

Evaluation of SIAKAD ITSK RS dr. Soepraoen using Technology Acceptance Model

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Abstract

Institut Teknologi, Sains, dan Kesehatan (ITSK) RS dr. Soepraoen is one of the higher education institutions that implements academic information systems in the process of providing education. The academic information system (SIAKAD) involves many users and many data processings, so there is possibility of problems with network access. Therefore, an evaluation is needed to determine user's acceptances of the performance of SIAKAD which has been used so far at ITSK. The evaluation model proposed in this research is the Technology Acceptance Model (TAM), which is a model that provides perceptions based on the experiences experienced by users. This research used a questionnaire instrument which was distributed to all SIAKAD ITSK users. The expected result is a positive percentage that will describe the correct system performance and a negative percentage that can be an input for further improvements to SIAKAD ITSK.

1. Introduction

The use of information technology is experiencing rapid development. The increasingly mature era of digitalization is marked by the increasing use of technology and the level of adaptation of technology users who cannot be far from technology-based tools. The use of IT in everyday life is needed to support activities such as data processing, image and video processing and so on. IT services that are generally used to support activities in an organization are information systems. Information system is a collection of related data flows that are then processed from input, processed, and treated to be stored so that it becomes information that meets the objectives of the system [1]. The application of IS is used in the financial sector [2], education [3] [4] to support the performance of MSMEs [5], the health sector [6], and so on.

Education is one of the fields that is also developing because of technology. In higher education, technology is applied to process academic data or is generally called an academic information system (SIAKAD) [7][8]. SIAKAD is tasked with processing data on scheduling academic, financial and administrative activities related to the teaching and learning process on campus. The existence of this system supports the presentation of information to lecturers and students. In implementing SIAKAD in various educational institutions, there are bound to be obstacles. Institut Teknologi, Sains, dan Kesehatan RS dr. Soepraoen Malang (ITSK dr. Soepraoen Malang) is an educational institution that has implemented SIAKAD. Its use occasionally experiences access problems due to various reasons, one of which is network access failure. The solution provided by ITSK RS dr. Soepraoen is optimizing network performance and evaluating SIAKAD internally. To improve the application of IT that has been operating for a long time, evaluation is needed.

Obstacles in implementing SIAKAD will be of particular concern because the need for its implementation to support the performance of the teaching and learning process is considered important. Therefore, this research aims to evaluate the use of SIAKAD focuses on the level of user acceptance of overall system performance.

There are various methods that can be used to evaluate system performance. In general, what is needed is a method that has a psychological approach so that the evaluation results will reflect the habits and acceptance or rejection of the recipient. With a method like this, the evaluation results can be directly described clearly. One method that involves the user's psychology as an encouragement for the tendency to accept the use of technology is the Technology Acceptance Model method or generally called TAM [9]. This method is the easiest method to apply because the evaluation results are obtained directly from the end user's perception.

2. Research Method

This research evaluates SIAKAD with a case study at ITSK dr. Soepraoen Malang. The evaluation method applied is TAM (Technology Acceptance Model).

2.1 TAM Model

TAM theory is a theory that uses an approach to behavior or habits towards adaptation to information technology [10]. TAM was developed by Davis in 1989 which was previously the Theory of Reasoned Action (TRA) model. The TAM theory was developed by emphasizing a perception in the use of technology based on 2 points of view, namely ease of use perception and usefulness perception [10].

2.1.1 Ease of Use (Easy of Use Perceived)

Perception of ease in the TAM model is a statement about the user's perceived level of ease in using information technology, in this case SIAKAD. This can be described by indicators that are easy to understand, easy to achieve goals with this system, and clear in use.

2.1.2 Usefulness of Use (Usefulness Perceived)

User perceptions stated based on indicators that describe that SIAKAD has the benefit of speeding up the work process, making work easier, increasing the level of work productivity, and increasing effectiveness in completing work. Perceived ease of use or perceived ease of use and perceived usefulness manifest user acceptance of information technology as in Figure 1.

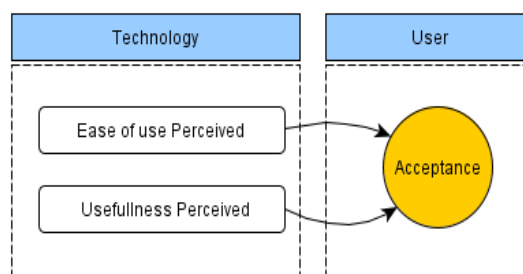


Figure 1. TAM evaluation model

Based on the research model in Figure 1, there are factors that influence user acceptance, namely ease of use (Ease of use perception) and usefulness (usefulness perception), so there are several indicators used to form questions in the questionnaire, namely in Table 1.

Table 1. Evaluation indicators according to the TAM model

Variables	Indicators
Ease of Use (<i>Ease of Use perceived</i>)	1. The information technology applied is easy to use (<i>ease of use</i>) 2. The technology applied is easy to understand (<i>Ease to learn</i>) 3. The IT implementation is understandable by any user (<i>clear/understandable</i>).
Usefulness of Use (<i>Usefulness Perceived</i>)	1. Shortening the work duration (<i>work more quickly</i>) 2. Simplifying the working process (<i>makes jobs easier</i>) 3. Increasing work productivity (<i>increase productivity</i>) 4. Making works more effective (<i>effectiveness</i>)

2.2 Population and Sample

This research was conducted using qualitative research methods. The research began by distributing questionnaires to the entire population of ITSK RS Dr. Soepraoen's students from semesters 1-13. Based on the population, there were 287 sample respondents who provided responses regarding the use of SIAKAD. Respondents consisted of lecturers, students, and teaching staff at ITSK Dr. Soepraoen. The questionnaire is presented by giving respondents the opportunity to answer based on a Likert scale. The score is 1 (one) for strongly disagreement, 2 (two) for disagreement, 3 (three) for agree and 4 (four) for strongly agree. There are 36 questions to be used to measure indicators of ease of use (Ease of Use perception) and usefulness of use (Usefulness perception).

2.3 Instrument Testing

The instrument used is a questionnaire whose level of validity and reliability needs to be ensured. This needs to be done to ensure that the results of the evaluation are based on valid and reliable data. Validity Test is a measure that can provide an explanation of the validity of an instrument by knowing the strength or weakness of a relationship between research variables [11]. The data validity test method is carried out using the Pearson correlation coefficient

method. This method states whether the data is valid or not by comparing the value of the data validity results with the r table value. The following is the Pearson correlation coefficient test equation in equation 1.

$$r_{\text{count}} = \frac{n(\sum XY) - (\sum X) \cdot (\sum Y)}{\sqrt{\{n \cdot \sum X^2 - (\sum X)^2\} \cdot \{n \cdot \sum Y^2 - (\sum Y)^2\}}} \quad (1)$$

Information:

r_{count} = Correlation coefficient
 $\sum Xi$ = Total item scores
 $\sum Yi$ = Total score (all items)
 n = number of respondents

To determine the validity of the data, there is a decision rule based on the 't' table for $\alpha = 0.05$ and degrees of freedom ($dk = n - 2$) so, if $r_{\text{count}} > r_{\text{table}}$ means it is valid; or if $r_{\text{count}} < r_{\text{table}}$ means it is invalid. There is an interpretation of the correlation coefficient of r value. Meanwhile, the data reliability test is a test carried out on the instrument so that the level of consistency of the instrument can be determined. Reliability testing also ensures that the data can be reused even in different conditions. The data reliability test method used is the Cronbach's Alpha method. The following is Cronbach's Alpha test on equation 2.

$$r_{11} = \left(\frac{k}{k-1} \right) \cdot \left(1 - \frac{\sum Si}{St} \right) \quad (2)$$

Information:

r_{11} = Reliability value
 $\sum Si$ = Total variance in scores for each item
 St = Total variance
 K = number of items

In determining the level of reliability of data, there is a decision rule based on the r table for significance $\alpha = 0.05$ then, if $r_{11} > r_{\text{table}}$ means it is reliable; or if $r_{11} < r_{\text{table}}$ means it is not reliable. There is an interpretation of the reliable coefficient criteria [11]. These two methods were used because the questionnaire used in this study used data with Likert number values which means that each number has a graded meaning such as strongly disagree, disagree, agree and finally strongly agree.

3. Results and Discussion

The use of questionnaire instruments to carry out evaluations using the TAM model requires validity and reliability tests so that it can be ensured that an instrument is valid and reliable to be used as an evaluation instrument. Based on the construct validity test in this research using the Pearson correlation coefficient. Meanwhile, the reliability test uses Cronbach's Alpha equation.

3.1 Instrument Test Result

Based on the results of the construct test on the TAM evaluation instrument using the Pearson correlation coefficient method, a value of 0.965 was produced, the correlation level was produced with a significance value of 0.05 then it includes a very high correlation. Construct validity is declared valid. The results of the data reliability test using the Cronbach's Alpha test produced a value of 0.975 or was declared reliable because the resulting value of 0.975 was higher than the determined value of 0.60. The data used is declared reliable.

3.2 TAM Method Evaluation Result

In its application, the TAM model classifies 2 main indicators, in which there are supporting factors or sub-indicators that influence the main indicators.

3.2.1 Ease of Use (Easy of Use Perceived)

a. Easy to use

On the ease-of-use indicator, evaluation of SIAKAD was carried out based on user perceptions of SIAKAD. The question asked was "Is SIAKAD easy to use?" Based on these questions, a recapitulation of the percentage of answers from SIAKAD users was produced in Figure 2. Based on a data sample of 287 users, 49.8% of SIAKAD users strongly agree that SIAKAD is easy to use (Ease of Use), while 43.2% agree, there is a 6.3% negative percentage or disagree that SIAKAD is easy used and finally 0.7% of users strongly disagree that SIAKAD is easy to use.

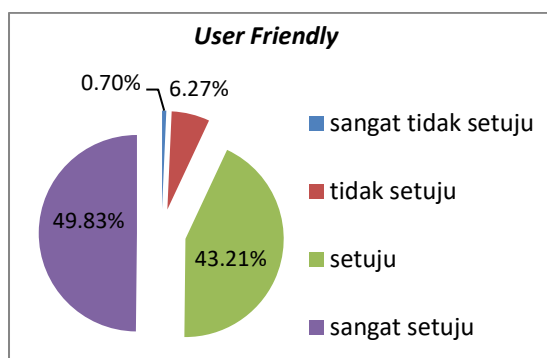


Figure 2. Ease of using SIAKAD dr. Soepraoen

b. Clear or easy to understand (clear/understandable)

In the clear/understandable indicator, SIAKAD evaluation was carried out based on user perceptions of SIAKAD. The question asked was about "The information produced by SIAKAD is precise and accurate." Based on this question, a recapitulation of the percentage of answers from SIAKAD users was produced in Figure 3. Based on a data sample of 287 users, 55.05% of SIAKAD users strongly agree that SIAKAD is easy to use (Ease of Use), while 38.33% agree, there is a 5.92% negative percentage or disagree that SIAKAD is easy to use and finally 0.70% of users strongly disagree that SIAKAD is easy to use.

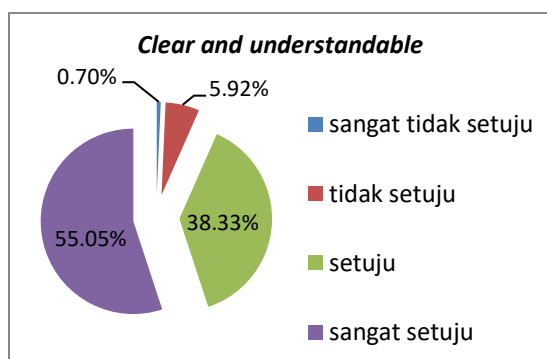


Figure 3. SIAKAD diagram is clear and easy to understand

3.2.2 Benefit of Use (Usefulness Perceived)

a. Facilitating the work process (Makes jobs easier)

In the make jobs easier indicator, SIAKAD evaluation was carried out based on user perceptions from SIAKAD. The question asked was about "SIAKAD helps in decision making." Based on this question, a recapitulation of the percentage of answers from SIAKAD users was produced in Figure 4.

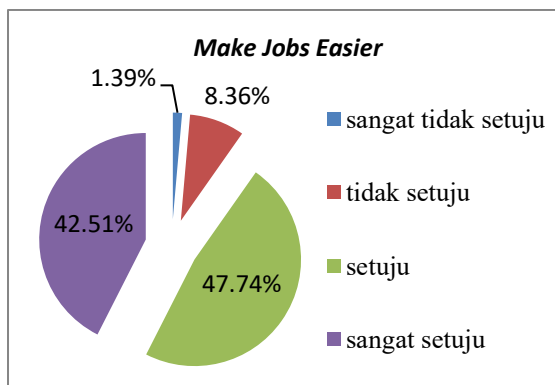


Figure 4. 'Makes jobs easier' diagram indicator

In Figure 4, based on data from 287 users with a percentage of 47.74% of users agreeing that SIAKAD has a perception of usefulness that can support ease of doing work in this case helping decision making. While 42.51% said they strongly agreed, there was an 8.36% negative percentage or said they disagreed if SIAKAD is easy to use and finally 1.39% of users strongly disagreed.

b. Increase work productivity (Increase productivity)

On the productivity increase indicator, SIAKAD evaluation was carried out based on user perceptions from SIAKAD. The question asked was about "SIAKAD helps in decision making." Based on this question, a recapitulation of the percentage of answers from SIAKAD users was produced in Figure 5. In Figure 5, based on data from 287 users with a percentage of 47.74% of users agreeing that SIAKAD helps in decision making, which means SIAKAD has a perception of usefulness thereby increasing work productivity. Meanwhile, 47.39% said they strongly agreed, there was a 4.18% negative percentage or said they did not agree that SIAKAD was easy to use and finally 0.70% of users strongly disagreed.

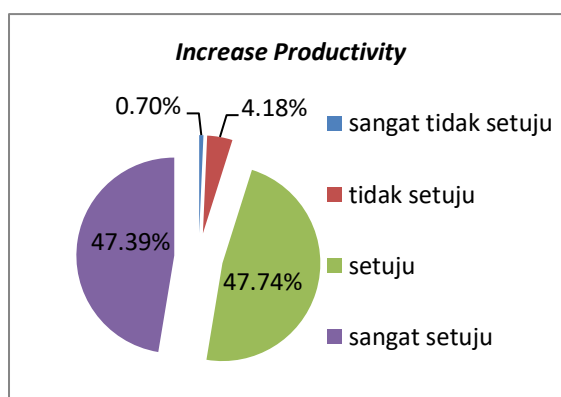


Figure 5. Increase productivity diagram indicator

c. Work becomes more effective

In terms of effectiveness indicators, evaluation of SIAKAD was carried out based on user perceptions of SIAKAD. The question asked was about "SIAKAD helps work more effectively and efficiently." Based on this question, a recapitulation of the percentage of answers from SIAKAD users was produced in Figure 6.

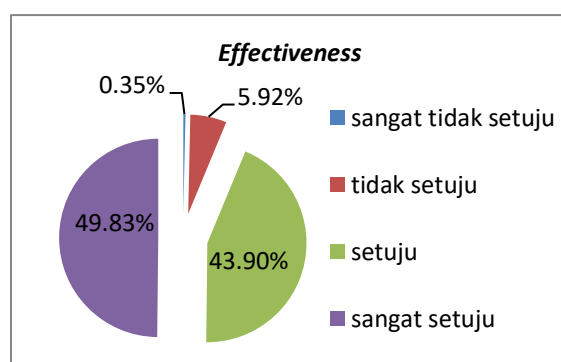


Figure 6. Effectiveness indicator

Based on Figure 6, analysis of a data sample of 287 users, 49.83% of SIAKAD users strongly agree that SIAKAD increases work effectiveness (effectiveness), which means that SIAKAD has a perception of being useful in work effectiveness. Meanwhile, 43.2% said they agreed, there was a 6.3% negative percentage or said they did not agree that SIAKAD was easy to use and finally 0.7% of users strongly disagreed that SIAKAD was easy to use.

4. Discussion

Based on the results of data processing, the application of SIAKAD has a positive influence on providing convenience and benefits to the performance of educational provision at the institution. But there are also quite a few

who give a negative percentage to provide input that can be brought into the improvement process for SIAKAD ITSK Dr. Soepraoen. In an evaluation application, there needs to be a ranking or the main focus for improvement [12]. This can be seen from the obstacles that have the possibility of generating higher risks, so repairs need to be carried out first. As for its implementation, it requires risk identification so that in the subsequent evaluation process risk analysis and treatment can be carried out at high risks.

5. Conclusion

Based on data processing and discussions related to the TAM model applied to the evaluation of the use of SIAKAD has distributed it to all SIAKAD users and there were 287 respondents who sent their responses. The TAM model carries out evaluations by looking at user perceptions based on 2 main indicators, namely perceived ease of use (Ease of Use Perceived) and perceived usefulness (Usefulness Perceived). In this research, ease of use perceptions was evaluated using several sub-indicators, namely ease of use and clear/understandable. Based on the ease-of-use sub-indicator, 49.8% of 287 users strongly agree that SIAKAD has the perception of being easy to use and 55.05% of users from 287 respondents strongly agree that SIAKAD in its application is clearly easy to understand. Meanwhile, 6.3% of users still feel that there are shortcomings which result in them not being able to give the perception that SIAKAD is easy to use. This becomes evaluation material for further development of SIAKAD.

The perceived usefulness (Usefulness Perceived) is evaluated based on several sub-indicators, namely the usefulness of SIAKAD which results in ease of work (make jobs easier), increases productivity (increase productivity), and effectiveness (Effectiveness). Based on the results of data processing on sub-indicators of perceived usefulness from 287 users, 47.74% agreed that SIAKAD supports making work easier. Meanwhile, in the sub-indicator of increasing work productivity (increase productivity), 47.74% strongly agreed that SIAKAD increased work productivity and 49.89% strongly agreed that using SIAKAD completed work effectively. As for negative perceptions, 8.36% did not agree that SIAKAD made work easier, 4.18% did not agree that implementing SIAKAD could increase work productivity and 6.3% said they did not agree that there was effectiveness in implementing SIAKAD. The existence of a negative perception regarding the perception of usefulness can be an evaluation for the future development of SIAKAD, so that it can implement an academic system that can include better convenience and benefits.

References

- [1] YG. A. O'Brien, James M. Marakas, *Management Information Systems*, vol. 111, no. 479. 2011.
- [2] I. Ava Dianta, E. Zusrony, and S. Tinggi *Elektronika dan Komputer*, "Analisis Pengaruh Sistem Keamanan Informasi Perbankan pada Nasabah Pengguna Internet Banking Analisis of Influence of Banking Information Security System to Internet Banking User Customer," *Intensif*, vol. 3, no. 1, pp. 2549–6824, 2019. DOI: <https://doi.org/10.29407/intensif.v3i1.12125>
- [3] L. Dewi, A. Sains, K. & Adib, N. Asy'ari, A. S. Kharisma, and A. N. Asy'ari, "Evaluasi Tingkat Penerimaan E-Learning Pada Mahasiswa Bidang Keilmuan Sosial Dan Teknik Dengan Technology Acceptance Model (Tam) Evaluation Of E-Learning Acceptance Levels in Students in The Social and Technique Science with Technology Acceptance Model (T)," *J. Pendidik. Akunt. Indones.*, vol. 18, no. 1, pp. 1–11, 2020. DOI: [10.21831/jpai.v18i1.27336](https://doi.org/10.21831/jpai.v18i1.27336)
- [4] R. Chocarro, M. Cortiñas, and G. Marcos-Matás, "Teachers' attitudes towards chatbots in education: a technology acceptance model approach considering the effect of social language, bot proactiveness, and users' characteristics," *Educ. Stud.*, 49(2), pp. 1–19, 2021. DOI: [10.1080/03055698.2020.1850426](https://doi.org/10.1080/03055698.2020.1850426)
- [5] E. Magdalena Sipayung, C. Fiarni, and Wawan, "Evaluasi Penggunaan Aplikasi Point of Sale Menggunakan Technology Acceptance Model pada UMKM," *J. Nas. Tek. Elektro dan Teknol. Inf.*, vol. 9, no. 1, pp. 18–24, 2020. DOI: [10.22146/jnteti.v9i1.116](https://doi.org/10.22146/jnteti.v9i1.116)
- [6] D. S. H. Putra and R. Kurniawati, "Evaluasi Sistem Informasi Manajemen Rumah Sakit Dengan Metode Technology Acceptance Model (TAM) di Rumah Sakit X," (*J-REMI*) *Jurnal Rekam Medis dan Informasi Kesehatan*, vol. 1, no. 1, pp. 31–36, 2019. DOI: <http://dx.doi.org/10.33757/jik.v6i2.559>
- [7] R. Wahyudi, E. S. Astuti, and Riyadi, "Pengaruh Kualitas Sistem, Informasi dan Pelayanan Siakad terhadap Kepuasan Mahasiswa (Studi pada Mahasiswa Program Sarjana Fakultas Ilmu Administrasi, Universitas Brawijaya)," *Jurnal Administrasi Bisnis (JAB)*, vol. 23, no. 2, pp. 28–39, 2015.
- [8] F. S. Rahayu, D. Budiyanto, and D. Palyama, "Analisis Penerimaan E-Learning Menggunakan Technology Acceptance Model (TAM) (Studi Kasus: Universitas Atma Jaya Yogyakarta)," *Jurnal Terapan Teknologi Informasi*, vol. 1, no. 2, pp. 87–98, 2017. DOI: <https://doi.org/10.21460/jutei.2017.12.20>
- [9] F. D. Davis, R. P. Bagozzi, and P. R. Warshaw, "User acceptance of information technology: a comparison of two theoretical models," *Management Science*, vol. 35, no. 8, pp. 982–1003, 1989. DOI: [10.1287/mnsc.35.8.982](https://doi.org/10.1287/mnsc.35.8.982)
- [10] F. D. Davis, "Perceived usefulness, perceived ease of use, and user acceptance of information technology," *MIS Q. Manag. Inf. Syst.*, vol. 13, no. 3, pp. 319–339, 1989. DOI: [10.2307/249008](https://doi.org/10.2307/249008)
- [11] Riduwan, *Metode dan Teknik Menyusun Tesis*. Bandung: Alfabeta, 2018.
- [12] R. V. Bradley and R. M. E. Pratt, "Exploring the relationships among corporate entrepreneurship, IT governance, and risk management," *Proc. Annu. Hawaii Int. Conf. Syst. Sci.*, pp. 11–12, 2011. DOI: [10.1109/HICSS.2011.203](https://doi.org/10.1109/HICSS.2011.203)