11 with d5 and d6. On the other hand, some items showed weak correlations such as c1-d3 (0.254) and c3-d5 (0.293), while others showed moderate correlations such as c1-d4 (0.422) and c9-d2 (0.411).

It can be noticed that c9, c12 and c13 has a moderate to strong correlation with all items of DDDM, similarly for c10 except for the relation between c10 and d2 which was positive but weaker than the rest (0.298).

In general, and referring to table 7, results showed positive high correlation between cloud accounting and data-driven decision making (0.902) with significance level 0.01.

Therefore, hypothesis 2 is validated, implying that the adoption of cloud accounting methods improves data-driven decision making capabilities within financial ecosystems.

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Findings and Discussion

Results from 150 SMEs has shown high level of agreement on the benefits of cloud accounting, where items c9, c6, c1, and c10 scored means higher than 4.3 in increasing order, and referring to the response "strongly agree" especially on the quality of timeliness, which agrees with Akai et al., (2023) who also showed that cloud accounting helps improving timeliness of financial reports. Results of this study also showed efficiency that cloud accounting can provide in submitting financial report, moreover, and it is perceived to be user-friendly and at the same time helps in decreasing the need of having physical infrastructure which can reduce in costs.

Looking at the rest of items, c3, c8, c12, c2, and c11 decreasingly scored a mean between 4.27 and 4.21, still in the range of "strongly agree", where these items correspond to helping in monitoring financial operations, and better scalability, transparency and integration with different applications, all that within a smaller margin of financial errors, aligning with the results form Abbas (2024) that showed a great benefit that includes detecting fraud and enhancing risk management in Iraqi banks. These results can ensure the importance of cloud accounting in improving financial activities and the accounting operations in general, which agrees with the study of Lafta (2022) that ensured that cloud accounting can enhance accounting as a profession, and Kariyawasam (2019), that showed a positive effect on performance in SMEs, which was the main environment focused on in this study. Additionally, Wahhab et al. (2024) revealed that cloud accounting could have positive effects on financial reporting quality in the Iraqi context.

However, the mean of c4 "cloud accounting implementation saves costs" had a mean of 4.19, and weak to moderate correlations with other items of cloud accounting, although it still has a high mean according to the views of the sample, which aligns with similar research implemented in Kurdistan showing the positive effect of cloud accounting on reducing costs as well as saving time (Ahmed, 2020), still the need to enhance the knowledge and usage of this technology to save costs is needed. Insufficient knowledge about cloud accounting could lead to low efficiency of the implementation of such a technology, being a significance obstacle which is emphasized by Hawez (2022) as a challenge in the Kurdish environment.

As for data-driven decision making, the average mean of 4.25 which corresponds to "strongly agree", where d10, which refers to taking decision by executives based on data-driven information, scored an average of 4.41, and item d9 that refers also to the usage of data-driven information by managers to make decisions, with a mean average of 4.39, also representing the response "strongly agree". Moreover, items d12, d11, and d4 all ranged between 4.34 and 4.32 decreasingly which also shows high agreement of participants views, referring to dependability of information that is data-driven, which can help predict future behavior and trends and improve decision-making skills within the organization. D7 shows lowest mean average (4.06) and refers to identify new business opportunities, which can be explained by other factors, not only data-driven information, such as thorough analysis of the institute's environment and well-awareness of competitors, customers' needs, and market changes. Such findings relate to previous literature that emphasized the effectiveness of employing data-driven information in decision making (Maelah et al., 2021; Hung et al., 2022).

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Looking at correlations, as shown in the tables above (table 8 and table 9), Pearson correlation coefficient has shown high correlations between cloud accounting and data-driven decision making, where all relations proved to be positive and with significance level of 0.01. These results align with the findings of Malelah et al. (2021) and Hung et al. (2022) which showed a positive effect of adopting cloud based accounting and a significant impact of digital transformation on both cloud-based accounting effectiveness and decision-making quality. Alnaimat et al. (2024) indicated comprehensive prospects for the employment of cloud computing in the accounting of the organization, especially for small and medium sized companies.

Conclusions

Adoption of cloud accounting as an emerging technology has had its various effects on different aspects of organizations. In SMEs of Kurdistan-Region, and as per the results reached by this study, general views of it has been positive, which indicates intentions toward using it and benefiting from its advantages. An important task on managers such as decision making, need reliable information and financial reports of high quality, therefore, cloud accounting can provide accurate and flawless information where accountants can execute operations and activities, relative to accounting in his SME. Hence, the researcher reassures the importance of providing necessary infrastructure for adoption of cloud accounting, high level training, and deal with security risks that might rise, on the other hand, positive acceptance of cloud accounting is essential for individuals in SMEs to use it, and be well aware of its importance and efficiency.

The findings of the study reassured the importance of an effective adoption of cloud accounting in SMEs, having a positive impact on competencies of DDDM. Cloud accounting was proven to enhance work efficiency and cost savings, as well as transparency and timeliness. As for data-driven decision-making, it can be concluded that such decisions, using cloud accounting, and is used by managers and executives in SMEs and can be of higher accuracy and precision, thus promoting the overall progress of financial reporting.

Future Implications

The current study showed a positive relation between cloud accounting and data-driven decision making, and also a positive effect between cloud accounting and achieving high levels of efficiency in the work environment of financial ecosystems, and cost savings within its entities. The scope of the study covered SMEs in Kurdistan Region; hence the researcher implies future studies in different regions of Iraq and on bigger samples, leading to better and more accurate results. Still, some aspects may be improved such as prompting DDDM as a positive factor for increasing revenue of the institute, which helps in turn to improve intentions toward depending on data- driven information and upscaling digital skills to use cloud accounting. Finally, studies to investigate the risks of using cloud accounting in SMEs can help determine negative aspects of cloud accounting, in order to provide better security measures and take financial decisions in favor of the institutions of Kurdistan Region.

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