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Assessment of Usability and Acceptance of An Academic Information System Using SUS And TAM Adaptation

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Abstract — Organizations, companies, and the world of education carry out all learning activities using e-learning. There is an important part that requires an academic system with structured data, namely the system at private universities in Indonesia, for example,Informatics and Business Institute Darmajaya. Darmajaya is one of the educational institutes that uses online learning media information technology called e-learning for students and lecturers. The newest information system used at IIB Darmajaya is the academic information system (AIS) which consists of Darmajaya students and lecturers. Result from the assessment showing of lecturers understand how to use AIS with value 56.92, and 65.93 from students of IIB Darmajaya.

Keywords :SUS,TAM, Evaluation, Acceptance, Usability

I. INTRODUCTION

COVID-19 or what is called Coronavirus Disease-2019 is a disease outbreak that first appeared in China in 2019. The world health organization, namely World Health Organization (WHO) said this outbreak aspandemic in March 2020 [1]. Everyone in the world is required to stay at home (Work From Home) due to the pandemic conditions [2]. All educational agencies/institutions are required to follow government regulations and innovate in the learning process so that it continues to run when a disaster/pandemic occurs. The government is calling for and issuing a social restriction policy (PSBB) to prevent the spread of the COVID-19 virus [3]. All educational agencies/institutions must implement various innovations in the process learning Whichdonein a wayon line(online). However, not a few in the implementation of online learning activities are carried out well, some also have obstacles/problems both from an internal perspective.or external. This of course can hinder the learning process in the world of education [4].

The newest information system used at IIB Darmajaya is the Academic Information System (AIS) which consists of Darmajaya Students and Lecturers which is currently used by IIB Darmajaya

students and lecturers. AIS has been used since the 2020 pandemic until now (approximately 2 academic years). Problems that arise from using this new system include that the features provided by the AIS system still have many shortcomings in terms of appearance and ease of access by users. For example, at lecturer.darmajaya.ac.id there are still many lecturers who are confuseduse the portal. Like wise with the students.darmajaya.ac.id portal, where many students still have difficulty filling in KRS online, sending assignments, checking daily schedules, making changes to data and payments, as well as other academic activities.

The level of understanding of lecturers and students in using AIS also still needs to be improved.There has been no comprehensive evaluation of the AIS Darmajaya system, especially students and lecturers, including ease of access with the features (UI/UX) provided, as well as the satisfaction of lecturers and students in using AIS Darmajaya as a learning medium.

Therefore, in this research will assessment about user interface and design analysis of the AIS Darmajaya using System Usability Scale (SUS) method and TAM adaption. The System Usability Scale is a method used to evaluate the level of usability of a system by conducting direct testing on users. In SUS, the ability to measure usability is interpreted into 4 stages, namely Acceptability Ranges, Grade Scale, Adjectives Rating, and Promoters and Detractors. Where results Which obtained from each this measurement will different point the focus, so level of management makes it easier to make decisions from each of these interpretations.

II. RESEARCH METHODOLOGY

A. Planning (Planning)

Formulating research problems and objectives, determining research objects, namely lecturers and students who use the AIS Darmajaya Website at IIB

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Darmajaya, as well as conducting literature studies (definitions, frameworks, etc.).

B. Inspection Field (Observation)

Distribute questionnaires online via Google Form about use students and lecturer Darmajaya to a lecturer and student. In study this samples that will be used to fill out the questionnaire via GoogleForm a is student AndlecturerFY.2020/2021 and FY. 2021/2022

C. Reporting (Reporting)

Reporting the results of process analysis from questionnaires that have been distributed based on system usability scale calculations through quantitative calculations according to existing scores, as well as interpreting SUS values into evaluations to determine the level of user satisfaction, then evaluating the system based on the TAM model..

D. Act Carry on (Follow Up)

Follow-up this containing satisfaction analysis resultsthe use of AIS Darmajaya both from the lecturer and student side. The results obtained will be a follow-up to the evaluation of service improvements, especially UI/UX from AIS Darmajaya.

The method or tools used to evaluate the UI/UX of the Darmajaya AIS system is using the System Usability Scale (SUS) from the journal of [5]. They are reserach about evaluation of system usability scale from e-learning Darmajaya during COVID-19 using SUS method. This is technique which used to evaluate a wide range of products and services, including hardware, software, mobile devices, websites and mobile applications (Manic 2021). The SUS is a simple Likert scale with respondents required to answer levels of agreement and disagreement on a 5 or 7 point scale. SUS is a reliable, low-cost usability scale that can be used for global system usability testing.

III. RESULTS AND DISCUSSION

A. Charging Questionnaire

The questionnaire was distributed to respondents, lecturer and students of IIB Darmajaya. Respondents were asked to fill out a questionnaire via Google form with answer choices that matched their experience of using it Lecturer Darmajaya And Students Darmajaya. After the questionnaire was distributed to respondents, validity testing was carried out on the questionnaire data using SPSS 20.

B. Population and Sample

Population and sample will used by lecturer and students from IIB Darmajaya which is based on the website ais.darmajaya.ac.id. Sample of determination method used is a probability sampling technique, namely proportionate stratified random sampling using the Slovin formula. Probability sampling is a sampling technique that provides an equal opportunity for each element (member) of the population to be selected as a member of the sample. The sample size in this study was determined using the *Slovin equation*as follows [6] :

$$n = \frac{N}{1 + N.e^2}$$

n = minimum sample required for sample instruments
N = number of elements/totals of population
e = level of error (0,01 / 0,05 / 0,1)

In this study, researcher used 60 lecturer from total of population are 122 lecturer from all of major. The calculation for determining the number of respondents using the Slovin formula can be seen as follows :

$$n = \frac{122}{1+122.(0.01)} = \textbf{60 respondents}$$

Meanwhile, from the students are using AIS Darmajaya, researcher used 100 people from total of population are 2708 students from all of major. The calculation for determining the number of respondents using the Slovin formula can be seen as follows :

$$n = \frac{2708}{1+2708.(0.01)} = \textbf{100 respondents}$$

C. Validity Test

After distributing the questionnaire, all data from respondent will be processed using SPSS and objectives of the research can be understood by the respondents using validity test. Result of the questionnaire stated valid if r_count > r_table. And result for this study prove that r_table is **0.256**, it means the value data is Valid.

Table1. Test Validity SUS Lecturer Darmajaya

Pertanyaan	r_hitung	r_tabel	Kesimpulan
SUS1	0.709906	0.256	Valid
SUS2	0.274955	0.256	Valid
SUS3	0.610925	0.256	Valid
SUS4	0.25859	0.256	Valid
SUS5	0.57394	0.256	Valid
SUS6	0.32978	0.256	Valid
SUS7	0.74501	0.256	Valid
SUS8	0.41156	0.256	Valid
SUS9	0.69473	0.256	Valid
SUS10	0.58974	0.256	Valid
TAM1	0.71255	0.256	Valid
TAM2	0.71226	0.256	Valid
TAM3	0.66787	0.256	Valid
TAM4	0.68711	0.256	Valid
TAM5	0.71478	0.256	Valid
TAM6	0.77129	0.256	Valid
TAM7	0.59259	0.256	Valid
TAM8	0.78373	0.256	Valid
TAM9	0.72592	0.256	Valid
TAM10	0.82503	0.256	Valid
TAM11	0.76273	0.256	Valid

Table 1 shows that the r_count for the 21 questionnaire items is greater than the r_table, so the 21 questionnaire items are **valid.**

Table 2. Test Validity StudentsDarmajaya

$$n = \frac{N.}{1 + N.e^2}$$

| Pertanyaan	r_hitung	r_tabel	Kesimpulan
SUS1	0.89004	0.256	Valid
SUS2	0.27124	0.256	Valid
SUS3	0.88467	0.256	Valid
SUS4	0.42109	0.256	Valid
SUS5	0.90508	0.256	Valid
SUS6	0.37574	0.256	Valid
SUS7	0.86322	0.256	Valid
SUS8	0.31811	0.256	Valid
SUS9	0.78952	0.256	Valid
SUS10	0.63107	0.256	Valid
TAM1	0.86669	0.256	Valid
TAM2	0.89746	0.256	Valid
TAM3	0.90232	0.256	Valid
TAM4	0.89709	0.256	Valid
TAM5	0.90702	0.256	Valid
TAM6	0.91171	0.256	Valid
TAM7	0.90583	0.256	Valid
TAM8	0.87830	0.256	Valid
TAM9	0.91419	0.256	Valid
TAM10	0.93241	0.256	Valid
TAM11	0.92041	0.256	Valid

Table 2 shows that the r_count for the 21 questionnaire items is greater than the r_table, so the 21 questionnaire items are **valid**.

D. Calculation Score SUS

In calculating the level of usability using the method SUS used manually in form excel according with formula and rule count result susability. Researcher more over formerly recap results questionnaire which has been given, then carry out calculations using the formula explained in the previous chapter, namely [7] :

SUS score = ((Q1−1) + (5−Q2) + (Q3−1) + (5−Q4) + (Q5−1) + (5−Q6) + (Q7−1) + (5−Q8) + (Q9−1) + (5−Q10)) x 2.5

Based on questionnaire results from **60 respondents** from lecturer Darmajaya, obtained the average of SUS score is **56.92** , it means that it can be interpreted that Darmajaya lecturers are in the **Marginal category** , with **Grade D** and have **an OK rating** as in Figure 4.1.
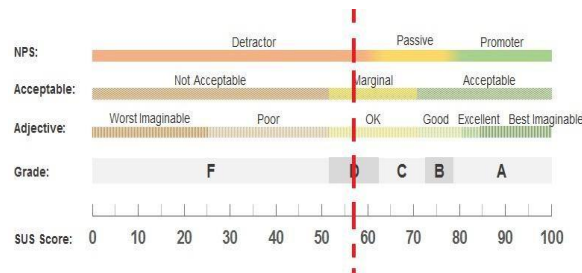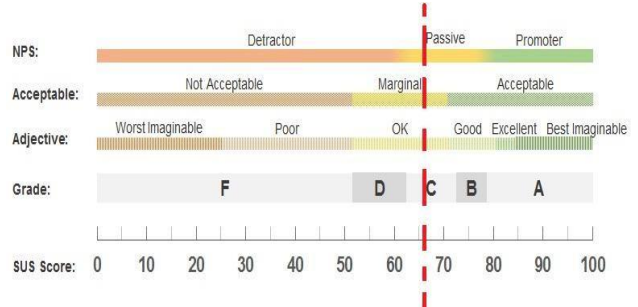

The score is interpreted into four type, namely:

1. The first score is the Acceptability Ranges interpretation, where the score for this research falls into the Marginal range.
2. Grade Scale interpretation, where the score obtained falls into grade D.
3. Interpretation of Adjective Rating, where the score obtained is included in the OK rating.
4. Interpretation of the Net Promoter Score, where the score obtained falls into the almost Passive Detractor category, namely the category of users

who are quite satisfied with using Lecturer Darmajaya but are less enthusiastic about their experience while using Lecturer Darmajaya.

Meanwhile score from questionnaire of 100 students obtained the average SUS score is **65.93** with a grade close to C which indicates OK. The SUS score of all Darmajaya student respondents is obtained from the average SUS score for each student respondent. From the analysis results, a value of **65.93 (Marginal) was obtained** which is based on the interpretation of the SUS value [8] as in Figure 4.2 .

The score is interpreted into four types of interpretation, namely:

1. The first score is the Acceptability Ranges interpretation, where the score for this research falls into the Marginal range.
2. Grade Scale Interpretation, where the score obtained is included in grade D. Adjective Rating Interpretation, where the score obtained is included in the OK rating.
3. Interpretation of the Net Promoter Score, where the score obtained falls into the Passive category, namely the category of users who are quite satisfied with the use of Student Darmajaya.

USING TAM ADAPTIONS

The results of the interpretation of calculations based on usefulness and convenience are presented in the respondent's interpretation table in table 4. 3

Table 4.3 Respondent Interpretation Criteria for TAM

No.	Interpretation	Information
1	0% - 24.99%	Very Useless/Easy
2	25% - 49.99%	Not Helpful/Easy
3	50% - 74.99%	Helpful/Easy
4	75% - 100%	Very Useful/Easy

From the data in table 1 above an interpretation of the score calculation is carried out based on a Likert scale of 1 to 5. From the interpretation criteria which are based on the usefulness and ease of use of the system adapted from the TAM model, a percentage will be obtained which states that the application/system is feasible. and categorized into applications that are easy to use and useful for students and lecturers. The table is presented in table 4. 4.

Table 4.4 Recapitulation of Respondents (Lecturer)

Question	Total Score	Max. Score
TAM 1	219	300
TAM 2	229	300
TAM 3	229	300
TAM 4	229	300
TAM 5	226	300
TAM 6	215	300
TAM 7	237	300
TAM 8	221	300
TAM 9	218	300
TAM 10	214	300
TAM 11	219	300
Total Score	**2456**	**3300**
Assessment Result = (2456/3300)*100%	**74,42%**	

Based on table 3, it shows that the average evaluation value of the Darmajaya Lecturer web portal using TAM (*Technology Acceptance Model*) at IIB Darmajaya from the aspect of convenience and usefulness is 74.42 % with the respondent's interpretation criteria being that it is useful and easy to use

Table 4.5 Recapitulation of Respondents (Students)

Question	Total Score	Max. Score
TAM 1	398	500
TAM 2	380	500
TAM 3	394	500
TAM 4	388	500
TAM 5	395	500
TAM 6	385	500
TAM 7	392	500
TAM 8	382	500
TAM 9	393	500
TAM 10	403	500
TAM 11	393	500
Total Skor	**4303**	**5500**
Assessment Result = (4303/5500)*100%	**78,24%**	

The average evaluation value of the Darmajaya student learning web portal using TAM (*Technology Acceptance Model*) at IIB Darmajaya from the aspectconvenienceAndexpediencyas big as 78.24%with the respondent's interpretation criteria, it is very useful and easy to use Darmajaya students for Darmajaya students so that it helps in the lecture process, the easier

the system is to operate, the better the level of acceptance of the system [9]. The benefits of Information Systems include speeding up work, improving performance and productivity, effectiveness, making it easier for us to do our work and also getting things donehelp with service [10].

Based on the results of the SUS & TAM calculations carried out, the usability results (level of satisfaction) of lecturers andstudentswith AIS Darmajaya were quitegood. It is stated that the ability of lecturers to use Darmajaya lecturers is quite good, but it is not recommended for others. Meanwhile, Darmajaya students are quite satisfied with using AIS compared to the old SISKA.Things that still need to be evaluated by AIS users are teaching & guidance activities that are not yet effective, and value input that is difficult to understand. As well as biodata input/updates that must be corrected to suit student data that will be used in the internal and external environment (PDDikti).

IV. CONCLUSION

The results of usability measurements can be the first step in evaluating a website. The SUS score of the Lecturer Darmajaya website is 56.92 and Student Darmajaya is 65.93 for the adjective rating including the poor category which is almostclose to OK ,withgradesscaleD,andincludingMarginal category for acceptability ranges where the website shows that the website is not yet *usable* or has a level of acceptanceuserWhichStilllowsoImprovements are needed to the website to get a better level of acceptance.

Based on the results of the validity test using SPSS 20 based on question items from the system usability scale (SUS) given to 60 respondents for Darmajaya lecturers and 100 respondents for Darmajaya students, the r_count>r_tabel value was obtained, which means all question items (instruments) were obtained from all domains. is Valid.

Based on evaluation using TAM (Technology Acceptance Model), the results show that overall the Darmajaya Lecturer website is considered useful and easy to use. Meanwhile, for Darmajaya students, it is very useful/easy to use so it really helps and supports lecturers and students in using the Darmajaya lecturer and Darmajaya student portals.

REFERENCES

[1] WHO Director-General's, *Opening Remarks at the Media Briefing on COVID-19*, vol. -: -, 2020.

[2] Rusman, *Pembelajaran Berbasis Teknologi Informasi Dan Komunikasi*. Jakarta: Rajawali Pers, 2015.

[3] H. Surya Siregar, H. Sugilar, and H. Hambali, "Merekonstruksi Alam dalam Kajian Sains dan Agama Studi Kasus pada Masa Pembatasan Sosial Berskala Besar (PSBB) Dampak Covid-19."

[4] R. Sanjaya, *21 Refleksi Pembelajaran Daring di Masa Darurat*. SCU Knowledge Media, 2020.

[5] R. Nurlistiani and N. Purwati, "Interpretasi Pengujian Usabilitas E-Learning di Masa Pandemi COVID-19 Menggunakan System Usability Scale".

[6] N. J. C. and S. H. Bevan, "ISO 9241-11 revised: What have we learnt about usability since 1998?." Human-Computer Interaction: Design and Evaluation: 17th International Conference, HCI International," in *usability since 1998*, Los Angeles, CA, USA: Springer International Publishing, 2015.

[7] B. and F. S. Tujni, "Implementasi Sistem Usability Scale Dalam Evaluasi Perspektif Pengguna Terhadap Sistem Informasi Akademik Berbasis Mobile," 2019.

[8] J. Sauro, ""Measuring U: Predicting Net Promoter Scores from System Usability Scale Scores," measuringu.com. https://measuringu.com/nps-sus/.

[9] R. Andriani, "Evaluasi Sistem Informasi Menggunakan Technology Acceptance Model dengan penambahan variable eksternal," *Teknologi Informasi Dan Ilmu Komputer*, 2020.

[10] Nurhayati, " Analisis Tingkat Penerimaan Pengguna Terhadap Teknologi Sistem Informasi Rekam Medis di PKU Muhamadiya Karanganyar," PKU Muhamadiya Karanganyar, 2019.