THE USAGE OF ONE SINGLE SYSTEM (OSS) WITH CLOUD COMPUTING BASED IN ACADEMIC SERVICE: A TECHNOLOGY ACCEPTANCE MODEL (TAM) APPROACH

Case Study at Study Program Management Faculty of Economics UIN Maulana Malik Ibrahim Malang

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Abstract: The Usage of One Single System (OSS) with Cloud Computing Based in Academic Service: A Technology Acceptance Model (TAM) Approach
Digitalization is important for our life, and higher education is no exception. The process of submitting letters that are still manual needs to be changed to something practical and easy. That is a digital-based letter submission through a website. Therefore, our research aims to develop One Single System (OSS) based on Web Cloud Computing to improve the performance of management study program services with the Technology Acceptance Model (TAM) approach. This is done to support the accreditation process that is periodically carried out by the study program. This research uses quantitative methods with a descriptive approach. Our respondents are active students of the Management Study Program at UIN Maulana Malik Ibrahim Malang. For data analysis, we used structural equation model analysis to test the constructs we used (perceived security, perceived usefulness, perceived of use, intention to use actual usage). The results of our research show that the perceived security, effect of perceived usefulness, perceived ease of use on intention to use in ACCESS users and intention to use on acceptance of ACCESS. The existence of the system makes it safe, faster and easier to use, so that many students intend to use and accept the existence of our system, ACCESS.

Keywords: One Single System (OSS), Web Cloud Computing, Technology Acceptance Model (TAM), Academic Services

Abstrak: Penggunaan One Single System (OSS) Berbasis Cloud Computing dalam Layanan Akademik: Pendekatan Technology Acceptance Model (TAM)
Digitalisasi penting bagi semua lini kehidupan, tidak terkecuali perguruan tinggi. Proses pengajuan surat yang masih manual perlu diubah dengan sesuatu yang praktis dan mudah, yaitu pengajuan surat yang berbasis digital melalui suatu website. Oleh karenanya, penelitian kami bertujuan untuk melakukan pengembangan One Single Sistem (OSS) berbasis pada Web Cloud Computing untuk meningkatkan kinerja layanan Program Studi Manajemen dengan pendekatan Technology Acceptance Model (TAM). Hal ini dilakukan untuk mendukung proses akreditasi yang secara periodik dilakukan

oleh program studi. Penelitian ini menggunakan metode kuantitatif dengan pendekatan deskriptif. Responden kami adalah mahasiswa aktif Program Studi Manajemen pada UIN Maulana Malik Ibrahim Malang. Untuk analisis data, kami menggunakan analisis SEM untuk menguji konstruk yang kami gunakan (perceived security, perceived usefulness, perceived of use, intention to use actual usage). Hasil penelitian kami menunjukkan bahwa persepsi keamanan, pengaruh persepsi kegunaan, persepsi kemudahan penggunaan terhadap niat menggunakan pada pengguna ACCESS dan niat menggunakan terhadap penerimaan ACCESS. Adanya sistem tersebut membuat aman, lebih cepat dan mudah digunakan. Sehingga banyak mahasiswa yang berniat menggunakan dan menerima keberadaan sistem ACCESS.

Kata Kunci: One Single System (OSS), Web Cloud Computing, Technology Acceptance Model (TAM), *Layanan Akademik*

INTRODUCTION

Digitalization is the process of changing from analog technology to digital technology. The current process is that industries are increasingly modernizing and relying on these technologies to sustain their operations. Digitalization in higher education has become something that is not negotiable, but a necessity for organizations that are committed to sustainable growth. The implementation of digitalization has the impact of not only increasing the effectiveness of employee work productivity, but also has the potential for cost efficiency. Higher education with the tagline world class university, where campuses in Indonesia must be able to compete with universities in developed countries and be internationally accredited. The implementation of digitalization is one of various efforts to improve good university governance (Sari *et al*., 2020; Shah, 2014).

Several previous studies have shown that the use of information technology has a positive impact and increases effectiveness in work, especially in educational institutions (Priyadarshine et al., 2017; Shah, 2014; Yang et al., 2021). The system in higher education is divided into 2 processes, namely the main process and the supporting process. The main process starts from the registration of new student candidates, the implementation of the *tri dharma* of higher education (education & teaching, research, community service), student and alumni development, and networking and cooperation. No less important are the processes that support the implementation of the main processes above.

Study program (hereinafter referred to as *prodi*) as the main actor in the development of educational institutions. Prodi is required to carry out continuous accreditation activities to maintain the path to the vision and mission of the university. To carry out good and quality accreditation and achieve high quantity, the study program must have a variety of skills, expertise and breadth of knowledge. With high ability capital, it is expected to encourage universities to compete in a broader scope. Sari et al., (2020) state that one of the ideal information

technologies for universities is to adopt Web Cloud Computing. The adoption of Cloud Computing is divided into technology and information solutions that are more practical and economical through software as a service, platform as a service, and infrastructure as a service content. It is intended to overcome academic challenges related to cost and administrative constraints. It is proven that the adoption of cloud computing has an influence on service performance, in this case, the study program (Priyadarshine et al., 2017).

The Faculty of Economics in State Islamic University of Malang has a vision, that is to integrate science and Islam with an international reputation. To achieve that vision Faculty of Economics needs to have an integrative database to make their daily work easier and can concentrate for the strategic work, Faculty of Economics currently has several information systems to improve academic services. Among the various information systems, the most common one is web-based. These web-based information systems require a login account and a link or URL (Uniform Source Locator) to access them. But some of these applications are not able to cover all student activities such as student final assignments. These activities range from outline registration to final exams, to include Turnitin and submission of final documents to the faculty library and for the purposes of legalizing diplomas for alumni. With the One Single System (OSS) application based on Web Cloud Computing, it is possible to improve student academic services through ease of registration for exams and ease of administration because it has been designed as one door for all kinds of registration channels. Not only that, in the future this OSS can be developed for correspondence services at the faculty scale as well as a menu for legalizing diplomas for alumni. On the other hand, the convenience for the study program is efficiency in student and alumni administration activities. So far, the study program has opened and closed registration through google form manually and verified student files manually as well. This allows it to take longer time and energy so that it is inefficient because the ratio between students and education staff in the management study program is very small. With this OSS, it can shorten the overall flow of exam administration. Furthermore, students do not need to provide printed files because the OSS system can store every student document through the cloud (digital storage). We name the OSS system with "ACCESS".

The Technology Acceptance Model (TAM) is used to look at the factors that influence the acceptance of a system/information system. The Theory of Reasoned Action (TRA) developed by Ajzen and Fishbein is the basis of TAM. Fred Davis first used this model in 1986. The TAM developed by Davis has added two main constructs to the TRA model. These are perceived ease (perceived ease of use) and perceived usefulness. According to TAM, user acceptance of information technology systems is influenced by these two main constructs. Five main constructs comprise the unmodified TAM structure. They are perceived ease of use (perceived ease of

use), perceived usefulness (perceived usefulness), usage attitude (usage attitude), usage behavior intention (usage behavior intention), and actual system usage.

With the One Single System (OSS) application based on Web Cloud Computing, we will examine the effect of perceived security, perceived ease of use and perceived usefulness toward the intention to use and we will do the mediation effect into the Acceptance of the OSS. Our research model are shown in Figure 1 below.

Perceived security, which is defined as a person's perception of how safe they feel when using the system (Chawla & Joshi, 2019). Show that high security perceptions can affect a person's interest in using the system (Alshurideh et al., 2021; Chawla & Joshi, 2019; Kumar et al., 2018; Marianus & Ali, 2021). Perceived ease is the degree to which a person feels that using a particular system can reduce the amount of effort needed to complete a particular task. Ease means no problems or no effort required. Perceived ease, also known as perceived convenience, refers to the user's belief that the technology system used does not require much effort to use (Al-Emran et al., 2020; Ibrahim et al., 2017). Perceived usefulness is the level at which a person considers that a particular system can improve the performance or work performance of its (Al-Emran et al., 2020; Ibrahim et al., 2017). Behavioral intention refers to the individual's intent to accomplish a particular behavior. Various scholars argued that behavioral intention has a strong link with the acceptance and usage of a particular technology (Al-Emran et al., 2020). According to TAM and the "Theory Of Reasoned Action (TRA)", behavioral intention is regarded to be the most effective predictor of actual system use (Sek et al., 2010; Yang et al., 2021). Actual system usage is a real condition of system application. The form of measurement of actual system usage is how often and duration of use of the application or website (in this case is ACESS) (Al-Emran et al., 2020; Chahal & Rani, 2022). In this research, we associate the Actual Usage as an Acceptance of our website, that called ACCESS.

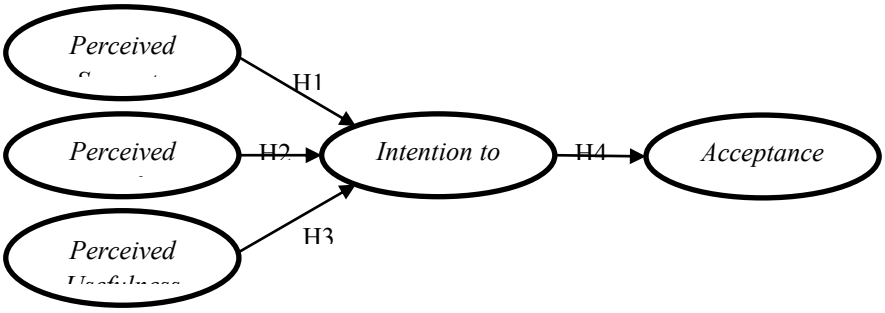

Figure 1. Research Model

Based on the above background, researchers focus on the perceived security, perceived usefulness, perceived ease of use on intention to use in ACCESS and the acceptance of ACCESS on improving the performance of Management Study Program services for students and alumni so that later it can support the study

program accreditation process. Researchers took the object of research on the development of an OSS system based on Web Cloud Computing with the Technology Acceptance Model approach in the Management Study Program Faculty of Economics Maulana Malik Ibrahim State Islamic University Malang.

RESEARCH METHOD

This research uses a quantitative method with a descriptive approach. In this study, data were collected through surveys, namely questionnaires to measure research variables objectively. Based on the purpose of this research, which is to examine the influence of the variables perceived security, perceived usefulness, perceived ease of use on intention to use and actual usage of ACCESS, this research is more suitable if it uses a type of quantitative research with a structural model. Data sources are obtained from primary and secondary data. Primary data is in the form of information directly experienced and felt by informants, namely from the answers to questionnaires filled out by respondents. Secondary data is obtained from the results of literature review as supporting data.

Tabel 1. Question Items

Variable	Code	Question Item
Perceived Security (X1)	PS1	We trust the security of our data at ACCESS
	PSI2	We believe services at ACCESS are potentially more secure than the rest of the web
	PS3	We believe the probability of data loss in ACCESS is low
	PS4	We believe ACCESS performs regular maintenance
Perceived Usefulnes (X2)	PU1	With ACCESS, we feel more effective in the administrative process (ex: registering proposals, PKL, thesis etc.)
	PU2	With ACCES, we feel more efficient in the administrative process (ex: registering proposals, PKL, thesis etc.)
	PU3	The presence of ACCESS is very useful for me
	PU4	With ACCESS everything becomes easier
	PU5	I get a lot of information related to academic affairs with the presence of ACCESS
Perceived Ease of Use (X3)	PEU1	Menus in ACCES are easy to use
	PEU2	Display menu in ACCESS is very clear
	PEU3	Menus in ACCESS are easy to understand
	PEU4	The user interface of ACCESS is not boring
Intention Use (Y1)	IU1	We will always use ACCESS
	IU2	We will use ACCESS in the near future
	IU3	We will recommend ACCESS to friends
	IU4	We will often use ACCESS in the future (for diploma legalization purposes)
	IU5	I will continue to use ACCESS over other websites (ex: siakad, e-learning etc.)
Actual Usage	AU1	I feel comfortable using ACCESS

Variable	Code	Question Item
of ACCESS	AU2	I enjoy using ACCESS
(Y2)	AU3	I think the look of ACCESS is not boring
	AU4	ACCESS gave me the information I needed
	AU5	ACCESS provide accurate information
	AU6	I use ACCESS for a long duration (during my college years)

Source: Processed Data, 2023

The population used was all ACCESS users in the Faculty of Economics. Sample determination using purposive method. The minimum number of samples based on is multiplied by 5-10 the number of indicators so that the sample in this study was 144 respondents (Yang et al., 2021). The respondent criteria are as follows: (1) Management students of the Faculty of Economics; (2) Students who have used ACCESS for letter submission. General description of the respondents in this research, namely gender, class year and study program. The point scale in this study is using a Likert scale of 1 to 5 consisting of: Strongly Disagree - Strongly Agree. This study uses data analysis in the form of SEM-PLS with the help of SMART-PLS software. In evaluating the model in PLS-SEM consists of two sub models, namely structural model or inner model and measurement model or outer model.

RESULT AND DISCUSION

Website ACCESS

ACCESS is the official website of the Faculty of Economics used for three study programs namely Management, Accounting, and Islamic Banking. ACCESS was inaugurated since September 2022. The use of the ACCESS website was originally only used for the student graduation process from submitting oulines, proposal exams, and theses, now it is rapidly developing into the main website used for services in the Faculty of Economics, especially the Management Study Program. Where this development was welcomed by all members of the academic community of the Faculty of Economics. The next development is related to academic and student services through https://access.fe.uin-malang.ac.id. The services available are as follows: (1) Thesis research permit; (2) Course observation permit; (3) Field work practice (PKL) permit; (4) Internship permit; (5) Scholarship recommendation letter; (6) Certificate of study and good behavior; and (7) Letter of recommendation to participate in activities.

Respondents

Respondents in this study were 144, where the general description of respondents was seen from gender, entry class, and study program. Based on gender, the largest number is female as many as 94 (65%) respondents and male 50 (35%) respondents. The characteristics of respondents based on the entry force, namely 2020 and 2021, were the most, namely 38 respondents (27%), the 2019

and 2022 entry forces were the same as 29 respondents (20%), then the 2018 entry force was 9 respondents, and the last was the least entry force in 2018 as many as 1 respondent.

Tabel 2. Respondent Overview

Characteristics	Type	Quantity
Gender	Male	50
	Female	94
Class year	2018	9
	2019	29
	2020	38
	2021	38
	2022	29
	2023	1
Study Program	Management	144

Source: Processed Data 2023

Outer Model

In the model specification in SEM-PLS, outer model testing is carried out, which is to determine whether the items used in this study are valid and reliable. In this study, the items used have convergently met the requirements, namely having an outer loading value <0.7 except for item IU5. We then dropped this invalid item and retested it. Discriminantly, items are declared valid if all values are greater than the correlation value between one construct and the value of other constructs. Reliability measurement in this study uses the composite reliability test and Cronbach's alpha test. Constructs are declared reliable if they have a composite reliability value> 0.70 and Cronbach's alpha > 0.70. The test results show that all of our constructs are reliable.

Inner Model

Inner model testing describes the causal relationship between latent variables that have been built based on the substance of the theory and serves to predict the causal relationship between latent variables or variables that cannot be measured directly. There are several tests for structural models, such as: (1) R-Square on endogenous constructs (Sekaran & Bougie, 2016). The R-Square value is the coefficient of determination on endogenous constructs. According to Chin (1998), the R square value is 0.67 (strong), 0.33 (moderate) and 0.19 (weak). In this study, the value of R Square is strong; (2) Estimate for Path Coefficients, is the value of the path coefficient or the magnitude of the influence of latent constructs. The following are the results of testing the structural model in this study which can be seen in the Table 3.

Based on Table 3 above, that the variable perceived security (X1) on the acceptance of ACCESS is positively significant because the p-value is 0.000; perceived usefulness (X2) on the acceptance of ACCESS is positively significant with

a p-value of 0.006; perceived ease to use (X3) on the acceptance of ACCESS is positively significant with a p-value of 0.001; intention to use (Z) on acceptance of ACCESS is positively significant with a p-value of 0.000; while the variable perceived security (X1) on intention to use is stated positively significant because the p-value is 0.000; perceived usefulness (X2) on intention to use is positively significant with a p-value of 0.000; perceived ease to use (X3) on intention to use is positively significant with a p-value of 0.001.

Tabel 3. Path Coefficients

	T Statistics	P Values	Description
Intention to Use -> Actual Usage of ACCESS	25,627	0,000	Significant
Perceived Ease of Use -> Actual Usage of ACCESS	3,234	0,001	Significant
Perceived Ease of Use -> Intention to Use	3,361	0,001	Significant
Perceived Security -> Actual Usage of ACCESS	3,878	0,000	Significant
Perceived Security -> Intention to Use	3,772	0,000	Significant
Perceived Usefulness -> Actual Usage of ACCESS	4,339	0,000	Significant
Perceived Usefulness -> Intention to Use	4,596	0,000	Significant

Source: Processed Data 2023

Effect of Perceived Security to Intention to Use

The first hypothesis in this study is the effect of perceived security on intention to use in ACCESS users. The test results showed a significant positive effect. This result is in accordance with previous research (Ariningsih et al., 2022; Ringle et al., 2012; Yousafsai et al., 2003). Perceived security is the level of trust of users of web-based applications or sites that are used safely (Chawla & Joshi, 2019). With a sense of security felt by users, this will have an impact on user intentions in accessing a system. Guaranteeing the security of personal data when using applications is an important thing that consumers pay attention to (Ariningsih et al., 2022).

Effect of Perceived Usefulness to Intention to Use

The second hypothesis in this study is the effect of perceived usefulness on intention to use in ACCESS users. The test results revealed that perceived usefulness on intention to use has a significant positive effect. This research is in accordance with previous research (Ibrahim et al., 2017; Lim et al., 2019; Yang et al., 2021). In the context of using the OSS application, of course, perceived usefulness is one of the consideration factors before users use the application. The convenience resulting from the value of using a technology is the attraction of consumer interest (Chawla & Joshi, 2019). Users tend to be interested in using a system, when the system has many benefits that are felt by users of the system

(Yang et al., 2021). When the benefits obtained meet expectations and can increase productivity more efficiently, it will optimize the intention to use.

Effect of Perceived Ease of Use Intention to Use

The third hypothesis in this study is the effect of perceived ease of use on intention to use in ACCESS users. The test results show that the effect of perceived ease of use on intention to use is significantly positive. This is in accordance with previous research (Al-Emran et al., 2020; Chawla & Joshi, 2019; Ibrahim et al., 2017). Based on the findings of this study, students of the Management study program feel that the use of ACCESS is very flexible and easy when used to submit letters, outline registration, proposal exams, thesis exams, and other academic services. The results of this study are consistent with the research described by Chawla & Joshi (2019); Ibrahim et al., (2017); Kumar et al., (2018) which states that users will feel comfortable with using an easy system so that they have a high interest in using it. Individuals will consider aspects of the ease or difficulty of using a technology before deciding to use it (Ikhsan, 2020). Furthermore, research conducted Al-Emran et al., (2020) revealed that users' behavioral intention to use a technology system will increase if they realize that the system used is easy.

Effect of Intention to Use Actual Usage of ACCESS

The fourth hypothesis in this study is the effect of intention to use on acceptance of ACCESS. The management results of the Smart PLS 3.0 program reveal that the effect of intention to use on acceptance of ACCESS has a p-value of 0.000 and a positive coefficient value of 0.796. Based on the results in this study in accordance with previous research Fath & Rahardjo (2023); Yang et al., (2021) which states that intention to use has a positive relationship with the acceptance of ACCESS. Based on previous research and statistical results, the fourth hypothesis in this study is accepted.

Intention to use is a significant determinant of the actual use of a system. intention to use according to Yang et al., (2021) is the extent to which a person feels his willingness to use a service can be compared to self-instructions that allow him to perform certain behaviors. Previous literature suggests that behavioral intention is the strongest predictor of system use. Behavioral intention is seen as the intention of a person to carry out a certain activity.

CONCLUSION

The conclusions of this study are in accordance with the reality of the field related to the application of TAM theory to use ACCESS in the Management Study Program, namely: (1) Perceived security has a positive influence on intention to use. This finding shows that the implementation of OSS in the Management Study Program will provide security to users (students) to get academic services so as to

increase the use of ACCESS; (2) Perceived usefulness has a positive influence on intention to use. Based on the results of the research findings, it shows that the use of OSS in the Management Study Program will increase the intention to use because academic services are faster and easier to use; (3) Perceived ease to use has a positive influence on intention to use. The results of the research conducted show that the perceived ease of use of the OSS application in the Management Study Program will increase the intention to use the application; (4) Intention to use has a positive influence on the acceptance of ACCESS. When OSS users in the Management Study Program have the intention to use due to the need to submit letters, users will accept the existence of ACCESS for OSS in the Management study Program. The recommendations for further research are combining TAM and TPB, adding trust, subjective norm, perceived financial cost variables, for research objects, it can be applied to regional government agencies, expanding the research sample not only within the scope of the study program

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