Journal of Theoretical and Applied Information Technology
15th January 2023. Vol.101. No 1

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

EFFECT OF TECHNOLOGY ORGANIZATION ENVIRONMENT AND INDIVIDUAL FACTORS TOWARDS ADOPTION INTENTION OF CLOUD-BASED ACCOUNTING SOFTWARE IN MSMES

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ABSTRACT

The purpose of this research is to examine the adoption of technology, organization, environment, and individual factors towards the intention of cloud-based accounting software in MSMEs. The research method used is descriptive statistics with survey as data collection method which was distributed to owners/co-owners/manager of micro enterprises in Tangerang Regency. This research uses multiple regression analysis with SPSS version 25 as the data analysis tool. The result of the research shows that technology, organization, environment, and individual factors simultaneously affect the adoption intention of cloud-based accounting software in MSMEs, however technology and environment factors are the only factors that partially affect the adoption intention of cloud-based accounting software in MSMEs. The result contrasted results of the previous research but it is also in line with most research which stated that technology, organization, environment, and individual factors simultaneously affects the adoption intention of technology advancement.

Keywords: *TOE Framework, Technology, Adoption, Intention, MSME, Micro, Enterprise.*

1 INTRODUCTION

1.1 Research Background

Indonesia is a developing with major economy growth, this fact supports the important existence of Micro, Small, and Medium Enterprises (MSMEs) in Indonesia. Based on the data provided by the Ministry of Cooperatives and SMEs (KemenKopUKM), the number of MSME in Indonesia reached up to 64.2 million enterprises. MSMEs also contributed up to 61.07% of the country's Gross Domestic Product (GDP) and absorbs 97% of the country's domestic workforce. The Indonesian government has given strong support to MSME through interest subsidies, credit restructuring, expansion of working capital loans, guarantees for working capital loans, tax incentives, and various other things such as training and seminars. The support provided by the government was conducted to help MSMEs grow and survive especially during the COVID-19 Pandemic. Despite the support provided by the government, MSMEs in Indonesia still struggles to find access towards capital lending which could be used for enterprise development [1].

MSMEs in Indonesia still rely heavily on government for financial support in sustaining their business. This is due to their poor financial management, which is the main reason as to why many MSMEs fail to survive [2]. Most MSMEs are not able to create a financial statement adhering to the accounting standard which is needed for the lending or borrowing process conducted by financial institutions [3]. Financial statement could also help increase MSME's accountability which could help smooth out the borrowing process whether it is through the government lending or other financial institutions [4]. Good financial management could also give MSME owners a better picture on how their business is currently doing. A good financial management is achieved through a correct and systematic bookkeeping [5], this can be achieved through the usage of cloud-based accounting software.

Cloud-based accounting software is an emerging technology in the field of accounting which serves as a function to bookkeep, create invoices, and generate financial statements [6].

Through the usage of cloud-based accounting software, MSMEs are able to gain more efficiency and effectiveness in their accounting process. Cloud-based accounting software comes with a pay-per-use option where the user pays only on what they choose to use which gives MSME a variety of price point they could consider for their business (Huang, 2016). This technology is also able to generate financial statements that are in accordance with the existing accounting standard for MSME in Indonesia which is SAK-ETAP [3].

Despite the benefits presented, MSME still has a low technology adoption rate especially in accounting. The main reason this is MSME have limited resources they could allocate for technology adoption. There is also the fact that MSME owners have limited knowledge in specialized fields such as technology [7]. All these factors combined hinder the possibility of MSME adopting technology to develop their business. Despite these limitations, a study by OJK with Boston Consulting Group (BCG) shows that MSME has high enthusiasm towards technology adoption and hope for support in utilizing technology in their business.

Technology adoption is one of many ways MSME could generate a sustainable competitive advantage in the era of globalization that fuels technological advancement. By using technology MSME is exposed to the market the same way LE is, technology can help MSME save operating costs, adds value in products, increase collaboration, and overall increases the competitive advantage of business [8]. Flexibility is a key advantage MSME have over Large Enterprises (LE), where MSMEs are capable of adapting to changes that happened in the market faster than LE would, however technology adoption rate in MSME is still fairly low [9]. This research would like to see what factors influenced technology adoption specifically cloud-based accounting software adoption in MSMEs. In conducting the research, the Technology-Organization-Environment (TOE) Framework developed by [10] along with the Diffusion of Innovation (DOI) Theory by Rogers will be used to develop the research framework. These theories and frameworks have been widely used in technology and innovation adoption research, especially in the organization level [11].

The different characteristics of MSME and LE should be considered in researching technology adoption. MSME has a high level of centralization, this indicates that the owners or managers in charge is highly influential in determining business activities especially long-term business solutions such as technology adoption. Decisions made in MSME often reflect the owner's or manager's characteristic, this includes how far do owners or managers understand or is aware on technology and accounting. Innovativeness is also considered as a determining factor in technology adoption, as innovative owners will propose the use of technological advances in their business and conventional owners would choose a more traditional yet sure solution in their business [12]. Therefore, this research will consider individual factors as one of the determining factors of technology adoption in MSMEs.

1.2 Research Objective

The objective of our research is to obtain information about the factors that influence MSMES's intention to adopt cloud based accounting software. We conducted hypothesis testing to find answers to the following research questions:

1. Does technology factors influence adoption intention of cloud-based accounting software in MSME?
2. Does organization factors influence adoption intention of cloud-based accounting software in MSME?
3. Does environment factors influence adoption intention of cloud-based accounting software in MSME?
4. Does individual factors influence adoption intention of cloud-based accounting software in MSME?

2 LITERATURE REVIEW

2.1 Diffusion of Innovation Theory

Diffusion of Innovation (DOI) theory helps explain the adoption of innovative and emerging technologies at an individual or organization level [13]. In innovative or technology adoption, Rogers states that there are 2 factors, adoption intention and adoption behaviour. Adoption intention refers to the phase where potential adopter gains knowledge on the technology or innovation, builds an opinion towards the technology or innovation, and decide whether they want to adopt the technology or innovation, while adoption behavior refers to the phase where adopters implement the technology or adoption and reconsider several things regarding the innovation or technology based on their experience of using it [14]. During the adoption intention, potential adopter will also identify the characteristics of innovation or technology such as relative advantage, compatibility, complexity, observable, and trial able [15].

While Rogers DOI theory is widely used on technology adoption research, this theory alone cannot explain how an organization adopts a technology, therefore the TOE framework will also be used. This framework is said to derive from the DOI theory therefore it is consistent with the DOI theory. TOE Framework considers both internal and external factors of organization that affects technology adoption. The framework was developed by [10] to better understand the adoption level of product and service of Information System (IS) and Information Technology (IT) in an organization. This framework considers three main factors affecting adoption which are technology, organization, and environment factors [16], [17].

2.2 Cloud-based Accounting Software

Cloud-based accounting software is a form of SaaS (Software as a Service) cloud service model where it is able to perform accounting duties via internet. Cloud-based accounting software is defined as an online accounting system that process and generate financial data from users to remote server owned by the provider which is not limited to one location. In this model, the provider is responsible of all the infrastructure they provided [18]. This technology is a platform that facilitates recording, reconciliation, and generating financial statement that can accessed real time. The usage of this technology enables efficiency in workers where they no longer have to do administrative tasks. Financial statement generated from this technology is in accordance with SAK-ETAP, an active accounting standard for entities with no public obligations such as MSMEs [19]. Cloud-based accounting software also opts a pay-per-use model where users only need to pay what they choose to use, this creates a variety of price point MSME's could choose from [20]. Real time data processing allows users to work anywhere and anytime enabling a more flexible and dynamic work rhythm [21].

2.3 Effect of Technology Factors on Adoption Intention of Cloud-based Accounting Software in MSME

Technology factors are all internal and external related technology factors and how the technology affects the adoption intention [22]. Based on previous research on technology adoption, the technology factors will be Rogers' innovation characteristics which are relative advantage, compatibility, and complexity. Among the five characteristics, these three are the most used and the most consistent [23], [19]. Relative advantage refers to how far the innovation or technology is better than previous ones. In the case of cloud-based accounting software, relative advantage refers to the ability to produce financial data in real-time, improve quality of financial information produced, and reduce time needed in accounting process [24]. Compatibility refers to how consistent or capable the technology is with the adopter's side. In this research compatibility refers to if cloud-based accounting software is compatible with MSME's needs [25]. Complexity refers to how far the technology is deemed easy to use. In this research complexity refers to if cloud-based accounting software is easy to then the adoption intention will increase [16].

H1: Technology factors influence adoption intention of cloud-based accounting software in MSME

2.4 Effect of Organization Factors on Adoption Intention of Cloud-based Accounting Software in MSME

Organization factors are all organization resources needed to use and support the adoption of innovation or technology. In this research organization factors include top management support and adequate resources [26]. Top management support refers to the involvement and support of top management towards the adoption of technology. In MSME top management refers to the owner/manager, due to their high influence, if the owner/manager is supportive towards technology adoption then the business will be more likely to allocate their resources to technology adoption [27]. Adequate resources refer to the necessary tools needed to operate and adopt the technology such as budget, hardware, and human resources [23]. Human resources in this research is accounting personnel because in order to use a technology or innovation optimally the user needs to have an adequate knowledge on the technology or innovation. Since the technology an emerging technology in the field of accounting, therefore an accounting personnel is needed [28].

H2: Organization factors influence adoption intention of cloud-based accounting software in MSME

2.5 Effect of Environment Factors on Adoption Intention of Cloud-based Accounting Software in MSME

Environment factors are external factors from market, government, and other related parties that supports or hinder technology adoption. In this research environment factors refers to competitive pressure and regulatory environment [22].

Competitive pressure is how competitors' action and existence create pressure to the business. In this research competitive pressure refers to whether technology adoption by competitor affects technology adoption intention and whether competitive advantage generated from technology usage could affect technology adoption intention [27]. Regulatory environment refers to rules created by related parties that supports or hinders technology adoption. In this research regulatory environment consists of support from the government and rules created by financial institutions [23].

H3: Environment factors influence adoption intention of cloud-based accounting software in MSME

2.5 Effect of Individual Factors on Adoption Intention of Cloud-based Accounting Software in MSME

Individual factor is an extension factor in the TOE Framework, it is used to provide better understanding in cloud-based accounting software adoption intention in MSME. In MSME, owner/manager is still in charge of most business activities therefore in determining technology adoption it is important to consider how their individual factors affect the decision [24]. In this research individual factors refers to owner/managers innovativeness, technology knowledge, and accounting knowledge. Owner/manager's innovativeness is considered because in technology adoption a user is required to get to know the technology better and cloud-based accounting software is an emerging technology in the accounting field more so in MSME level. Therefore, if the owner/manager is innovative then they would be more likely to try out new technology as a solution to gain competitive advantage. In adopting technology it is also necessary to have knowledge over the technology in order to use it optimally therefore, this research considers owner/manager's knowledge of technology and accounting [20].

H4: Individual factors influence adoption intention of cloud-based accounting software in MSME

We present research framework in figure 1

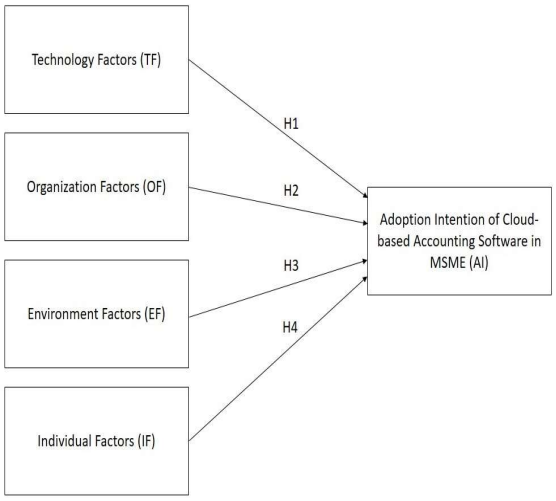

Figure 1 Research Framework

3 RESEARCH METHODOLOGY

This research uses descriptive quantitative method where the research aims to explain the effects or influence of technology, organization, environment, and individual factors towards adoption intention of cloud-based accounting software in MSME statistically. In determining the sample size, Slovin formula was used resulting in 100 data samples required. Samples are determined using the nonprobability, purposive sampling method due to certain criteria that respondents need to have. The criteria are respondents need to be an owner/manager of micro enterprises in Tangerang Regency area, micro enterprise has already been established for more than 1 year, perform accounting activities such as recording, have not used cloud-based accounting software, and is in accordance of micro enterprise criteria based on UU No. 20 tahun 2008.

Data was collected using online surveys which was distributed through social media such as Instagram, Line, and Whatsapp. The online survey uses 6-point Likert scale as the answer options. This research uses 6-point Likert scale because it reduces the possibility of ambiguity in answers that falls neither on agree nor not agree. Previous research on technology adoption have also used the even point Likert scale [29], [30]. Data will be processed using SPSS version 25 where survey will be tested for its validity and reliability. This research uses multiple linear regression model as the output therefore the data will need to be tested for classic assumptions. The tests include normality, multicollinearity, and heteroscedasticity test. If the data is clear of any classic assumptions, hypothesis testing will be

performed. The hypothesis testing includes F, R^2, and t-test.

In this study, there are 4 independent variables (X) and 1 dependent variable (Y), where the independent variables are technology (X1), organization (X2), environment (X3), and individual (X4), while the dependent variable studied is intention to adopt cloud-based accounting software in SMEs (Y). The measurement of each variable is as in Table 1:

Table 1 Operation of Variables

Operation of Variables		
Variable	**Main indicator**	**Source**
Technology Factors(TF)	*1. Able to present real-time data* *2. Time efficiency in accounting process* *3. Improve quality of financial information* *4. In accordance with need of MSME* *5. Cloud-based accounting is easy to use*	[20], [19].
Organization Factors (OF)	*1. Support from owner/manager* *2. Commitment from owner/manager* *3. Prepare hardware and tools* *4. Availability of accounting staff* *5. Need to prepare budget*	[23]
Environment Factors(EF)	*1. If able to provide better profit* *2. If competitor also used* *3. If there is government support* *4. If creditor mandatory use of accounting software*	[23], [31]j
Individual Factors (IF)	*1. Up to date with innovation technology* *2. Tried existing innovation* *3. Willing to applied technology in business* *4. Knowledge in information technology* *5. Able to applied technology in business* *6. Skill and knowledge in accounting* *7. Able to applied accounting in business*	[16], [20]
Adoption Intention of Cloud-based Accounting Software in MSME (AI)	*1. Recording or bookkeeping function* *2. Produce financial statement according to IFRS for SME* *3. Support decision making* *4. Interested in cloud-based accounting software* *5. Plan to adopt cloud-based accounting software*	[31]

4 RESEARCH RESULT

4.1 Respondent Demographic Information

This research manages to collect 113 respondent data but only 104 was used for the research due to incomplete respondents answer. The

respondent of this research consists mainly of micro enterprise owners, with 1-3 years of establishment, and mostly the food and beverage business. Table 2 depicts the respondent demographic information.

Table 2 Respondent Demographic Information

Position			Field
Owner	75	Food and beverage	42
Co-owner	21	Fashion	9
Manager	8	Automotive	4
Age of business		Tour and travel	4
1-3 years	54	Handicraft	13
3-5 years	17	Electronic	4
> 5 years	33	Beauty	2
		Law	1
		Accounting	3
		Stationary	4
		Delivery	1
		Other	17

4.2 Validity Test using Pearson Correlation

Validity test is a test used to show the extent to which the measuring instrument used in a measure measures what is being measured. [32] states that the validity test is used to measure the legitimacy or validity of a questionnaire. The validity test was carried out using the Pearson correlation formula which correlated each item score with the total score. The research item/question is declared valid if the r-arithmetic is greater than the r-table. The number of samples used in this study was 104 with a significance level of 1% so that the r-table value was 0.252. The following table 3 are the results of the validity test of 26 research questions:

Table 3 R-Arithmetic

Indicator	R-arithmetic	Indicator	R-arithmetic
TF1	0.667	EF4	0.547
TF2	0.591	IF1	0.579
TF3	0.582	IF2	0.551
TF4	0.547	IF3	0.598
TF5	0.628	IF4	0.568
OF1	0.604	IF5	0.625
OF2	0.610	IF6	0.567
OF3	0.600	IF7	0.596
OF4	0.363	AI1	0.698
OF5	0.450	AI2	0.712
EF1	0.621	AI3	0.656
EF2	0.485	AI4	0.697
EF3	0.500	AI5	0.679

Based on the data in Table 3, the r-arithmetic value of each research item/question is greater than the r-Table so that the data collection instrument is declared valid and can be used for the next step.

4.3 Reliability Test

The reliability test was carried out by looking at the value of Cronbach's Alpha total items for each variable on the data collection instrument. The instrument is declared reliable if the Cronbach's Alpha value is more than 0.60. The following Table 4 is the result of the reliability test of the data collection instrument with a total of 104 samples.

Table 4 Cronbach's Alpha

Variable	Cronbach's Alpha
Technology Factors	0.805
Organization Factors	0.705
Environment Factors	0.712
Individual Factors	0.852
Adoption Intention of Cloud-based Accounting Software in MSME	0.875

4.4 Result of Coefficient Determination

The coefficient of multiple determination (R^2) is the coefficient of determination that is used to explain the relationship of the independent variables together to the dependent variable which is explained through the multiple regression model. A small R2 value indicates the ability to explain the independent variable to the dependent variable is low. The following table 5 is the result of the coefficient of determination R^2.

Table 5 Coefficient Determination

Variable	R Square	Adjusted R Square
Adoption Intention of Cloud-based Accounting Software in MSME	0.607	0.591

Based on the data in Table 5, it is found that the R^2 value is 0.591, this means that the technology, organization, environment, and individual variables together have an effect on the variable of intention to adopt cloud-based accounting in MSMEs by 59.1%, while the difference from the percentage is 40.9% (100% - 59,1%) influenced by other variables not examined.

4.5 Simultaneous F Test

In this study, the F test was carried out to see whether the variables of technology, organization, environment, and individual together had an effect

on the variable of intention to adopt cloud-based accounting software in MSMEs. The independent variables jointly affect the dependent variable if the value of Sig. smaller than 0.05 or the F-Count value is greater than the F-Table value, which is 2.46. The following table 6 is the result of the F test.

Table 6 Coefficient of Determination

Variable	R Square	Adjusted R Square
Fin-tech Forensic	0.458	0.445

Based on the results of the data in Table 6, the F-arithmetic value found is greater than the F-Table, namely 38.235 > 2.46. Value of Sig. which is found to be smaller than 0.05, which is 0.000, so it can be stated that in this study, technology, organization, environment, and individual variables together affect the variable of intention to adopt cloud-based accounting software in MSMEs.

4.6 Hypothesis t Test

T test was conducted to see the effect of each independent variable on the dependent variable. In this study, a T-test was conducted to see the effect of technology, organization, environment, and individual partially or individually on the variable of intention to adopt cloud-based accounting software in SMEs. The following table 7 is the result of the T test.

Table 7 Hypothesis T Test

Hypothesis	Coefficient	T statistic	p-value sig.
TF →AI	0.562	6.518	0.000
OF →AI	0.137	1.565	0.121
EF →AI	0.281	2.786	0.006
IF →AI	0.008	1.404	0.163

Based on the data in table 7, found the values of T and Sig. each independent variable. In this study, the independent variable is declared to have an effect on the dependent variable partially if the value of Sig. smaller than 0.05 or the t-count value is greater than the t-table, which is 1.984 (df=104).

The independent variable technology factors has a t-arithmetic which is greater than the t-table, namely 6.518 > 1.984 and the value of Sig. which is smaller than 0.05, which is 0.000, so the first hypothesis or Ha1 is accepted and H0 is rejected. Ha1 states that the technology variable partially has an influence on the variable of intention to adopt cloud-based accounting software in MSMEs.

The independent variable organization factors has a t-arithmetic which is smaller than the t-table, which is 1.565 < 1.984 and the value of Sig. which is greater than 0.05 is 0.121, so H0 is accepted and Ha2 is rejected. H0 states that the organization variable partially has no effect on the variable of intention to adopt cloud-based accounting software in MSMEs.

The environment independent variable has a t-arithmetic which is greater than t-table, namely 2.786 > 1.984 and the value of Sig. which is smaller than 0.05 is 0.006, so Ha3 is accepted and H0 is rejected. Ha3 states that the environment variable partially has an influence on the variable of intention to adopt cloud-based accounting software in MSMEs.

The individual independent variable has a t-arithmetic which is smaller than the t-table, namely 1.404 < 1.984 and the value of Sig. which is greater than 0.05 is 0.163, so H0 is accepted and Ha4 is rejected. H0 states that the individual variables partially have no effect on the variable of intention to adopt cloud-based accounting software in MSMEs.

4.7 Discussion

According to the hypothesis testing result, reducing time required during accounting process is possible because cloud-based accounting software could easily be integrated with the business's POS system so there is no need to do record sales manually. This technology also stores all financial data digitally via cloud, users have ease of access where they can use the search engine to find the designated data. Since data is also stored digitally there is no fear in losing paperwork since everything is stored in digital [20].

When cloud-based accounting software is compatible with the needs of MSME the adoption intention will increase. Cloud-based accounting software is best suited for MSME where they still have a simple infrastructure [20]. If cloud-based accounting software is easy to use, then the adoption intention will also increase. For MSME who have limited resources and specialized knowledge, it is beneficial if the technology is easy to use [24]. This result is in line with most research that states that technology factors affect technology adoption intention [23], [16].

Adequate resources refer to the resources needed to optimally use cloud-based accounting software. Micro enterprise still depends on personal funding, therefore it is not as easy to spend their limited resources on new and unsure investment such as cloud-based accounting software [33]. Specialized worker, in this case, accounting staff is viewed as something that is not substantial to technology adoption. They prefer to receive training so they could learn how to use the technology in comparison to hire a specialized worker [17]. This result contrasted some research but is in line with research that states that organization factors does not influence adoption intention directly or significantly [20].

Regulatory environment such as government support and rules established by financial institution greatly affects MSMEs decision adopt technology. MSME especially micro enterprise still relies heavily on government support. Therefore, if the government supports technology adoption and create supporting program through training, seminar, incentives, and others, adoption intention will increase [34]. Rules set by financial institutions greatly affects how micro enterprises will intent to adopt technology. If financial institutions states that financial statement in accordance with accounting standard is needed for lending process, then adoption intention of cloud-based accounting software will increase [35]. This result is in line with prior research that states environment factors influence technology adoption intention [23], [16].

Owner/manager of micro enterprise have limited specialized knowledge. They also lack awareness on how important it is to have specialized knowledge. The lack of knowledge may result in owner/manager not knowing fully how technology utilization especially accounting technology could help their business grow [36]. This indicates that the level of knowledge of technology and accounting is still low in micro enterprises.

5 CONCLUSION AND SUGGESTION

This quantitative descriptive research study the effect of technology, organization, environment, and individual factors towards adoption intention of cloud-based accounting software in MSMEs. This study concluded that technology and environment factors affect or influence adoption intention of cloud-based accounting software in MSME. Technology factors such as relative advantage, compatibility, and complexity influence adoption intention. This implies that technological benefits greatly affect adoption intention in micro enterprises. Environment factors such as competitive pressure and regulatory environment influence adoption intention. This result support previous study in [37], [38]. This implies that competition in marketplace and external parties affect adoption intention in micro enterprise.

This study also finds that organization and individual factors do not influence adoption intention of cloud-based accounting software in MSMEs. Organization factors such as top management support and adequate resources do not influence adoption intention. Since micro enterprise relies heavily on personal funding, they are reluctant to spend their limited resource on new and unsure technology. Individual factors such as owner/manager innovativeness, technology knowledge, and accounting knowledge do not influence adoption intention of cloud-based accounting software in MSMEs. This implies that the level and awareness of innovation, technology, and accounting in micro enterprise is still low.

We acknowledge several limitations in this study. First, the topic of cloud-based accounting software is highly specific and new resulting in limited specific references. Second, the target respondent of this research is micro enterprise owner/manager, they have difficulties in finishing the online survey resulting in the data not being recorded. Some of them are not familiar with online survey. In order to minimize this problem, we also spread the questionnaire by approaching our respondent directly onsite. We help the micro enterprise owner/manager who experience difficulties directly which we approach onsite. Third this research focuses only on MSME located in Tangerang regency Area. Further study should expand the scope area of research object.

Future research could consider targeting owner/manager of micro enterprise that have a non-conventional or developed way of thinking. Using more locations can also provide a new insight.

Future research can also study how the indicators affect adoption intention.

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