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User Behavior on Actual Use of Academic Information System in Makassar State University: Is Information Technology Facilities Have a Moderating Role to Strengthen the Behavior?

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A R T I C L E I N F O

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A B S T R A C T

This study aims to determine factors that influence the use of information technology in higher education, especially at Makassar State University. The type of information technology studied is academic information systems. This study combines two theories, namely the Technology Acceptance Model (TAM) and The Theory of Planned Behavior (TPB) to explain the user behavior for the use of academic information systems at Makassar State University. The results of this study indicate that perceived usefulness and ease of use significantly affect user behavioral intention to use academic information systems. Behavioral intention significantly affected actual use of the academic information system. An interesting finding is that the facilities available for the use of the system in the campus environment have no significant effect on the use of the academic information system at Makassar State University.

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INTRODUCTION

Information technology continues to play an important role in the survival of an organization, including universities. Zucker and UNESCO officials in Indrajit (2014) who state that the greatest impact of the development of information technology in the world will be on the education sector. This can be seen from one of the requirements for a university to become a world class university, namely the availability of facilities at the university where the facility is information technology.

Nugroho (2009) explains that the use of information technology in universities can be a strategy in facing competition. InfoDev (2010) also notes that information technology can be used to improve the quality of education. Anthony et al. (2020) also revealed that technology can be an asset for students to face the world of work. The improvement in the quality of education can be seen from the increasing development of educational content, supporting administrative processes and increasing access to education. One of the other benefits of using information technology is that it can be used for in-class learning and distance learning (learning management system).

One of the universities in Makassar City that has utilized information technology is Makassar State University (UNM). Makassar State University has implemented technology to support the implementation of education. One form of implementation is the use of System and Application Management Open Knowledge (SYAM-OK) to support online learning and academic process (Aris et al., 2023). SYAM-OK is integrated with several system in UNM, namely Content Management System (CMS) and Academic Information System (SIA). The use of SYAM-OK has caused UNM to receive national recognition as the first best online learning system at the 2022 Diktiristek Award Event.

However, based on the author's search on Webometrics (2023), universities in Indonesia still have difficulty competing with other universities in the world. The highest ranking of Indonesian universities is 561st, UNM itself is ranked 2,624. Data also shows that nationally, UNM is ranked 29th in universities that utilize technology. This certainly needs to be a concern so that UNM can continue to develop strategies in implementing the online learning system so that it can be better in the future.

Therefore, researchers are interested in conducting research on the factors that influence the application of information technology in higher education, especially at UNM. This research will focus on user behavior towards the acceptance of academic information system. The Technology Acceptance Model will be used to explain information technology acceptance behavior and add information technology facility variables as a mediating variable that is

predicted to strengthen or weaken user behavior in actual use of information systems.

LITERATURE REVIEW

Technology Acceptance Model

The Technology Acceptance Model (TAM) is a model used to explain the factors that influence user behavior in the actual use of information technology. TAM is to provide an explanation of the determination of the acceptance of information technology in general, providing an explanation of user behavior or attitudes in a population (Davis, 1985). TAM states that the actual use of information technology is influenced by behavioral interest, where behavioral interest is determined by two beliefs, namely: first, perceived usefulness and perceived ease of use.

Perceived usefulness is a form of one's belief that using information systems or technology can improve performance in work or activities. This shows that the more useful a system or information technology is for the work or activities of its users, the user will have an interest in continuing to use the system or information technology. Several previous studies found a significant influence of perceived usefulness on behavioral intention (Aris, 2015; Aris et al., 2016; Budi et al., 2021; Peng & Yan, 2022; Perwitasari, 2022; Widiar et al., 2023). However, several studies found an insignificant influence between perceived usefulness and behavioral intention (Muslichah, 2018; Nainggolan et al., 2023; Szajna, 1996).

H1: Perceived Usefulness has a significant effect on Behavioral Intention

Perceived ease of use is a form of one's belief that using information systems or technology in addition to improving performance will also be free from excessive physical and mental efforts. This definition implies that if a user believes that a system or information technology is easier to use compared to other systems, then that user will tend to use an easier system. Several previous studies found a significant influence of perceived ease of use on behavioral intention (Aris et al., 2016; Basuki et al., 2022; Prastiawan et al., 2021; Putri, 2021). However, several studies found an insignificant influence between perceived ease of use and behavioral intention (Budi et al., 2021; Davis et al., 1989; Widiar et al., 2023).

H2: Perceived ease of use has a significant effect on Behavioral Intention

H3: Behavioral Intention has a significant effect on the Actual Use of Information Systems

Theory of Planned Behavior

Theory of Planned Behavior (TPB) explains that the presence or absence of resources (such as money, time, expertise, cooperation and others) is a prerequisite for the implementation of a behavior (Ajzen, 1991). In this study, researchers tried to test information technology facilities (such as internet

networks, wi-fi availability, hardware availability, helpdesk and others) which were then categorized as resources that could influence behavior based on TPB. Indrajit (2014) explains that the theory of the application of information technology includes 2 (two) aspects, namely supply and demand. Information systems are the demand side of the organization while information technology is the supply side of the organization's needs. In conclusion, to implement an information system, of course, the availability of information technology facilities is required. Lack of information technology facilities will result in a low level of use of information technology.

H4: Information Technology Facilities strengthen the influence of Behavioral Interest on the Actual Use of Information Systems.

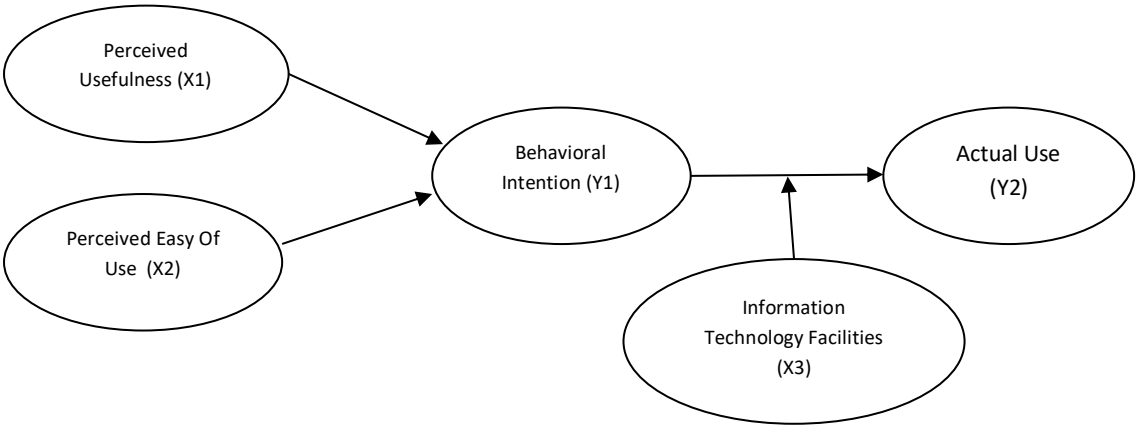

Figure 1. Conceptual Framework

METHODOLOGY

The population in this study were students who used academic information systems at Makassar State University (UNM). Samples were taken from students who use academic information systems using purposive sampling technique. The number of respondents is as many as 90 people with criteria, namely students who are active and students who have experience using the academic information system at UNM at least once use. The data used are primary data using a questionnaire. The questionnaire uses a Likert scale 1-5 where 1 indicates strongly disagree, 2 disagree, 3 doubt, 4 agree and 5 strongly agree.

RESEARCH RESULT

Respondent Characteristics

The characteristics of the respondents in this study based on their department, gender, age, study period and experience of use information technology are as follows:

Table 1. Respondent Characteristics

No	Characteristics	Category	Freq	%
1	Department	Exact	58	64,44
		Non Exact	32	35,56
		Total	**90**	**100**
2	Gener	Male	31	34,44
		Female	59	65,56
		Total	**90**	**100**
3	Age	≤ 20 years	55	61,11
		21–25 year	34	37,78
		26–30 year	1	1,11
		Total	**90**	**100**
4	Study Period	2 Semester	14	15,56
		4 Semester	19	21,11
		6 Semester	39	43,33
		8 Semester	13	14,44
		10 Semester	5	5,56
		Total	**90**	**100**
5	Experience of use IT	Hardware	82	91,11
		Software	83	92,22
		Computer Course	24	26,67

Based on the data in the table above, it can be concluded that most of the respondents in this study were students who came from the exact faculties amounting to 64.44%. In addition, the largest number of respondents are those under the age of 20 with female gender. The data in the table also shows that almost all respondents have experience using information technology in the form of hardware and software. This experience was obtained from previous experience using academic information systems at Makassar State University with the highest number of uses as much as at least 1 time.

Validity Test

Table 2. Validity test result

	X1	X2	X3	X4	Y1	Y2
Facilitation * Behavioral Intention						0.894
X1.4	0.534					
X1.5	0.764					
X1.6	0.758					
X1.7	0.730					
X1.8	0.560					
X2.4		0.600				
X2.5		0.649				

X2.6		0.770				
X2.7		0.763				
X2.8		0.670				
X3.1			0.648			
X3.2			0.629			
X3.3			0.578			
X3.4			0.678			
X3.5			0.616			
X3.7			0.686			
Y1.1				0.627		
Y1.2				0.684		
Y1.3				0.707		
Y1.4				0.679		
Y1.6				0.738		
Y1.7				0.588		
Y2.1					0.882	
Y2.2					0.772	
Y2.3					0.811	

The results of the validity test show that the loading factor value is above the recommended value of 0.5. The smallest value is 0.534 for the X1.4 indicator. It means that the indicators used in this study are valid or have met the convergent validity. Furthermore, reflective indicators also need to be tested for discriminant validity by cross loading as follows:

Table 3. ***Discriminant validity cross loading*** **result**

	X1	**X2**	**X3**	**X4**	**Y1**	**Y2**
Facilitation * Behavioral Intention	0.154	0.173	0.234	0.223	0.148	0.894
X1.4	0.534	0.123	0.094	0.143	0.024	-0.069
X1.5	0.764	0.241	0.316	0.207	0.188	0.261
X1.6	0.758	0.236	0.255	0.330	-0.071	0.102
X1.7	0.730	0.119	0.268	0.279	0.110	0.101
X1.8	0.560	0.103	0.125	0.196	0.271	0.089
X2.4	0.183	0.600	0.250	0.227	0.001	0.056
X2.5	0.101	0.649	0.285	0.195	0.057	0.181
X2.6	0.141	0.770	0.329	0.249	0.019	0.130
X2.7	0.179	0.763	0.284	0.250	0.122	0.178
X2.8	0.237	0.670	0.220	0.275	0.066	0.068
X3.1	0.126	0.172	0.648	0.285	0.183	0.181
X3.2	0.267	0.206	0.629	0.205	0.191	0.217
X3.3	0.171	0.027	0.578	0.224	0.214	0.070
X3.4	0.239	0.422	0.678	0.426	0.177	0.156

X3.5	0.169	0.144	0.616	0.308	0.143	0.108
X3.7	0.257	0.432	0.686	0.294	0.319	0.164
Y1.1	0.319	0.257	0.376	0.627	0.234	0.252
Y1.2	0.218	0.242	0.356	0.684	0.399	0.166
Y1.3	0.261	0.292	0.238	0.707	0.239	0.127
Y1.4	0.296	0.086	0.296	0.679	0.275	0.120
Y1.6	0.223	0.245	0.335	0.738	0.246	0.120
Y1.7	0.109	0.287	0.149	0.588	0.146	0.085
Y2.1	0.153	0.144	0.291	0.336	0.882	0.104
Y2.2	0.093	0.035	0.190	0.368	0.772	0.123
Y2.3	0.069	0.010	0.357	0.271	0.811	0.139

The indicator is declared valid if it has the highest loading factor for the intended construct compared to loading factors for other constructs. The table above shows that the loading factor for the Usefulness indicator (X1.4 to X1.8) has a higher loading factor for the Usefulness construct than other constructs. As an illustration, the loading factor X1.4 for Usefullness is 0.534 which is higher than the loading factor for Easy Of Use (0.173), Behavioral Intention (0.234), Facilitation (0.223) and Actual Use (-0.069). The same thing is seen in other indicators. Thus, latent contracts predict indicators on their block better than indicators on other blocks.

Reliability Test

The reliability test is done by looking at the composite reliability value of the indicators measuring the construct. The results of composite reliability will show a satisfactory value if it is above 0.7.

Table 4. Composite Reliability Test

	Composite Reliability
Usefulness	0.805
Easy Of Use	0.821
Behavioral Intention	0.831
Facilitation	0.806
Actual Use	0.862
Moderating Effect	1.000

The table above shows that the composite reliability value for all variables is above 0.7 which indicates that all variables in the estimated model meet the criteria for discriminant validity. The lowest composite reliability value is 0.806 in the construct of Behavioral Intention. Reliability test can also be strengthened with Cronbach's Alpha where the results of the analysis are as follows:

Table 5. Cronbach's Alpha Test

	Cronbach's Alpha
Usefulness	0.708
Easy Of Use	0.728
Behavioral Intention	0.759
Facilitation	0.721
Actual Use	0.759
Moderating Effect	1.000

The results of the analysis show that the Cronbach's Alpha value for all variables in this study is above 0.6 which indicates that all variables in the estimated model meet the criteria for discriminant validity.

Structural Model Testing

After the estimated model meets the Outer Model criteria, the next step is testing the structural model (Inner model). Here are the R-Square values of the construct:

Table 6. R-Square

	R-Square
Behavioral Intention	0.202
Actual Use	0.191

The table above gives a value of 0.202 for the Behavioral Intention variable, which means that the Usefullness and Easy Of Use variables are able to explain the Behavioral Intention variable by 20.20%. The R-Square value is also found in Actual Use which is influenced by Behavioral Intention and Facilitation, which is 0.191, which means that the Behavioral Intention and Facilitation variables are 19.10%. Hypothesis testing is as follows:

Table 7. Hypothesis testing results

	Original Sample	**Sample Mean**	**Standard Deviation**	**T Statistic**
Behavioral Intention -> Actual Use	0.298	0.272	0.124	2.402
Easy Of Use -> Behavioral Intention	0.276	0.295	0.085	3.235
Facilitation -> Actual Use	0.200	0.267	0.108	1.850
Facilitation Moderating -> Actual Use	0.039	0.035	0.107	0.362

Usefulness -> Behavioral Intention	0.293	0.322	0.098	3.000

DISCUSSION

Table 7 shows that Usefulness has a significant effect on Behavioral Intention with a T-statistic of 3,000 (> 1,989). The original sample estimate value is positive, which is 0.293 which indicates that the direction of the relationship between Usefulness and Behavioral Intention is positive. Thus Hypothesis 1 in this study which states that "Perceived Usefulness has a significant effect on Behavioral Interest" is accepted. These findings indicate that the academic information system at universities at Makassar State University is felt to be useful by students. The benefits felt by students include: access to more academic information, access to academic information faster and easier, academic information can be accessed anywhere and anytime and they feel more effective in using academic information systems than managing academic administration manually. This theme is in line with the findings of several previous researchers (Aris, 2015; Aris et al., 2016; Budi et al., 2021; Peng & Yan, 2022; Perwitasari, 2022; Widiar et al., 2023).

Easy Of Use has a significant effect on Behavioral Intention with a T-statistic of 3,235 (> 1,989). The original sample estimate value is positive, namely 0.276 which indicates that the direction of the relationship between Easy Of Use and Behavioral Intention is positive. Thus Hypothesis 2 in this study which states that "Perceived Ease of Use has a significant effect on Behavioral Interest" is accepted. These findings indicate that students feel that the academic information system at Makassar State University is easy enough to use. Their experience in using academic information systems every semester to facilitate their academic administration management on campus continues to increase user perceptions that academic information systems are easy to use. This theme is in line with the findings of several previous researchers (Aris et al., 2016; Basuki et al., 2022; Liao et al., 2018; Prastiawan et al., 2021; Putri, 2021).

Behavioral Intention has a significant effect on Actual Use with a T-statistic of 2.402 (> 1.989). The original sample estimate value is positive, which is 0.276 which indicates that the direction of the relationship between Behavioral Intention and Actual Use is positive. Thus Hypothesis 3 in this study which states that "Behavioral Interest has a significant effect on the Actual Use of Information Systems" is accepted. These findings indicate that students' interest in using academic information systems every semester is quite high. This can be seen from the student's statement that in the future they will still use the academic information system. In addition, the frequency and intensity of the use of academic information systems each semester are quite high. This finding is in line with several previous studies (Aris et al., 2016; Davis, 1989; Hung et al., 2001).

Facilitation has no significant effect on Actual Use with a T-statistic of 1,850 (<1,989) and Facilitation Moderating has no significant effect on Actual

Use with a T-statistic of 0.365 (<1.989). Thus Hypothesis 4 in this study which states that "Information Technology Facilities strengthen the influence of Behavioral Interest on the Actual Use of Information Systems" is rejected. This shows that the existing facilities at Makassar State University are currently insufficient to support the use of academic information systems on campus. Another interesting finding is that facilitation weakens the effect of behavioral intention on the actual use of the academic information system at Makassar State University. These findings indicate that most academic information system users do not access the system on campus and tend to use private facilities to access the system. Therefore, Makassar State University managers must immediately take action related to the problem of this facility because it can lead to decreased user satisfaction and can affect the competitiveness of higher education. The same thing was found by Aris et al. (2016) which states that information technology facilities such as the availability of hardware and internet networks at universities in Makassar City have no effect on student interest in using information systems on campus.

CONCLUSIONS AND RECOMMENDATIONS

a. Based on the results of the analysis and discussion described earlier, the following conclusions can be drawn: Usefulness has a significant effect on the behavioral intention of the academic information system at Makassar State Univeristy.
b. Easy Of Use has a significant effect on the behavioral intention of the academic information system at Makassar State Univeristy.
c. Behavioral intention has a significant effect on the Actual Use of the academic information system at Makassar State Univeristy.
d. Facilitation does not have a significant effect on the Actual Use of the academic information system at Makassar State Univeristy.
e. Facilitation is not significant as a moderating variable between the influence of Behavioral intention and Actual Use of the academic information system at Makassar State Univeristy.
f. For the next research it is suggested to add other variables to explain behavioral intention besides usefulness and Easy Of Use because based on the analysis results, the independent variable only explains 20% related to Behavioral Intention.
g. It is recommended for Makassar State Univeristy to immediately take action related to information technology facilities on campus because the results of this study indicate that the currently available facilities tend to weaken the actual use of the Academic Information System in the Campus Environment.

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