

Conference Paper

Why Should MSMEs Adopt Accounting Application with Cloud Computing? The Reality of MSMEs in Depok, West Java

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Abstract

The implementation of accounting application to MSMEs requires large investments while MSMEs have limited resources. Cloud computing technology is one way to help MSMEs in applying accounting applications in the company. This study aims to examine the perceptions and intentions of MSMEs on factors that affect the use of cloud computing such as cost reduction, ease of use, reliability, sharing and collaboration, security and privacy, and its effect on the adoption of accounting application. The samples are taken from 30 MSMEs listed in Depok City Office in the year of 2012. Samples were chosen based on purposive sampling with the criteria of being registered in Depok City Office and having business capital above 50 million. The research method used is quantitative with multiple linear regression. The results showed that factors such as ease of use, reliability, sharing and collaboration as well as security and privacy affect the intension and adoption of accounting application with cloud computing by MSMEs. However, cost reduction do not have significant impact on intension and adoption of accounting application by MSMEs in the region of Depok.

Keywords: cloud computing, micro, small and medium enterprise (MSMEs), accounting applications, Software as a Service (SaaS), Platform as a Service (PaaS), Infrastructure as a Service (IaaS)

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1. Introduction

Micro, Small and Medium Enterprises (MSMEs) play a major role in the economic growth of the state of Indonesia. Data at Statistics Indonesia (previously, Central Bureau of Statistics –BPS) shows the fact that most of the business players in this country are MSMEs and accounted for about 59.08% of Indonesia's Gross Domestic Product (GDP) in 2012. The big role of MSMEs to the economy of the country is expected to continue to increase despite the ASEAN economic community (MEA)

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has been enacted as of December 31, 2015. It is expected that Indonesian MSMEs able to compete in the free market.

MSMEs in Indonesia have a large contribution to the economy of the country. Most of small businesses have an inherent competitive weakness due to their comparative inability to access and use business information. MSMEs need accounting application in order to obtain business information (accounting information). Accounting information is the output of the accounting information system. Accounting applications are used as software for accounting information systems. It is required a very expensive cost to implement the application while MSMEs have limited resources in terms of number of workers, capital and infrastructure. Therefore it is necessary to have facilities that can help applying accounting applications in MSMEs in order to become cheaper and easier. The use of cloud computing technology in accounting applications for MSMEs can be the right solution.

Cloud computing is a parallel and distributed system consists of a collection of computers with virtualization that provides all the computing resources through a service level agreement between the service provider/vendor and the consumer. Cloud computing models provide a variety of computing resources so that development with innovative ideas for new internet services no longer requires huge capital expenditures for hardware, application purchase costs and human costs to operate them. All capital expenditures are provided by the service provider/vendor.

Research conducted by Clark (2009) stated that security, reliability, trust, cost reduction, online collaboration are the main key for the use of cloud computing. Martin (2010) mentioned that as many as 51% of small and medium enterprises have concerns on security and privacy issues, availability versus sudden downtime, and migration across cloud services. He also suggested that it is important for MSMEs to move and use cloud computing.

According to Gupta et al. (2013), the perception of micro small and medium enterprises (MMSMEs) in different geographical regions is different. For example, European companies have different behaviors compared to companies in the US and Asia. A study by TCS (Tata Consultancy Services, India) on cloud computing, the United States and Europe lags behind in the adoption of cloud computing. On the other hand, companies in Latin America and companies in Asia-Pacific are the most aggressive adopters of cloud computing. Cloud computing has become a key word in the industry today. Although not a completely new concept, but in the digital age now, it's happening everywhere because of the development of internet, broadband, mobile devices, bandwidth and mobility better requirements for end users.

There are several benefits to be gained from implementing cloud computing. The first is *the ease*. Because what the user needs is to use the application instead of installing it, then with a cloud computing model a user only needs to register on a server and within a short time the desired application is readily available and accessible. The second benefit is *scalability*. When a small company needs an accounting application, what is needed is a simple and easy application with a less intensive use. By the development of companies, the use of accounting applications will be more intensive. In terms of price, a small company is certainly only able to buy inexpensive application, while large companies no longer think about costs, but benefits. With the implementation of accounting applications using cloud computing on MSMEs, it is expected that MSMEs can concentrate on the core business so that the MSMEs become more productive and have a competitive advantage. Gupta (2013) also mentions that there are 5 important variables to adopt cloud computing by MSMEs, namely: cost reduction, ease of use, reliability, sharing and collaboration and security and privacy.

The discussion about benefits of cloud computing for accounting application for MSMEs in this article formulates the question: What are the perceptions and intentions of MSMEs in the region of Depok against the benefits of using accounting applications with cloud computing? Does the use of accounting applications with cloud computing affect MSMEs' decision to adopt this technology?

This study used quantitative methods to examine the perceptions and intentions of MSMEs against the benefits of using accounting applications with cloud computing technology and to know the effect of the benefits that can be derived from the use of accounting applications with cloud computing to SME decisions to adopt this technology. The results are expected to provide scientific reference for software developers in building accounting software for MSMEs and encourage the creation of accounting applications in accordance with the needs of MSMEs which is the ultimate goal of this study.

2. Theoretical Review

2.1. Micro, small and medium enterprises

Small and Medium Enterprises (MSMEs) have a big role in the economic growth of Indonesia. According to Statistics Indonesia, SMEs in Indonesia contribute more than 55% of Indonesia's Gross Domestic Product (GDP).

The definition of MSMEs in Indonesia refers to Law No. 20 year of 2008. The criteria of SMEs according to this law are as follows. Micro industry is enterprise which have net assets up to 50 million rupiah or have annual revenue from sales up to 300 million rupiah. Small industry is enterprise which have net assets over 50 million rupiah to 500 million rupiah or have annual revenue from sales over 300 million rupiah to 2.5 billion rupiah. And medium industry is enterprise which have net assets over 500 million rupiah to 10 billion rupiah or have annual revenue from sales more than 2.5 billion rupiah to 50 billion rupiah.

TABLE 1: Definition of MSMEs in Indonesia.

Type of Enterprise	Criteria	
	Asset (Rupiah)	Revenue (Rupiah)
Micro	< 50 million	300 million
Small	> 50 million–500 million	300 million–2.5 billion
Medium	> 500 million–10 billion	2.5 billion–50 billion

Source: Law No. 20 Year of 2008.

2.2. Cloud computing

According to Rajkumar (2013), the term cloud computing refers to companies and users who can access applications from anywhere on demand. Cloud computing provides the infrastructure, platform and application software as services that are available as a subscription-based service with pay-as-you-go models for customers. In general there are three main services offered, namely infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS).

The following researchers such as Mahesh et al. (2011), Sultan (2011), Truong and Dustdar (2011), Ojala and Tyrvaïnen (2011), Creeger (2009), Li et al. (2011), Durkee (2010), Marston, Li, Bandyopadhyay, Zhang, and Ghalsasi (2011), Karadsheh (2012), Rath (2012), Neves, Marta, Correia, and de Castro (2011) and McAfee (2011) in Gupta (2013) observes that cloud computing consists of three services, namely:

1. *Software-as-a-Service (SaaS)*: Applications such as word processing, CRM (Customer Relationship Management), ERP (Enterprise Resource Planning) are made available (Host) over the internet for use by end users. This can achieve economies of scale. The users do not need to install software on client machine and update it with regular patches.

2. *Platform-as-a-Service (PaaS)*: platforms and software development kits as well as tools (such as Java,.NET, Python, Ruby on rails) are made available over the Internet. The users do not need to purchase software licenses for platforms such as operating systems, databases and middleware.
3. *Infrastructure-as-a-Service (IaaS)*: this refers to real physical devices such as virtual computers, servers, storage devices, network transfers, physically located in one central place (data center) They can be accessed and used over the internet using a login authentication system and password from any dumb terminal or device.

2.3. Accounting information system

Accounting information system is a system that processes various financial transactions and non-financial transactions, which directly affect the processing of financial transactions. There are 3 subsystems in accounting information system (AIS): firstly, transaction processing system (TPS) that supports daily business operations through various documents; secondly, a general ledger (GL)/financial reporting (FRS) system, which results in financial statements, balance sheets, income statement, cash flow, and so on. FRS communicates the financial information required by external users; and finally, management reporting system, which provides financial statements for internal management in decision-making, such as budget, performance reports, and accountability reports [11].

A lot of research has been done on accounting information system. One of them is the research conducted by Fitriyah (2006) which stated that accounting information generated by accounting information system is required by the company management in formulating various decisions in solving problems faced by the company. Meanwhile, Rosita (2013) stated that accounting information system has a very important role in the small- and large-scale entities. AIS is the development of information technology to address issues in the entities related to business management, control and supervision. AIS can be used as information providers intended for users of financial statements for decision-making needs. AIS produces reliable, relevant, timely, understandable, and truth-tested financial information to assist in the process of making economic decisions.

2.4. Perception

According to Ciccarelli and Meyer in Giatrininggar (2012), perception is a method drawn from the individual who takes all the sensations of an event and then the individual interprets the sensation. Kotler (1995) states that perception is how the process undertaken to select, organize, and interpret the inputs of information by a person to form a meaningful picture as a whole. Whereas according to a complete Dictionary of psychology, perception is the process of knowing, knowing the object through the help of the senses [4].

2.5. Perception of small entrepreneur on accounting information

Pinasti (2001) states that according to small entrepreneur, accounting information and accounting records are just a troublesome. The most important thing for small entrepreneurs is that they can earn profits without having to carry out accounting records because they do not find the usefulness of the accounting information. In line with this, Idrus (2000) states that for small entrepreneurs accounting is difficult to do. Accounting process is not important to apply to their business, and the most important is the way to generate profit without having to be bothered with the implementation of accounting records. Profit are considered good if greater than the profit gained from the previous period. In fact, to measure success is not only by measuring income but also measuring transactions/activities occurred, classifying and summarizing these transactions (organization of accounting information).

3. Methodology

Research design used in this research is quantitative method. Quantitative research method is a research method based on positivism philosophy, used to examine the population or a particular sample (Sugiyono, 2012). Sampling techniques on quantitative methods are generally done randomly, data collection using research instruments, data analysis is quantitative/statistical with the aim to test the hypothesis that has been set. This research is empirical research using data from UMKM Center Depok.

Questionnaires are used to collect formal data from MSMEs. Samples were chosen based on purposive sampling with the criteria listed in Depok City Office in 2012 and have capital above 50 million rupiah. The collected sample size was 30 from September to November 2016.

Data collected from the final survey was analyzed. For statistical analysis, SPSS version 17 was used to build, run and validate the process model. Multiple linear regression techniques were used to analyze the constructs.

3.1. Research variables and hypothesis formulation

In this study the variables used as independent variables are:

3.1.1. Cost reductions

Companies use IT infrastructure with Pay-per-Use-On-Demand mode so that small companies can save huge costs [16]. By providing control to third parties over the IT infrastructure the company can help reduce capital expenditure and at the same time maximizing asset utilization to provide quantitative Return on Investment (RoI) so that eliminating the costs associated with providing the equipment needed to build the infrastructure [27]. The entry fee for small companies in utilizing business analysis that requires a lot of computing power, has been lowered. IaaS adoption reduces the cost of capital and IT costs [29].

Cost reductions will be measured on a Likert scale, respondents will be given answers in the form of statements scored from 1 to 4, provided that: Strongly Disagree = 1, Disagree = 2, Agree = 3, and Strongly Agree = 4.

Based on this the following hypotheses are made:

H1: Cost reduction positively affect the adoption of accounting applications by using cloud computing.

3.1.2. Ease of use

Cloud computing approach helps eliminate administrative overhead and access permissions from any geographic location, any device, and from any organization [20]. Ease of use will be measured on a Likert scale, respondents will be given answers in the form of statements scored from 1 to 4, provided that: Strongly Disagree = 1, Disagree = 2, Agree = 3, and Strongly Agree = 4.

Based on this the following hypotheses are made:

H2: Ease of use positively affect the adoption of accounting applications by using cloud computing

3.1.3. Reliability

Cloud computing services are available all the time, it is becoming more reliable. Employees can call a cloud computing center (if needed) instead of dependent on inhouse IT staff [1]. Data redundancy is built-in with cloud storage solutions so that files are always available, even during times of power failures, network downtime, etc. [6].

Reliability will be measured on a Likert scale, respondents will be given answers in the form of statements scored from 1 to 4, provided that: Strongly Disagree = 1, Disagree = 2, Agree = 3, and Strongly Agree = 4.

Based on this the following hypotheses are made:

H3: Reliability positively affect the adoption of accounting applications by using cloud computing.

3.1.4. Sharing and collaboration

Marston (2011) states by using Google Docs, some people can share and edit the same document at once and also collaboration via Skype or Google chat makes people interested to adopt cloud computing.

Sharing and collaboration will be measured on a Likert scale, respondents will be given answers in the form of statements scored from 1 to 4, provided that: Strongly Disagree = 1, Disagree = 2, Agree = 3, and Strongly Agree = 4.

Based on this the following hypotheses are made:

H4: Sharing and collaboration have a positive effect on the adoption of accounting applications by using cloud computing

3.1.5. Security and privacy

There is an increase in the number of employees who bring their own devices (BYOD) into the workplace because they feel better privacy and data security as well as feel comfortable in accessing the email office rather than using provided devices. This improves employee performance s [5]. System reliability is a direct contribution of security. It is very important to design a secure cloud computing system [3].

Security and privacy will be measured on a Likert scale, respondents will be given answers in the form of statements scored from 1 to 4, provided that: Strongly Disagree = 1, Disagree = 2, Agree = 3, and Strongly Agree = 4.

Based on this the following hypotheses are made:

H5: Security and privacy have a positive effect on the adoption of accounting applications by using cloud computing

Dependent variable for this study is *adoption of accounting applications with cloud computing*. According to Davis in Suardhika (2013), technology is called successful if acceptable which is characterized by a desire to use and leads to use.

Adoption of accounting applications with cloud computing will be measured on a Likert scale, respondents will be given answers in the form of statements scored from 1 to 4, provided that: Strongly Disagree = 1, Disagree = 2, Agree = 3, and Strongly Agree = 4.

Based on this the following hypotheses are made:

H5: Security and privacy have a positive effect on the adoption of accounting applications by using cloud computing

The model for this study can be described as follows.

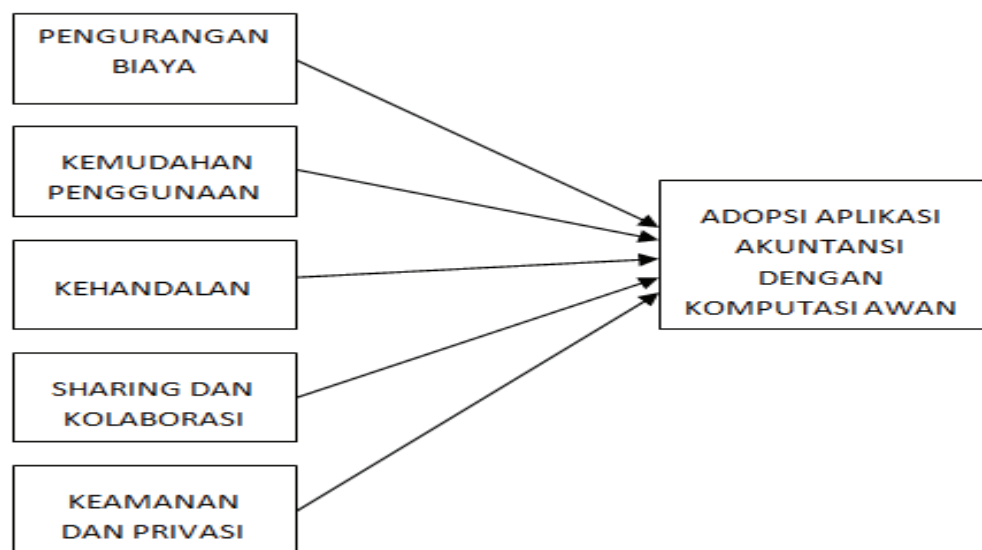


Figure 1: Research model.

The benefit of using accounting application with cloud computing technology for MSMEs that investigated in this research adopting the work of Gupta which comprises

of 5 benefits, namely: cost reduction, ease of use, reliability, sharing and collaboration, security and privacy, and its effect on the adoption of accounting application.

Table 2 shows these benefits and their respective number of questions.

TABLE 2: Questionnaire structures.

Code	Category	#Questions
A1-A3	Use and adoption of cloud computing	3
B4-B7	Cost reductions	4
C8-C11	Ease of use	4
D9-D12	Reliability	5
E17-E20	Sharing and collaboration	4
F21-F23	Security and privacy	3
	Total	23

4. Results and Discussion

4.1. Respondents

Total respondent for this study is 30 MSMEs. Total respondent for this study is 30 MSMEs. The compositions are 20 MSMEs (67%) has revenue below 300 million rupiah and 10 MSMEs (33%) has revenue from 2.5 billion rupiah up to 50 billion rupiah.

4.2. Validity and reliability test

Validity and reliability test of the questionnaire is required to determine the quality of the data. Validity and reliability in this study are examined using Statistical Package for the Social Sciences (SPSS) version 17.

Based on the calculation of validity with factor analysis it can be seen that all the indicators in each dimension in this study variable is valid because Kaiser-Meyer-Olkin value (KMO) is greater than 0.5 with significance below 0.05.

In this study all data can be categorized as reliable because the value of alpha Cronbach is above 0.6.

From data obtained, firstly, determined the factors that influence the adoption of cloud computing by SMEs. From previous research conducted by Gupta (2013), it is

TABLE 3: Validity and reliability test result.

Dimension	Validity		Reliability
	KMO	Bartlett's test of Sphericity	Cronbach's Alpha
Use and adoption of cloud computing	0.657	28.411	0.794
Cost Reductions	0.793	43.551	0.837
Ease of use	0.638	63.787	0.855
Reliability	0.740	152.148	0.932
Sharing and Collaboration	0.790	84.475	0.898
Security and Privacy	0.734	43.318	0.877

known that these factors are cost reduction, ease of use, reliability, sharing and collaboration as well as security and privacy.

Afterward, a *t* test is performed to find the significance of each independent variable. Based on the initial modeling, cost and collaboration sharing variables have a significance value greater than 0.05 so that each variables are one by one is issued and the coefficient changes are seen. If after the variable issued the changes coefficient of another variable more than 10% then the variable remains in the model (removing the independent variable from the largest). The final model obtained after the *F* test is as follows

TABLE 4: ANOVA.

Model		Sum of Squares	df	Mean Square	<i>F</i>	Sig.
1	Regression	15.391	4	3.848	39.544	0.000 ^b
	Residual	2.432	25	0.097		
	Total	17.823	29			

From Table 4, it can be seen that the model is significant because the significance value is 0 (zero). The resulting summary model (Table 5) shows that R square value of 86.4%, meaning that the regression model is able to explain 86.4% of cloud computing variables whilst 13.6% is explained by other variables not yet included in the model.

The assumption test is conducted to test whether the regression model in this study meets the research assumptions. Assumption test result: The assumption test result to find the existence shows that the residual mean is 0,0000 and the standard deviation of 0,289619. The assumption test result to find the independence with Durbin-Watson

TABLE 5: Model summary.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.929 ^a	0.864	0.842	0.311929	2.325

shows the value of 2,325. Although the result is above 2; however, it is still close to the value between -2 to +2, so the assumption is fulfilled. The result of assumption test to find linearity show Sig of 0,00001, the average (mean) linearity assumption fulfilled. The results of normalization tests conducted show that Ho cannot be rejected at a significance level of 5%. It is known from Table 6 that the sig test value Kolmogorov-Smirnov more than 0.05 which means normalcy fulfilled.

TABLE 6: Kolmogorov-Smirnov test result.

		Standardized Residual
N		30
Normal Parameters ^{a,b}	Mean	0E-7
	Std. Deviation	0.92847669
Most Extreme Differences	Absolute	0.140
	Positive	0.079
	Negative	-0.140
Kolmogorov-Smirnov Z		0.765
Asymp. Sig. (2-tailed)		0.602

Thus, this regression model satisfies the assumption of normality. The multicollinearity test results showed no multicollinearity problem in the data. It can be seen in the absence of variance inflation factor value (VIF) more than 10.

Heteroscedasticity test is done with scatterplot graph (Figure 2). Heteroscedasticity test results showed no problems with this study. This is seen in the absence of a clear pattern in the picture, and the spots spread above and below the number 0 on the Y axis. Based on the aforementioned results, it can be concluded that the regression model in this study meets the research assumptions.

After the aforementioned assumption test is fulfilled, it can be compiled research regression equation from the table of hypothesis test results as follows:

$$Y = -0.37 + 0.509X_1 + 0.336X_2 - 0.269X_3 + 0.394X_4 + e.$$

TABLE 7: Multicollinearity test result.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
	B	Std. Error				Beta	Lower Bound	Upper Bound	Tolerance
(Constant)	-0.037	0.271		-0.135	0.893	-0.595	0.521		
Ease of use	0.509	0.150	0.511	3.384	0.002	0.199	0.818	0.240	4.175
Reliability	0.336	0.132	0.353	2.542	0.018	0.064	0.609	0.284	3.527
Sharing collaboration	-0.269	0.160	-0.272	-1.684	0.105	-0.598	0.060	0.209	4.793
Security and privacy	0.394	0.115	0.422	3.419	0.002	0.157	0.632	0.359	2.783

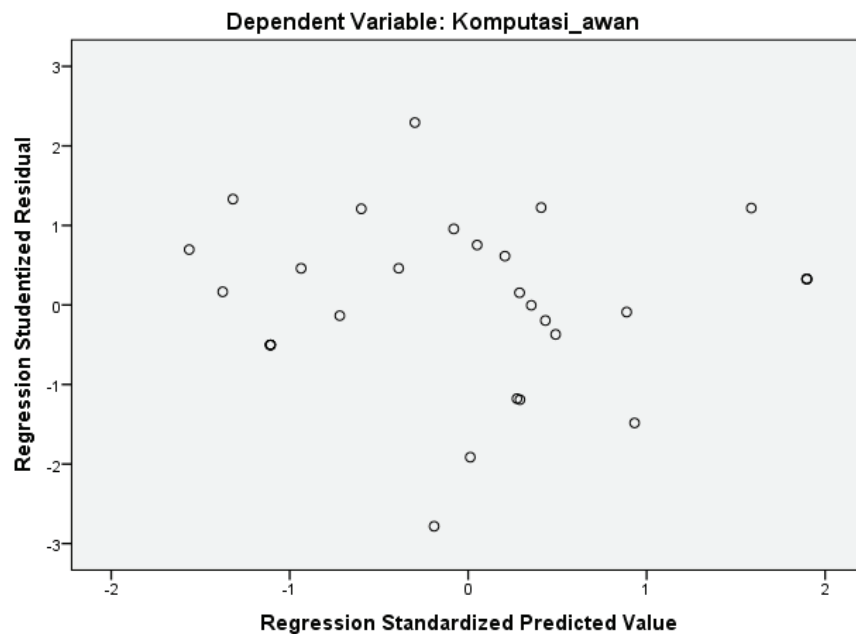


Figure 2: Scatterplot graph.

4.3. Discussion

An important result of this research is that cost reduction is not the most important factor for small businesses (MSMEs) to adopt accounting applications with cloud computing technology. Ease of use, reliability, security and privacy, and sharing and collaboration are considered as top priorities for them to adopt the cloud. This indicates that UMKM is happy to adopt the cloud because it is easy to use, comfort and security and privacy better than to reduce its investment. The results of this study in accordance with the results of research conducted by Gupta (2013).

5. Conclusion

The results of this study indicate that the use of accounting applications with cloud computing technology provides many advantages for MSMEs. Apparently, that cost reduction is not the most important factor for small businesses (MSMEs) to adopt accounting applications with cloud computing technology.

5.1. Recommendations

This study has many limitations that cause the results of the research cannot be generalized well, among others, the number of samples used is still not enough to represent the test of the variables used as a research. Based on this, the suggestions that can be given to the next research is to increase the number of samples. In addition, in the next study may need to include other variables of the benefits of cloud computing so that the results obtained becomes better.

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