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FACTORS AFFECTING CLOUD ACCOUNTING ADOPTION IN SMES USING THE TOE FRAMEWORK

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Abstract: This study aims to explore the factors that can influence the adoption of cloud accounting in MSMEs. Software such as cloud accounting has a very important role in business activities in the field of accounting because it can help businesses stay financially organized. This will help MSMEs make better business decisions based on accurate and real-time financial data. The population used in this study were MSMEs located in Soloraya. The research method used in this research is quantitative with data collection methods using gform and paper questionnaires. The data analysis technique used in this research is SEM (Central Equation Model) analysis with the help of the SmartPLS 3.0 program. The results of this study indicate that factors such as relative advantage, top management support, adequate resources, business partner pressure, provider support (except security concerns) positively and significantly affect cloud accounting adoption in MSMEs in Soloraya. Therefore, this research is expected to help recommend and encourage MSME decision makers in Soloraya to be able to adopt cloud accounting in their business.

Keywords: TOE, Indonesia, Cloud Accounting, MSMEs

1. Introduction

Essentially, Micro, Small, and Medium Enterprises (MSMEs) are one of the largest driving forces of the Indonesian economy, even outnumbering large companies (Maksum et al., 2020). MSMEs can equalize income distribution because they are highly competitive in an almost perfect market structure, without monopolies and easy to access (Darwanto, 2008). According to data from the Indonesian Chamber of Commerce and Industry (KADIN) in 2023, MSMEs in Indonesia contributed more than 61% of Indonesia's Gross Domestic Product (GDP), or around IDR 9,580 trillion annually. In addition, the contribution of MSMEs can also be seen from their employment absorption, which reaches up to 97% of the total workforce. Based on data from the Ministry of Cooperatives and SMEs, Indonesia has approximately 65.5 million MSMEs, accounting for 99% of all business units spread across various regions in the country. This significant potential of MSMEs is the reason why the government continues to develop MSMEs in Indonesia to better compete on a global scale.

Many organizations or companies have become vulnerable to the influence of business digitalization, the potential of the internet, the implications of big data, and the growing importance of data mining (Darwanto, 2008). Among various organizational fields, the economic sector has experienced the most significant developments in digitalization, especially in accounting. Accounting plays an essential role in economic activities, particularly for business actors to record their business activities using computerized systems, ensuring that all financial transactions are accurately and quickly documented. Therefore, software like cloud accounting plays a crucial role in business activities in the accounting field, as it helps businesses stay financially organized (Azadi Marand et al., 2013). This cloud accounting model enables business organizations, including employees, vendors, and customers, to collaborate simultaneously via the internet to access up-to-date financial reports (Dimitriu & Matei, 2014).

Currently, most MSMEs (Micro, Small, and Medium Enterprises) in the Soloraya region still face several challenges related to the use of financial technology to support their business growth. This occurs because many of these MSMEs do not have well-administered financial management. First, most businesses still rely on manual accounting records. Second, not all MSMEs are willing to document their business finances. Some of them express that their limited knowledge makes it difficult for them to record finances using cloud accounting services. The risk of errors arising from manual record-keeping is higher compared to using software, and the data is also considered less accurate.

Although previous research on cloud accounting is already quite extensive, this study remains interesting to revisit for several reasons. First, MSMEs in Indonesia are growing and increasing in number. Second, despite the growth of many MSMEs in Indonesia, a significant number still rely on manual record-keeping rather than using software. This study refers to the research by (Chen et al., 2023), which examined the determinants of cloud computing adoption by SMEs based on cloud promotion policies. The difference in this study lies in the variables. The variables in this research are relative advantage, security concerns, top management support, adequate resources, business partner pressure, and provider support for cloud accounting.

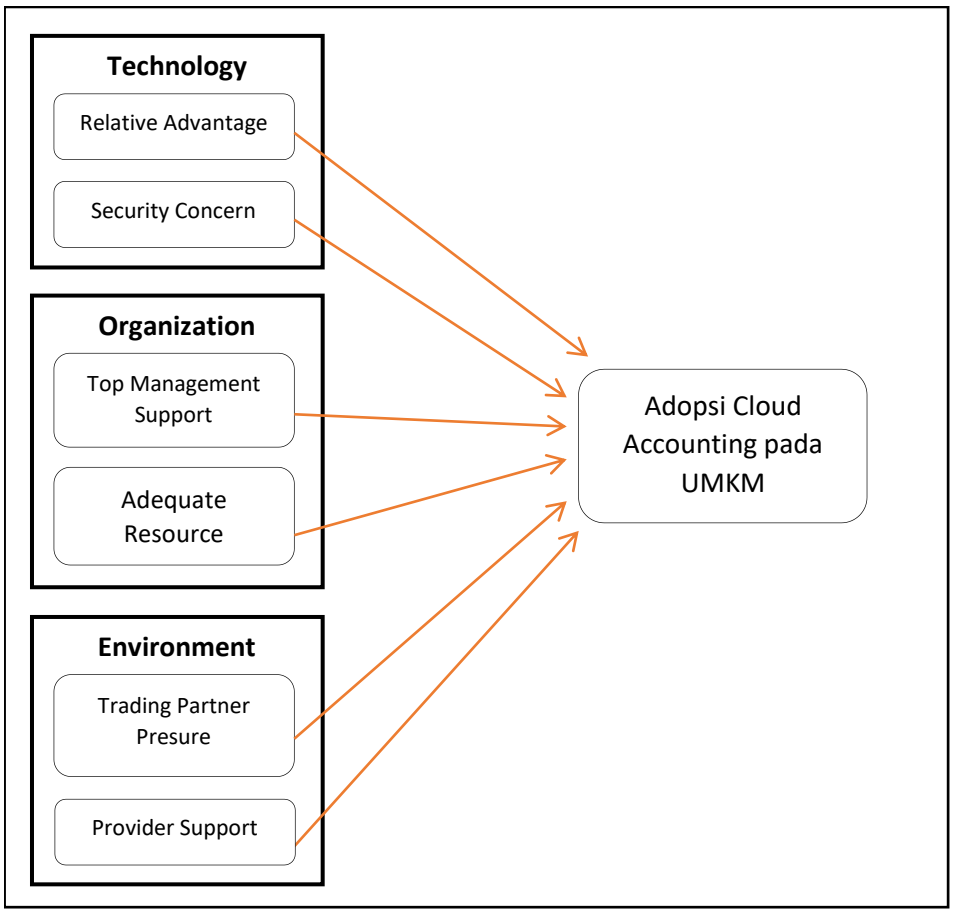

Figure 1 Research Framework

2. Literature Review

Technology Organizatipon Environment (TOE Framework)

The TOE (Technology-Organization-Environment) theory is one of the most commonly used theories in research on Accounting Information Systems, first introduced and developed by Tornatzky and Fleischer (1990). This theory suggests that an innovation can evolve by identifying three aspects of technology adoption at the organizational level: technology, organization, and environment (Oliveira & Martins, 2010). The TOE theory is considered important as a theoretical guide for IT adoption, because, according to Swanson (1995), complex IT adoption requires a profitable technology portfolio, organizational structure, and environmental strategy. This TOE framework includes three contextual aspects that can influence a company's process in adopting and implementing technological innovations, namely: the technological context, the organizational context, and the environmental context.
According to Dewi (2018), the TOE framework has the following contexts: (1) technological context, this refers to both internal and external technologies, including equipment and processes that focus on the structure, quality, and characteristics of an organization's technology, which can influence adoption and innovation; (2) organizational context, this relates to key resources and the nature of the business, including the scope, size, company structure, and employee culture (Rahayu & Day, 2015). Some attributes of the organization include structure, objectives, size, resource quality, and decision-making mechanisms that can facilitate the adoption of new innovations; (3) environmental context, this represents all external factors that are part of the organization, such as competitors, suppliers, government, customers, or even communities that can determine whether innovation is needed, and the ability to provide resources that facilitate innovation as well as the capability to implement the innovation.

Diffusion of Innovation Theory

The Diffusion of Innovation (DOI) theory, introduced and developed by Rogers (2003), is a theoretical framework that explains the adoption and utilization of information technology to help innovations develop. The DOI theory serves as a theoretical foundation in studies of IT/IS adoption, both at the individual and organizational levels, across various contexts (Maryam Salahshour Rad, 2018). According to Matias & Hernandez (2021), the DOI theory can illustrate the adoption patterns of a technological innovation mechanism, which in turn can help predict the success of a technological innovation.
The DOI theory emphasizes that two factors influence technological innovation: the attributes of innovation and the innovation within the company. The innovation attributes include relative advantage, compatibility, complexity, trialability, and observability in explaining the level of individual adoption. Meanwhile, innovation relates to independent variables such as leadership characteristics, internal company structure, and external features (Sastararuji et al., 2021). The TOE context is often associated with the five attributes of DOI, but there are some differences between them. The TOE theory considers the external environment, which can have a positive or negative influence on technology adoption, whereas the DOI theory does not take external factors into account when addressing technological innovation (Oliveira & Martins, 2010).

Hypothesis Development

The Influence of Relative Advantage on the Adoption of Cloud Accounting in MSMEs

According to relative advantage shows how the currently available methods are better than the previous ones. Similarly (Scott et al., 2008), define relative advantage as how a new innovation

is perceived as better than the previously available innovation. This study defines relative advantage as the extent to which the currently available method is more beneficial than the previous one. When compared to traditional accounting, cloud accounting offers companies more opportunities, such as information access from anywhere and faster financial data updates. Cloud accounting also helps minimize the risk of data loss due to viruses attacking data stored on desktops, which is common in traditional accounting (Khanom, 2017). The research by Karkonasi et al. (2009) found that cost savings are one of the variables influencing cloud computing adoption. A study by (Chemjor & Lagat, 2017; Low et al., 2011) also found that relative advantage has a significant impact on the adoption of cloud computing.
H1: Relative advantage has a positive effect on the adoption rate of cloud accounting in MSMEs.

The Influence of Security Concern on the Adoption of Cloud Accounting in MSMEs
Information security refers to the effort to protect information assets from potential threats. Ensuring information security indirectly supports business continuity, reduces emerging risks, and enables companies to optimize their return on investment (Puriwigati & Buana, 2020). There are four dimensions or indicators of information security, particularly in terms of privacy: privacy as a human right, privacy as a commodity, privacy as a state of limited access, and privacy as the ability to control information about oneself. (Jeff Smith et al., 2011). Research conducted by (Hemlata Gangwar, 2015) shows that concerns over security can inhibit organizations from adopting cloud computing and cloud accounting technologies, as they prioritize the security and protection of their data. In the context of MSMEs, security concerns often stem from fear of unauthorized access, data breaches, or loss of sensitive financial information stored in the cloud. Given this, companies that perceive a higher security risk may be more reluctant to adopt cloud accounting solutions, as they prefer to maintain control over their data and are wary of external threats to their systems
H2: Security concern has a negative effect on the adoption rate of cloud accounting in MSMEs.

The Influence of Top Management Support on the Adoption of Cloud Accounting in MSMEs
According to (Hartono, 2010), top management support refers to the form of support provided by managers to system users. One form of such support is the provision of facilities. These facilities can include training and offering assistance to system users when they encounter issues related to the system. The research results by (Hemlata Gangwar, 2015) indicate that support from senior leaders and executives within an organization is a key factor that can encourage the organization to adopt cloud computing and cloud accounting technology.
H3: Top management support positively influences the level of cloud accounting adoption in MSMEs.

The Influence of Adequate Resources on the Adoption of Cloud Accounting in MSMEs
Ensuring that adequate resources are available in an organization is crucial as it relates to the effective implementation of cloud computing. This not only includes financial investment but also the availability of trained IT staff and supporting infrastructure (Sharma & Bhatt,2018). Several studies have shown that this is an important determinant of IT adoption in various contexts, such as in master data management (Haneem et al., 2019) and mobile marketing (Martins et al., 2016). According to other research by (Al-Badi, Tarhini & Al-Qayoudi, 2018)

the success of cloud computing adoption largely depends on the availability of adequate resources, including technological infrastructure, financial capability, and skilled labor.
H4: Adequate resources positively influence the level of cloud accounting adoption in MSMEs.

The Influence of Trading Partner Pressure on the Adoption of Cloud Accounting in MSMEs

Trading partner pressure can be identified as a significant external driver that influences the adoption of cloud computing, including cloud accounting. Cloud technology is often adopted by organizations to meet the demands and expectations of their business partners (Low et al., 2011). Research by (Oliveira et al., 2014) shows that organizations feel encouraged to use cloud accounting systems because their business partners expect better technology integration and improvements in how organizations collaborate.
H5: Trading partner pressure positively influences the level of cloud accounting adoption in MSMEs.

The Influence of Provider Support on the Adoption of Cloud Accounting in MSMEs

In cloud accounting, business partners inevitably interact with cloud service providers. Support from these cloud service providers is considered one of the key factors in the implementation of IT solutions such as cloud accounting, cloud computing, and other forms of computing (Alshamaila et al., 2013; Hemlata Gangwar, 2015), digital transformation outsourcing (Mazumder & Garg, 2021), and big data analytics (Maroufkhani et al., 2022). Therefore, service providers must be able to provide data at all times, or more precisely when clients need it (Awa & Ojiabi, 2016; Gangwar et al., 2015). Consequently, cloud accounting vendors must recruit and train adequate support staff to deliver the best service to their clients (Awa & Ojiabo, 2016; Kim, 2009). Research results from (main journal) show that vendor support can have a positive impact on the adoption of cloud computing by SMEs.
H6: Provider support positively influences the level of cloud accounting adoption in MSMEs.

3. Method

This study is quantitative, using purposive sampling techniques, with data analysis conducted through Structural Equation Modelling-Partial Least Square (SEM-PLS). Online and paper questionnaires were used as the primary data collection methods. The online questionnaire, in the form of a Google Form, was distributed through WhatsApp and Instagram platforms, while paper questionnaires were distributed directly to MSME practitioners. The sampling criteria used in this study are as follows: (a) MSME practitioners located in Soloraya, and (b) MSMEs that are already using cloud accounting technology
The data collection process was distributed to 210 prospective respondents. However, out of the 210 potential respondents, only 155 valid responses were collected and could be used as data for this research. The data was then analyzed using the SmartPLS 3.0 application.

4. Result and Discussion

Table 1 presents the demographic data of respondents in this study. Based on the table, the respondent composition shows that 51.6% hold the position of owner, 2.6% are managers, and 45.8% are employees. In terms of business type, the majority of respondents are in the culinary sector (45.8%), followed by craft (1.3%), fashion (12.9%), photography (1.3%), film animation & video (1.3%), fine arts (1.3%), application & game development (0.6%), publishing (1.3%), product design (2.6%), architecture (1.3%), and others (29.7%). Regarding business age, 26%

of the businesses have been operating for less than 1 year, 48.4% for 1–5 years, 22.6% for 6–10 years, and 8.4% for more than 10 years. In terms of the number of employees, most respondents have 1–4 employees (73.5%), followed by 5–10 employees (23.2%), 11–99 employees (2.6%), and more than 99 employees (0.6%). Finally, based on the respondents' use of cloud accounting, 55.5% of the respondents have adopted cloud accounting, which is higher than the 44.5% who have not yet used it.

Table 1 Respondent Data

Characteristic	Category	Total	Percentage
Position	Owner	80	51,6%
	Manager	4	2,6%
	Employees	71	45,8%
Business type	Culinary	71	45,8%
	Crafts	2	1,3%
	Fashion	20	12,9%
	Photography	2	1,3%
	Animated films & videos	2	1,3%
	Fine arts	2	1,3%
	Application & game	1	0,6%
	development	2	1,3%
	Publishing	4	2,6%
	Product design	2	1,3%
	Architecture	46	29,7%
	Other		
Time of the business	< 1 tahun	32	20,6%
	1 – 5 tahun	75	48,4%
	6 – 10 tahun	35	22,6%
	> 10 tahun	13	8,4%a
Number of employoes	1 – 4 employees	114	73,5%
	5 – 10 employees	36	23,2%
	11 – 99 employees	4	2,6%
	> 99 employees	1	0,6%
Using cloud accounting	Yes	86	55,5%
	Not yet	69	45,5%

Sources: data analysis

Measurement Model Test

The results of the convergent and discriminant validity tests show that all items are valid and meet the required criteria. As seen in Table 2, the cross-loading values for all items are above 0.7. Additionally, the reliability test yielded Cronbach's Alpha values above 0.7, except for the security concern variable, and the AVE (Average Variance Extracted) values are above 0.6, except for the security concern variable. Therefore, it can be concluded that the constructs in this study are somewhat unreliable.

Table 2 Validitas dan Reliabilitas Konvergen

Construct	Item	Cross Loading	Cronbach's Alpha	rho A	CR	AVE
Relative Adventage	RA 1	0,748	0,857	0,906	0,895	0,630
	RA 2	0,815				
	RA 3	0, 821				
	RA 4	0,769				
	RA 5	0,812				
Security Concern	SC 1	0.800	0,644	0,650	0,807	0,582
	SC 2	0,773				
	SC 3	0,714				
Top Management Support	TMS 1	0,876	0,892	0,898	0,925	0,756
	TMS 2	0,826				
	TMS 3	0,924				
	TMS 4	0,848				
Adequate Resource	AR 1	0,899	0,897	0,902	0,935	0,828
	AR 2	0,913				
	AR 3	0,918				
Trading Partner Pressure	TP 1	0,885	0,870	0,886	0.920	0,792
	TP 2	0,878				
	TP 3	0,907				
Provider Support	PS 1	0,917	0,879	0,888	0,925	0,805
	PS 2	0,890				
	PS 3	0,885				

Sources: data analysis

Table 3 presents the results of the discriminant validity test. These results indicate that all constructs meet the required criteria, as the AVE (Average Variance Extracted) of each construct is higher than the correlation values between other constructs. Therefore, it can be concluded that discriminant validity has been achieved.

Table 3 Validitas Diskriminan

Variabel	CA	TMS	PS	SC	RA	AR	TP
CA	0,871						
TMS	0,590	0,869					
PS	0,763	0,579	0,897				
SC	0,407	0,528	0,361	0,706			
RA	0,521	0,549	0,468	0,337	0,794		
AR	0,662	0,728	0,614	0,450	0,437	0,910	
TP	0,662	0,647	0,658	0,435	0,411	0,759	0,890

Catatan : CA = Cloud Accounting, RA = Relative Advantage, SC = Security Concern, TMS = Top Management Support, AR = Adequate Resource, TP = Trading Partner Support, PS = Provider Support

Source: data analysis

Structural Model Test

Based on the results of hypothesis testing, it can be seen that six hypotheses are significantly supported. As shown in Table 4, the variables of relative advantage, security concern, top management support, adequate resources, trading partner support, and provider support all have a significant effect on cloud accounting adoption.

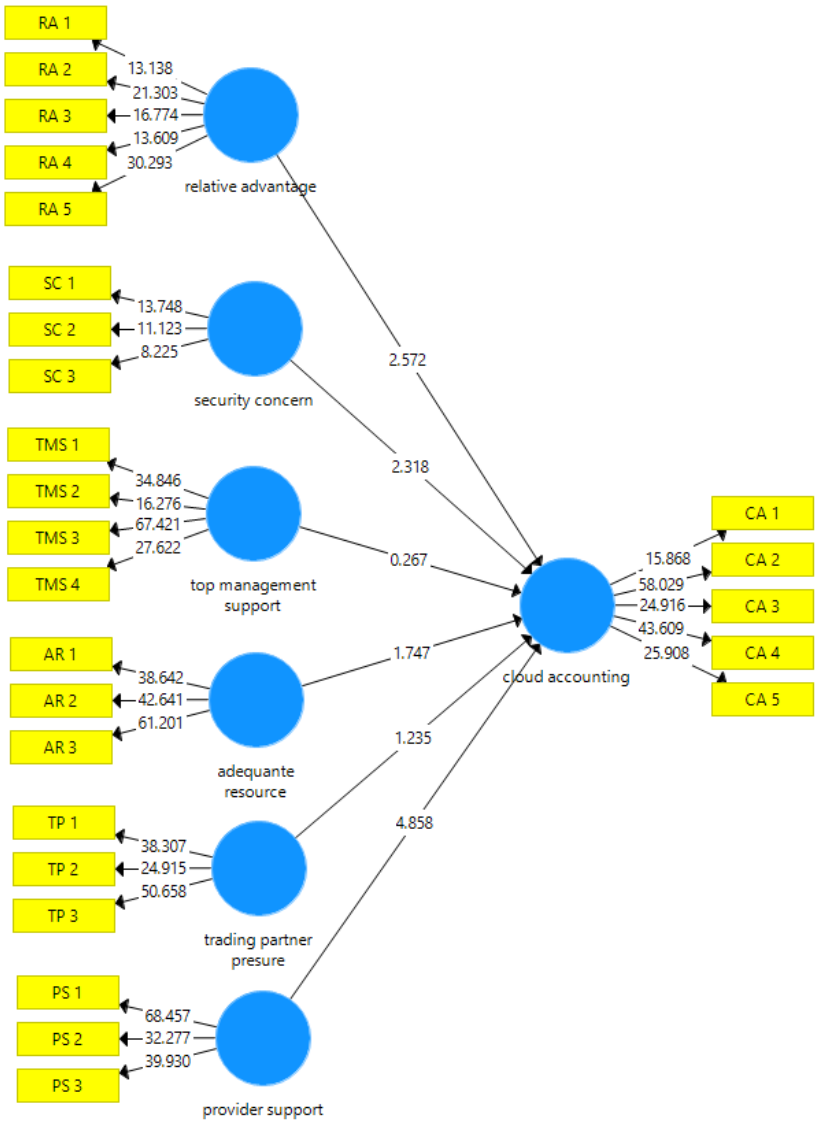

Figure 2 Goodness of Fit result Model

Goodness of fit results for this model are presented in the following table:

Table 4 Structural Model Test

Hypothesis	Original Sample	T Statics	P Value	Information
H1: RA -> CA	0,200	2,572	0,005	Supported
H2: SC -> CA	0,121	2,318	0,010	Supported

H3: TMS -> CA	-0,025	0,267	0,395	Not Supported
H4: AR -> CA	0,165	1,747	0,041	Supported
H5: TP -> CA	0,113	1,235	0,109	Not Supported
H6: PS -> CA	0,440	4,858	0,000	Supported

Source: data analysis

Catatan: CA = Cloud Accounting, RA = Relative Advantage, SC = Security Concern, TMS= Top Management Support, AR = Adequate Resource, TP = Trading Partner Support, PS= Provider Support

This study examines the relationship between relative advantage, security concern, top management support, adequate resources, trading partner support, and provider support in relation to cloud accounting. H1 shows that relative advantage has a positive effect on cloud accounting, with a p-value of 0.005. This aligns with previous research by which demonstrated that relative advantage is a significant positive factor in cloud accounting and cloud computing adoption. H2 shows that security concern has a positive effect on cloud accounting, with a p-value of 0.010. This is consistent with research by (Chen et al., 2023; Saad et al., 2022) proving that security concern is a significant positive factor for cloud accounting adoption. H3 shows that top management support does not have a positive effect on cloud accounting, with a p-value of 0.395. This is in line with previous studies by (Ali, 2020; Aligarh et al., 2023) which found that top management support does not have a significant influence on cloud computing adoption. H4 shows that adequate resources have a positive effect on cloud accounting, with a p-value of 0.041. This result agrees with previous research by (Hamzah et al., 2023) demonstrating that adequate resources are a significant positive factor for cloud accounting and cloud computing adoption. H5 shows that trading partner support does not have a positive effect on cloud accounting, as indicated by its p-value. This finding aligns with prior research by (Setiawan & Gui, 2023), which found that trading partner pressure does not significantly influence cloud computing adoption. H6 shows that provider support has a positive effect on cloud accounting, with a p-value of 0.000. This supports previous research by (Chen et al., 2023), which demonstrated that provider support is a significant positive factor in cloud accounting adoption.

5. Conclusions

Based on the results of the research on the factors influencing the use of cloud accounting among MSMEs in Soloraya, it can be concluded that factors such as relative advantage, security concern, adequate resources, and provider support are the dominant factors that drive MSME practitioners in Soloraya to adopt cloud accounting. On the other hand, the factors of top management support and trading partner support do not significantly influence the decision of MSME practitioners to use cloud accounting.

The implications of this research suggest that all MSMEs in Soloraya are encouraged to adopt and develop cloud accounting technology in their businesses. The use of cloud accounting can enhance the efficiency and effectiveness of the company, improve the quality of information, and enable businesses to compete with other companies that have already implemented cloud accounting software to meet their business needs.

The limitations of this research include the limited sample size due to the small geographical coverage. In addition to the limited coverage, there was also a lack of respondents willing to

complete the questionnaire. This study focused only on a few factors as measurement indicators to assess the extent of cloud accounting adoption by MSMEs in Soloraya. Future research is expected to expand the geographical scope and include additional variables in the study.

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