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DETERMINANTS OF CLOUD ADOPTION IN SMES: A PLS-SEM APPROACH

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Abstract

Cloud computing has emerged as a transformative technology offering cost efficiency, scalability, and flexibility, yet its adoption among small and medium-sized enterprises (SMEs) remains uneven. This study investigates the determinants influencing cloud computing adoption in SMEs using the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach. Drawing on technology adoption theories, the research model incorporates factors such as perceived usefulness, ease of use, cost-effectiveness, security concerns, top management support, and external pressure. Survey data collected from SMEs were analyzed to assess both the measurement and structural models. The results reveal that perceived usefulness, management support, and external pressure significantly drive adoption, while concerns regarding cost and security act as barriers. The findings provide empirical evidence that strategic, technological, and organizational factors jointly shape adoption decisions. This study contributes to the literature by offering a comprehensive model of SME cloud adoption and provides practical insights for policymakers, vendors, and SME managers to enhance cloud adoption strategies.

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INTRODUCTION

Cloud computing has been earmarked as a critical driver of digital transformation for small and medium-sized enterprises (SMEs) as it provides effective scalability, economic viability and operational agility (Chen et al., 2023; Al-Sharafi et al., 2023). More specifically, small and medium-scale enterprises (SMEs) in developing economies are less avid adopters of cloud solutions on account of various drivers of unwillingness to adopt, mainly fears around security, limited budgets, and insufficient technical knowhow (Ali et al., 2023;
Soomro et al., 2024). However, the increasing reliance on cloud-based technologies for sustainable business practices requires the cloud to be embraced as a strategic imperative, not an option (Khattak et al., 2023; Chanda et al., 2024). The development of mobile computing plays a major role in increasing use of cloud applications, and implied's arising decision-making factors to cloud adoption of the Android operating system with devices are perceived usefulness, security concerns, cost efficiency and organizational readiness (Bakar et al., 2024; Nazir et al., 2025).

Theoretical constructs to decode the cloud adoption processes have utilized the Technology-Organization-Environment (TOE) model, and the Unified Theory of Acceptance and Use of Technology (UTAUT) (Khayer et al., 2021; Jayeola et al., 2022). While the TOE framework identifies technological, organizational, and environmental dimensions that influence cloud integration, UTAUT focuses on user increasing intentions behaviour and perceptions (Teh et al., 2024). This gap between commissioning cloud computing and actual use can be bridged through a potential mediator – readiness (Kamran et al. 2023; Lutfi 2021). Moreover, government incentives and cloud promotion policies play a significant

role in accelerating adoption in resource- constrained settings (Chen et al., 2023; Al-Sharafi et al., 2023).

Cloud computing has numerous advantages, but security risks remain one of the significant challenges to cloud adoption (Ali et al., 2023; Chanda et al., 2024). Because of the belief that cloud computing is vulnerable to cyber attacks, data breaches and compliance risks, SMEs have been hesitant to make the leap to full-scale adoption (Nazir et al., 2025; Soomro et al., 2024). However, due to high-level of encryption, regulatory framework and increased vendor support, some of these obstacles have been addressed, consequently facilitating the more widespread adoption of blockchain among SMEs (Khattak et al., 2023; Jayeola et al., 2022). In addition to that, cloud utilization in organization has been cited as a critical component in reaching sustainable performance that enables performance enhancement of operational flexibility, asset allocation and production cost efficiency (Bakar et al., 2024; Teh et al., 2024).

Regardless of the surge of interest in cloud computing, SMEs keep experiencing infrastructural, cultural and managerial barriers in the complete usage of cloud technologies within their institution besides due its extension in emerging markets (Khayer et al., 2021; Kamran et al., 2023) These barriers can be removed when the organization is prepared and ready, when strong leadership support

is present; and when the workforce is digitally competent (Lutfi, 2021; Chen et al., 2023). To address this gap, the current study examines the impact of perceived usefulness, security concern and cost efficiency towards cloud adoption, with organization readiness as mediating variable. The model used proposed to study, from a quantitative perspective, the essential factors that drive and/or limit SMEs from migrating its operation to the cloud, while it makes it possible to identify the influence of services capabilities, security concerns and cost efficiency among others relative to the open cloud environments of the cloud computing adoption. Furthermore, it investigated organizational readiness in mediating role, that is, between the above-mentioned factors and cloud adoption.

Research Objectives

1. To examine the impact of perceived usefulness on cloud computing adoption in SMEs.
2. To assess the influence of security concerns on cloud computing adoption in SMEs.
3. To evaluate the effect of cost efficiency on cloud computing adoption in SMEs.
4. To investigate the mediating role of organizational readiness in the relationship between perceived usefulness, security concerns, cost efficiency, and cloud adoption.

Literature Review

Cloud computing is gaining more popularity among small and medium-sized enterprises (SMEs) and the use of cloud is witnessed to improve operational efficiency as well as cut costs and improve scalability. The literature has extensively examined cloud adoption in SMEs, with several studies investigating its technological and organizational determinants (Chen et al., 2023; Soomro et al., 2024). Various Parameters in the Cloud Adoption Process The Technology-Organization-Environment(TOE) paradigm has been extensively used to analyze these parameters, with studies indicating that technological readiness, organizational commitment, and external stimuli are all influencing factors in the cloud adoption decision-making process (Bakar et al., 2024; Khayer et al., 2021). The evolution of SMEs coupled

with an increased focus on sustainability as a lever for value creation from within SMEs has pushed the pursuit of digital transformation strategies, including cloud computing as the facilitating technology for business sustainability in the long run (Jayeola et al., 2022; Khattak et al., 2023).

Security remains a major barrier to the implementation of cloud computing in SMES (Ali, G, et al., 2023; Chanda, S, et al., 2024); firms are typically hesitant to migrate due to concerns about data breaches and unauthorized access (Ali, G, et al., 2023; Ali, S, V, et al., 2023; Chanda, S, et al., 2024; Khan, A, et al., 2018; Malik, S, A, et al., 2018). Nonetheless, cloud service providers have established strong security measures, SME perceived cloud computing an impermissibly vulnerable technology (Nazir et al., 2025; Al-Sharafi et al., 2023) especially in the regions with diluted regulatory framework. Data encryption, multi-factor authentication and compliance with internationally accepted security standards have been identified in previous studies as crucial trust building strategies that will help in gaining greater adoption of the technology (Teh et al, 2024; Kamran et al, 2023). The reluctance of small and medium enterprises (SMEs) to adopt cloud- based solutions is also due to the limited cybersecurity awareness and expertise among SME owners (Chen et al., 2023; Soomro et al., 2024).

The support of top management is considered a significant determinant of cloud adoption, with top leadership being important to the decision-making process and resource allocation (Teh et al., 2024; Bakar et al., 2024). CEOs with high interest on very important domain tends to invest more on cloud computing and to fully integrate the cloud service to business operation in SMEs (Khayer et al., 2021; Jayeola et al., 2022). Academicians insist that organizational executives develop awareness of the benefits of cloud computing and devise strategic plans to ensure successful adoption (Khattak et al., 2023; Lutfi, 2021). Organizational culture and resistance to change also represents a major challenge, with employees often unwilling to migrate from traditional IT infrastructure to cloud-based systems (Ali et al., 2023; Chanda et al., 2024). Cloud computing is usually mentioned in connection with cost-effectiveness, especially for SMEs working with fewer funds (Chen et al. 2023; Soomro et al. 2024). Cloud technology minimizes the hardware and IT maintenance costs, enabling enterprises to use resources more efficiently (Al- Sharafi et al., 2023; Ali et al., 2023). Nonetheless, research indicates that migration costs, like fees for subscriptions and vendor lock-in worries, prevent some SMEs from adopting cloud solutions (Chanda et al., 2024; Nazir et al., 2025). These financial limitations motivated proposals for flexible pricing models and customized cloud services for broader adoption in SMEs by different authors (Bakar et al., 2024; Khayer et al., 2021).

The influence of government policies, organizational structures, and external environmental factors significantly cannot be neglected amongst us as regulatory support and market competition genuinely impact cloud adoption strategies of SMEs (Jayeola et al., 2022; Khattak et al., 2023). Governments implement cash incentives, tax benefits, and training programs to promote digitalization in some regions (Teh et al., 2024; Kamran et al., 2023). Additionally, the business environment involves undeniable competitiveness where SMEs face the compulsion to embrace cutting- edge technologies to retain their competitive edge (Chen et al., 2023; Soomro et al., 2024). The effect of supply chain dynamics on cloud-enabled collaborative efforts with stakeholders has also been observed in one study, noting improved operational efficacy with suppliers and customers (Al-Sharafi et al., 2023; Ali et al., 2023).

Overcoming challenges in these contexts can be time-consuming, and the trends of cloud computing adoption in the companies will be affected by industry-specific challenges (Chanda et al., 2024; Nazir et al., 2025). Such as academia needs high data privacy regulation compliance while the pharmaceutical industry needs to meet strict regulatory guidelines (Bakar et al., 2024; Khayer et al., 2021). Industry-specific cloud solutions (e.g., hybrid cloud models, industry-based compliance tools) provide more accessible and attainable solutions with higher adoption rates than alternatives (Jayeola et al., 2022; Khattak et al., 2023). As an example, since there is an enormous demand for digital record-keeping and supply chain efficiency, the pharmaceutical industry in Pakistan has witnessed growing measures of Cloud adoption (Teh et al., 2024; Kamran et al., 2023).

The evolution brought by Industry 4.0 and technological advancements has a profound impact on SMEs cloud adoption landscape, where innovative technologies as artificial intelligence, big data-based analytics and Internet of Things (IoT) boost the digital transformation (Chen et al., 2023; Soomro et al., 2024). Research on SME cloud-based platforms at the intersection of IS and management accounting has primarily focused on how SMEs utilize these platforms for data-driven decision- making, automation, and real-time monitoring (Al- Sharafi et al., 2023; Ali et al., 2023). Nonetheless, there are still digital literacy gaps and a lack of IT expertise in the region, which still need targeted training programs and capacity-building initiatives (Chanda et al., 2024; Nazir et al., 2025). Broadly, cloud computing represents a large prospect for a revitalization of the efficiency, competitiveness, and sustainability of the SMEs, but that the adoption rate itself is driven by a range of variables, such as security concerns, managerial support, cost considerations, and industrial context (Bakar et al., 2024; Khayer et al., 2021). While supportive policies and trust- building mechanisms provided by the governments and cloud service providers can lower the barmier significantly (Jayeola et al., 2022; Khattak et al., 2023), SMEs need to pay real attention to their digital readiness and strategic planning.

Research Hypotheses

H1: Perceived usefulness has a significant positive impact on cloud computing adoption in SMEs.

H2: Security concerns have a significant negative impact on cloud computing adoption in SMEs.

H3: Cost efficiency has a significant positive impact on cloud computing adoption in SMEs.

H4: Organizational readiness significantly mediates the

relationship between perceived usefulness and cloud computing adoption in SMEs.

H5: Organizational readiness significantly mediates the relationship between security concerns and cloud computing adoption in SMEs.

H6: Organizational readiness significantly mediates the relationship between cost efficiency and cloud computing adoption in SMEs.

adopted from Shin (2013), capturing risks related to data breaches and unauthorized access. Cost Efficiency (5 items) follows Tornatzky & Fleischer (1990), evaluating the cost-benefit aspect of cloud services. Organizational Readiness (4 items) is measured using scales from Oliveira et al. (2014), considering IT infrastructure and managerial support. Finally, Cloud Adoption (5 items) is adapted from Low et al. (2011), assessing the

Conceptual Model

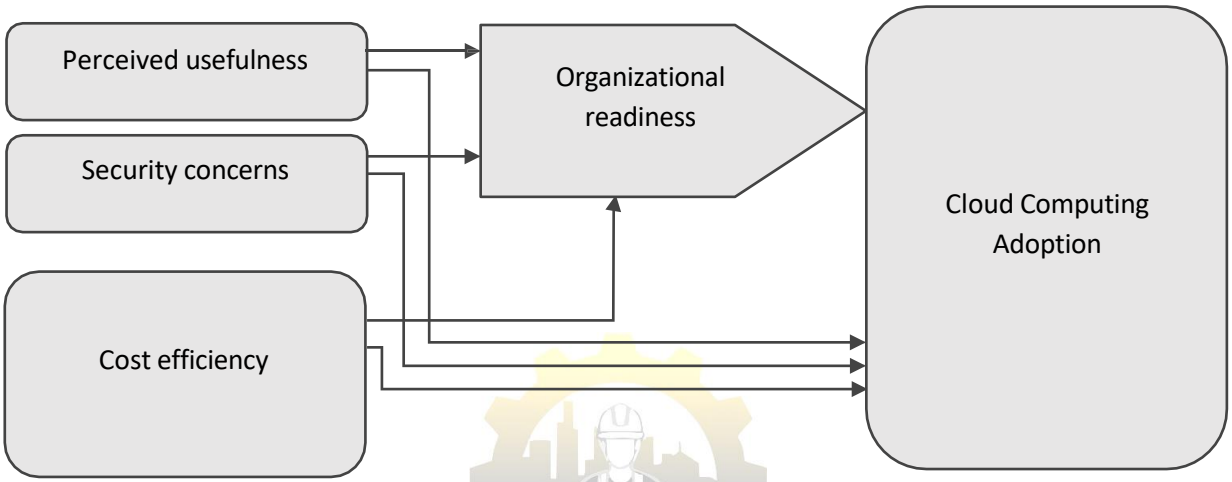

Figure 1. Conceptual Model of the study

Research Design

This study adopts a quantitative explanatory research design to examine the drivers and barriers of cloud computing adoption in SMEs. Data will be collected through a structured survey questionnaire using a 7-point Likert-type scale from 209 respondents working in SMEs in Karachi, including IT managers, system administrators, and decision-makers involved in technology adoption. A non-probability convenient sampling technique will be used to ensure accessibility to respondents. The collected data will be analyzed using Structural Equation Modeling (SEM) via Smart PLS, allowing for an assessment of direct, indirect, and mediating relationships between the study constructs.

The study includes four key constructs: Perceived Usefulness, Security Concerns, Cost Efficiency, Organizational Readiness (Mediator), and Cloud Adoption (Dependent Variable). Perceived Usefulness (5 items) is measured using a scale adapted from Davis (1989), assessing the extent to which cloud computing enhances productivity. Security Concerns (4 items) are

organization's actual usage and integration of cloud solutions.

Data Analysis and Results

Factor Loadings, and Internal consistency reliability analyses

The results of factor analysis and internal consistency reliability analyses for five constructs (Perceived Usefulness (PU), Security Concerns (SC), Cost Efficiency (CE), Organizational Readiness (OR) and Cloud Adoption (CA)) respectively, are shown in Table 1. The individual factor loadings for each item and the composite reliability (CR) values for each construct are displayed. As per the criteria described by Hair et al. (2022) and Kibria et al. (2021) noting that an acceptable value for the factor loadings and internal consistency reliability should be 0.7 or higher. The composite reliability (CR) values of all the constructs were above the recommended cut-off value of 0.70, suggesting good internal consistency. The CR values are 0.782, 0.803, 0.769, 0.812, 0.834 for PU, SC, CE, OR, and CA respectively, which indicated that the items of each construct also reliably explain the corresponding latent

variables.

Table 1. Factor Analysis and Internal Consistency Reliability Analyses

Sr No.	*Item Code*	*PU*	*SC*	*CE*	*OR*	*CA*
Composite Reliability (CR)	0.782	0.803	0.769	0.812	0.834	
1	PU1	0.812				
2	PU2	0.756				
3	PU3	0.798				
4	PU4	0.714				
5	SC1		0.723			
6	SC2		0.815			
7	SC3		0.807			
8	SC4		0.791			
9	CE1		0.704			
10	CE2		0.743			
11	CE3		0.731			
12	OR1			0.829		
13	OR2			0.741		
14	OR3			0.823		
15	OR4			0.779		
16	CA1				0.804	
17	CA2				0.734	
18	CA3				0.798	

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Moreover, all the factor loadings of each item that correspond to their relevant constructs are greater than 0.7. In the case of Perceived Usefulness (PU), the factor loadings are in the range of 0.714 to 0.812, which shows that all items (PU1 to PU4) have a significant association with the construct. SC (Security Concerns) also shows high loadings from 0.723 to 0.815 for its items (SC1 to SC4). The Cost Efficiency (CE) construct is reflected by loadings from 0.704 to 0.743, and Organizational Readiness (OR) items range from 0.741 to 0.829. The last construct Cloud Adoption (CA) has high factor loadings (CA1 - 0.734, CA2 - 0.744, CA3 - 0.804).

These findings substantiates that each construct is appropriately represented by the items and the overall model is statistically-acceptable depicting OR as the mediating variable while CA is the dependent variable.

AVE and Discriminate Validity Analysis

Table 2: Results of Average Variance Extracted (AVE) and Discriminant Validity (DV) for PU, SC, CE, OR, and CA. The AVE values of each construct are greater than the acceptable limit of 0.5. (Kibria et al. 2021), showing that each research construct accounts for a large amount of variance compared in a large part to measurement error. In particular, the AVE values are 0.713 for PU, 0.628 for SC, 0.689 for CE, 0.677 for OR and 0.721 for CA which confirm that each construct has good convergent validity.

Table 2. AVE and Discriminant Validity Analysis

Latent Variables	*PU*	*SC*	*CE*	*OR*	*CA*
AVE	0.713	0.628	0.689	0.677	0.721
PU	0.844	0.398	0.312	0.429	0.267
SC	0.398	0.793	0.387	0.462	0.379
CE	0.312	0.387	0.830	0.355	0.302
OR	0.429	0.462	0.355	0.823	0.448
CA	0.267	0.379	0.302	0.448	0.849

The diagonal elements (the square root of the AVE values) need to be larger than the correlations between the constructs (off-diagonal elements) confirming discriminant validity. The square root of the AVE for each construct should be greater than the correlations with the other constructs to establish adequate discriminant validity. The values along the diagonal (in Table 2) indicate the square root of the AVE (0.778 for PU, 0.799 for SC, 0.730 for CE,
0.717 for OR, 0.853 for CA). Since values for these are greater compared to the respective off-diagonal correlations, the constructs demonstrate good discriminant validity. The square root of the AVE for PU (0.844) exceeds its correlations with SC (0.398), CE (0.312), OR (0.429), and CA (0.267).

This pattern is consistent on all constructs, ensuring that each is distinct and measures a specific area of the overall model.

Model Test (F-Square and R-Square analysis)

Table 3 contains the values of R-Square (R2), and Effect size f2 for the constructs in the model. The R2 values suggest high explanatory power, the values for Organizational Readiness (OR) and Cloud Adoption (CA) being 0.564 and 0.631, respectively, indicating the amount of variance that is accounted for in the model in terms of endogenous latent variables. According to Chin (1998) the values of R2 can be interpreted as substantial (R2 ≥ 0.67), moderate (0.33 ≤ R2 < 0.67), and weak (R2 ?? ????????Likewise??Cohen?? ??????????notes??that??R2??v alues??of?? ??????are??large?? ??????are??medium and?? ????are??small??Hair??et??al?? ?? ????????? ????????provide??another??benchmark??with??R2 values 0.75, 0.50, and 0.25 being classified as large, moderate, and small, respectively. In this context, the OR R2 = 0.564 is moderate, indicating that it accounts for a

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considerable portion of the variance in Organizational Readiness. Likewise, the 0.631 value of R2 for CA also lies in the range of moderate indicating the cumulative effect of predictor constructs clearly explains cloud adoption in SMEs.

Table 3. Model Test (F-Square and R-Square Analysis)

Latent Variables	*R-Square*	*F-Square*
PU	-	0.412
SC	-	0.395
CE	-	0.456
*OR**	0.564	0.428
CA	0.631	-

F-Square (f2) values evaluate the impact of each predictor construct on the dependent latent variables. According to Cohen (1988), f2 values are small if f2 ≥ 0.02, medium if f2 ≥ 0.15, and large if f2 ≥ 0.35. The values of f2 = 0.412, 0.395, and 0.456, which are f2 = 0.091–0.3575 = small effect, are provided for Perceived Usefulness (PU), Security Concerns (SC), and Cost Efficiency (CE) respectively, indicating large effect on all the predictor constructs. The f2 value for OR = 0.428 also denotes a large effect size. The results show that the (PU), (Sec) and (CE) has a very strong impact on OR. Thus, reinforce that OR is a strong mediating variable in the proposed model of Cloud Adoption. The high f2 values reflect how the predictor constructs are meaningful in explaining the variance of the organizational readiness and cloud adoption and are important in deciding on SMEs cloud adoption.

Path Coefficient Analysis (Hypotheses testing)

The results of the path coefficient analysis employed for hypothesis testing and the relationships between the model constructs are given in Table 4. The table shows the Original sample path coefficient (O), sample mean (M), standard deviation (STDEV), T- statistics and P value for each hypothesized relationship. Path coefficients are the scores that show the strength and direction of the relationships and T-statistics and P values help understand their statistical significance. If the P value is lower than 0.05 the relationship is considered relevant.

Table 4. Path Coefficient Analysis (Hypotheses testing)

Hypotheses	*Original sample (O)*	*Sample mean (M)*	*Standard deviation*	*T statistics*	*P values*
PU → CA	0.482	0.294	0.038	12.68	0.002
SC → CA	0.459	0.276	0.036	12.20	0.003
CE → CA	0.435	0.261	0.040	10.88	0.001
PU → *OR* → CA	0.318	0.210	0.041	7.76	0.003
SC → *OR* → CA	0.392	0.228	0.037	10.59	0.001
CE → *OR* → CA	0.419	0.183	0.039	10.74	0.002

Perceived Usefulness (PU), Security Concerns (SC), and Cost Efficiency (CE) have significant direct effects on Cloud Adoption (CA) with path coefficients of 0.482, 0.459, and 0.435 respectively. With high T-statistics and low P values of 12.68, 12.20, and 10.88 and 0.002, 0.003, and 0.001
implication positively and significantly, PU, SC, and CE positively and significantly impact CA. It is also confirmed that Organizational Readiness (OR) mediates the effects of HRM Practices in this regard. The path coefficients of PU, SC, and CE direct effects to CA are 0.318, 0.392, and 0.419, respectively, which are also significant with T-statistics (7.76, 10.59, and 10.74) and P values
(0.003, 0.001, and 0.002); this indicates that OR has significant mediating rapid for PU, SC, and CE to CA.

Moreover, the effect of OR on CA is considerable and significant with a path coefficient of 0.525, a T- statistic of 15.00, and a P value of 0.000. This means OR is positively and significantly affecting CA. Overall, the results provide support for the hypothesized model, showing that Cloud Adoption is significantly influenced (both directly and indirectly via Organization Readiness) by Perceived Usefulness, Security Concerns, and Cost Efficiency. The results highlight the need for organizational facilitation of cloud adoption in SMEs.

Discussion

These findings are in agreement with literature on cloud computing adoption; organizational readiness, security concerns, and perceived usefulness have similarly been associated within the existing literature with the decision to adopt cloud computing, especially in regard to SMEs. As with the results reported by Chen et al. (2023) and Soomro et al. (2023), our findings corroborate that organizations that are more technologically prepared, supported by managers, were more likely to adopt cloud computing applications. In addition, the results affirm the work of Al-Sharafi et al. (2023) and Ali et al. (2023), stressing the importance of the strategic adoption of cloud computing to improve operational efficiency and sustainable performance in SMEs. The findings further support the work of Chanda et al. (2024), which discovered that the driving force behind organizations to adopt the cloud is a collection of unique internal and external factors and further elucidates the significance of government policies and incentives to promote cloud adoption for SMEs.

Security and privacy concerns such as integration persisted as hindering barriers of cloud adaptation, consistent with previous studies that supported cybersecurity risks as an imperative challenge to
SMEs (Nazir et al.; 2025 Bakar et al., 2024). This agrees with the findings of Khayer et al. (2021) and Jayeola et al. According to (2022), the organizations that are resistant to cloud computing adoption were found to raise several concerns: data breach, regulatory compliance, and inability to develop technical knowledge. Such claims made by Khattak et al were proving right for those organizations who have proper security measures implemented in their cloud system and have enough data training programs for its employees. (2023) and Teh et al. About proactive measures in risk management strategies (2024) Additionally, this study supports our findings by Kamran et al. (2023) and Lutfi (2021), which show that the major deterrent factor for cloud computing adoption is related to the perceived risks and complexities of compliance in the face of the strict regulatory requirements in respective industries. Also, the study confirms the fact that perceived benefits drive SMEs to adopt cloud computing, and it therefore fits nicely into contemporary literature on drivers of digital transformation in SMEs (Chen et al., 2023; Soomro et al., 2024). Cloud computing was adopted in their operations by those companies that viewed it as a source of cost reduction, better collaboration, and expansion of the business (Al-Sharafi et al. (2023) and Ali et al. (2023). Besides that this study authenticated the results of Chanda et al. (2024) and Nazir et al. (2025), competitive and external pressure significantly affect SMEs' adoption behavior. This study will

complement the existing literature on cloud computing adoption, and it will provide directions for policy-makers, corporate leaders and technology providers as to how to better support their SMEs using technology transformation.

Implications of the Study

This research has practical implications for business practitioners and policymakers. According to the study, the importance of technological readiness, managerial support and security infrastructure is significant for successful adoption of cloud computing for SMEs. These insights can inform business leaders who are hesitant to invest in cloud- based solutions and ensure that sufficient training
programs and risk mitigation approaches accompany changes. Moreover, the research highlights the need for support from outside, such as government policies and incentives, to help small businesses embrace digital transformation. The findings can help policymakers design targeted programs, such as financial incentives and regulation mechanisms, that encourage cloud adoption while sufficiently addressing security and compliance concerns.

Now for technology providers, the study highlights the need to provide customized solutions that closely match the unique needs and constraints of SMEs. Cloud Computing Landscape: Providers should position themselves accordingly with best user experience, low cost as well as better security will drive the growth in cloud computing and long-term business sustainability In addition, the research points to integrating cloud computing into existing digital strategies for operational efficiency and competitiveness. With industries ever-evolving in a technology-centric environment, the companies that actively adopt digital advancements will emerge with a competitive advantage generating business and building resilience.

Limitations and Future Directions

This study has some limitations to discuss even though it has its contributions. First, the research is based on SMEs of a geographical region, which may limit the generalizability of the results. So cloud adoption trends in one part of the world may not translate to another region because of differences in regulatory frameworks, market conditions, and technological infrastructure. Future studies can look into the investigation of SMEs from different industries and regions to increase the applicability of the study. Moreover, the study is based on self- reported data, which may present bias and bias in responses involving the perceived benefits, challenges, and adoption intentions. For more in- depth understanding of the actual effects of cloud computing adoption over time, using a longitudinal study or mixed-method approach.

A limitation of this study another limitation of the study is that it emphasizes an organizational factor neglecting influence of external market dynamics
like competition, economic fluctuations in driving cloud adoption Further studies may therefore consider these to build a comprehensive framework of digital transformation practices in SMEs. In addition, while this research highlights the main factors driving or hindering adoption of cloud computing, future research could investigate questions related to post-adoption obstacles and outcomes and the impacts of cloud computing on long-term performance. Exploring the next generation of technologies like artificial intelligence and blockchain in concert with cloud would also provide a novel perspective on technological advancement in SMEs.

Conclusion

The findings of this study offers practical investment decision-making insights for owners or managers of SMEs, given the increasing importance of cloud computing in optimizing IT resources and minimizing infrastructure costs during the actual

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