

User Acceptance of SIPINTAR for Final Project Management Using Extended TAM

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ABSTRACT

Academic information systems play an important role in supporting effective and efficient higher-education management. Universitas Negeri Surabaya developed SIPINTAR (Academic Mobility and Final Project Management Information System) to replace SIMONTASI, which has been officially used since 2025 to manage the entire final-project process for students. Although SIPINTAR has strong potential to improve the efficiency of academic processes, no study has specifically examined user acceptance of the system. This study aims to analyze the influence of Extended Technology Acceptance Model (TAM) constructs, with the addition of subjective norm and job relevance as external variables, on user acceptance of SIPINTAR in the final-project module. A quantitative approach was employed using Partial Least Squares Structural Equation Modeling (PLS-SEM) processed with SmartPLS 4. Data were collected through a questionnaire distributed to 133 respondents consisting of students, lecturers, and study program coordinators who use SIPINTAR. The results show that six of the seven hypotheses were supported; subjective norm, perceived ease of use, and perceived usefulness were found to significantly shape attitude, intention, and actual system use, while the effect of job relevance on perceived usefulness was not significant. Overall, SIPINTAR has been well accepted by its users, driven mainly by ease of use, perceived usefulness, and social influence from the academic environment. These findings are expected to serve as an evaluation basis for Universitas Negeri Surabaya and system developers to improve the quality and effectiveness of SIPINTAR going forward.

Keyword: SIPINTAR, User Acceptance, Extended TAM, Subjective Norm, Job Relevance, PLS-SEM.

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1. INTRODUCTION

Digital transformation in the higher-education sector encourages institutions to continuously update their academic information systems in order to keep pace with technological developments and increasingly complex management needs. An academic information system is a system that produces academic data and information services, developed by adapting an institution's ongoing business processes to streamline and improve the quality of academic services [1]. However, the implementation of academic information

systems does not always run smoothly, as the challenges that arise relate not only to system development but also to the level of user acceptance of the system [2].

Universitas Negeri Surabaya (UNESA) is one of the higher-education institutions in Indonesia that has implemented an academic information system to support various educational activities. One such implementation is SIPINTAR (Academic Mobility and Final Project Management Information System), which has been officially used since 2025 as the primary platform for managing the entire final-project process, from topic submission, supervisor assignment, and document upload, to online monitoring of final-project progress. SIPINTAR was developed in response to a change in the final-project business process, which previously used SIMONTASI, whereby the final project is no longer treated as a course but is instead categorized as a conversion-based academic activity, in line with adjustments to academic reporting policy under PDDIKTI.

Although SIPINTAR has strong potential to improve the efficiency of academic processes, to date no study has specifically examined the level of user acceptance following the transition of final-project management from the previous system. This analysis is important to determine the extent to which the system can meet user needs and support the final-project management process optimally and sustainably. User acceptance is a critical factor that influences the success of a technology implementation, so the factors that determine user acceptance also determine the success or failure of a system implementation.

One of the models widely used to analyze technology acceptance is the Technology Acceptance Model (TAM) developed by Davis [3], which explains that technology acceptance is influenced by two main constructs, namely perceived usefulness and perceived ease of use. This model has been widely used and has proven capable of explaining user behavior in accepting various information systems, but it has a limitation in that it does not explain the external factors that shape a user's perceived usefulness. This limitation becomes more relevant when the model is applied to a mandatory system such as SIPINTAR, because users have no choice about whether to use the system, so factors beyond individual perception also influence technology acceptance. To address this limitation, Venkatesh and Davis [4] developed Technology Acceptance Model 2 (TAM2) by adding external determinants that influence perceived usefulness and intention to use, grouped into social influence processes (subjective norm) and cognitive instrumental processes (job relevance, output quality, and result demonstrability).

This study adopts two external variables from TAM2, namely subjective norm and job relevance. Subjective norm was chosen because the use of SIPINTAR is an institutional policy that is mandatory for all students undertaking a final project at UNESA, so that system acceptance is influenced not only by individual perception but also by social influence from supervisors, study program coordinators, and fellow students. Venkatesh and Davis [4] explain that the influence of subjective norm on perceived usefulness and intention to use tends to be stronger for mandatory system use than for voluntary use, a finding also reinforced by research on the implementation of the mandatory Coretax system [5]. In addition, this study adopts the job relevance variable because SIPINTAR is designed to support user needs according to each user's role, in line with research in the context of Indonesian higher-education information systems that found job relevance to have a positive effect on perceived usefulness [6]. Accordingly, this study aims to analyze the influence of each construct in the Extended Technology Acceptance Model (TAM), integrated with subjective norm and job relevance, on user acceptance of the SIPINTAR system in the final-project module.

2. METHODS

This study used a quantitative method with an explanatory research approach to explain the relationships and effects among the variables in the research model, in order to test the formulated hypotheses. The research model applied is the Extended Technology Acceptance Model (TAM), consisting of the five core TAM constructs -- Perceived Ease of Use (PE), Perceived Usefulness (PU), Attitude Toward Using (ATU), Behavioral Intention to Use (BIU), and Actual Use (AU) -- plus two external variables from TAM2, Subjective Norm (SN) and Job Relevance (JR), both assumed to influence Perceived Usefulness. The overall research flow, covering problem identification, literature review, model and hypothesis formulation, questionnaire design, pilot testing, data collection, and data analysis, is illustrated in Figure 1.

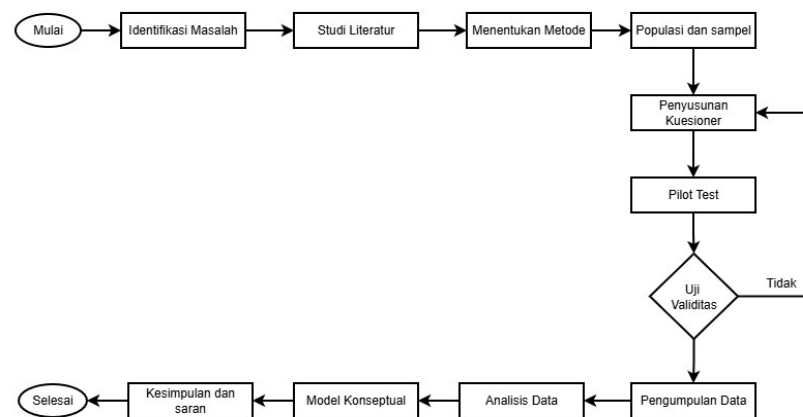


Figure 1. Research Flow

The population of this study consisted of all SIPINTAR users in the final-project module at UNESA, namely students, lecturers, and study program coordinators (koorprodi), with the sample determined using purposive sampling. The minimum sample size was calculated using the 10-times rule based on the construct with the largest number of indicators (four indicators for Perceived Ease of Use), yielding a minimum of 40 respondents; to obtain more optimal results, this study set a sample of 133 respondents, consisting of 123 students, 9 lecturers, and 1 study program coordinator.

The research instrument was a questionnaire [8] developed from the indicators of the seven research constructs, measured on a 1-5 Likert scale (strongly disagree to strongly agree), and distributed online via Google Form. Before the main data collection, a pilot test was conducted on 30 respondents [9] to test convergent validity ($AVE > 0.5$) and construct reliability (Composite Reliability > 0.7) [10], the results of which showed that all constructs met these criteria. The collected data were then analyzed using the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach [11] with SmartPLS 4 software, through the stages of descriptive analysis, measurement model (outer model) evaluation, structural model (inner model) evaluation, and hypothesis testing using the bootstrapping method, examining t-statistic and p-value at a 5% (two-tailed) significance level.

3. RESULTS AND DISCUSSION

This section presents the research findings obtained through the data collection, processing, and analysis process described in the previous section. The analysis was conducted to test the constructs in each hypothesis based on the Extended Technology Acceptance Model (TAM) using the PLS-SEM approach.

3.1 Respondent Characteristics

The total number of respondents was 133, consisting of 123 students (92.5%), 9 lecturers (6.8%), and 1 study program coordinator (0.8%). Respondents came from 11 faculties/postgraduate programs at UNESA, with the largest proportion from the Faculty of Engineering (21.1%), followed by the Faculty of Languages and Arts (13.5%), and the Faculty of Mathematics and Natural Sciences and the Faculty of Education, each accounting for 12%. This distribution indicates that the research data were dominated by student users with diverse faculty backgrounds.

3.2 Measurement Model (Outer Model) Evaluation

Outer model evaluation was conducted to test the validity and reliability of the instrument through outer loading, Average Variance Extracted (AVE), and Composite Reliability (CR) values [13]. The measurement model estimated in SmartPLS 4, covering the seven constructs and their indicators, is shown in Fig. 2.

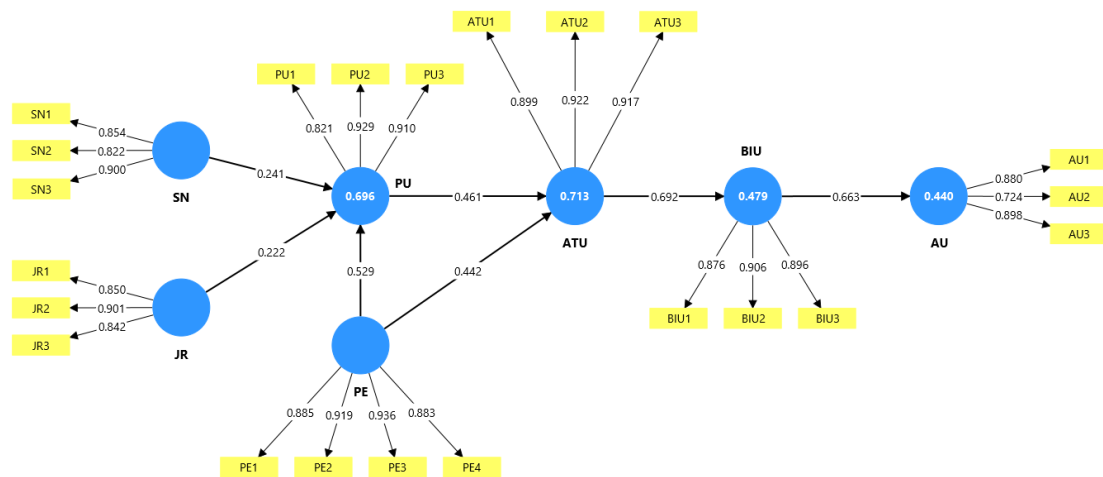


Figure 2. Outer Model

All indicators had outer loading values above 0.70 and were therefore declared valid. A summary of the AVE and CR values for the seven constructs is presented in Table 1.

Table 1. Summary of Average Variance Extracted (AVE) and Composite Reliability (CR)

Construct	AVE	CR (rho_c)	Remarks
ATU	0.833	0.937	Valid & Reliable
AU	0.702	0.875	Valid & Reliable
BIU	0.796	0.921	Valid & Reliable
JR	0.748	0.899	Valid & Reliable
PE	0.821	0.948	Valid & Reliable
PU	0.788	0.918	Valid & Reliable
SN	0.738	0.894	Valid & Reliable

All constructs had AVE values above 0.50 and CR values above 0.70, so all constructs were declared to meet the criteria for convergent validity and good reliability. Discriminant validity testing through the Fornell-Larcker criterion, cross loading, and the Heterotrait-Monotrait Ratio (HTMT) likewise showed that each indicator had its highest loading on its own construct, so all constructs were declared discriminantly valid.

3.3 Structural Model (Inner Model) Evaluation

Inner model evaluation was carried out through path coefficient (β) and coefficient of determination (R^2) testing. A path coefficient is declared significant if the P value is < 0.05 [11]. The test results are shown in Table 2.

Table 2. Path Coefficient and Coefficient of Determination (R^2) Results

Path / Construct	Coefficient (β) / R^2	P values	Remarks
SN $\rightarrow$ PU	0.241	0.009	Significant
JR $\rightarrow$ PU	0.222	0.081	Not Significant
PE $\rightarrow$ PU	0.529	0.000	Significant
PE $\rightarrow$ ATU	0.442	0.000	Significant
PU $\rightarrow$ ATU	0.461	0.001	Significant
ATU $\rightarrow$ BIU	0.692	0.000	Significant
BIU $\rightarrow$ AU	0.663	0.000	Significant
R^2 ATU	0.713	-	Strong
R^2 PU	0.696	-	Strong
R^2 BIU	0.479	-	Moderate
R^2 AU	0.440	-	Moderate

The strong, moderate, and weak categories for R^2 refer to the thresholds of 0.67 (strong), 0.33 (moderate), and 0.19 (weak) [12]. The results show that PU and ATU have strong explanatory power (R^2 of 0.696 and 0.713, respectively), while BIU and AU fall into the moderate category. Overall, six of the seven hypothesized paths were found to be significant, with the exception of the JR $\rightarrow$ PU path.

3.4 Hypothesis

Hypothesis testing was conducted using the bootstrapping method at a 5% (two-tailed) significance level, where a hypothesis is supported if the T-statistic > 1.96 and the P value < 0.05 . A summary of the results for the seven hypotheses is presented in Table 3.

Table 3. Summary of Hypothesis Testing Results

Hypothesis	Path	T-statistics	P values	Decision
H1	SN $\rightarrow$ PU	2.631	0.009	Supported
H2	JR $\rightarrow$ PU	1.745	0.081	Not Supported
H3	PE $\rightarrow$ PU	7.026	0.000	Supported
H4	PU $\rightarrow$ ATU	3.346	0.001	Supported
H5	PE $\rightarrow$ ATU	3.518	0.000	Supported
H6	ATU $\rightarrow$ BIU	10.330	0.000	Supported
H7	BIU $\rightarrow$ AU	17.732	0.000	Supported

The results show that Subjective Norm has a significant effect on Perceived Usefulness (H1 supported), meaning that encouragement from lecturers, peers, and the institution significantly influences users' perceived usefulness, consistent with SIPINTAR's status as a mandatory system [4]. Perceived Ease of Use was found to significantly influence both Perceived Usefulness (H3) and Attitude Toward Using (H5), showing that ease of use directly contributes to users' perceived usefulness and attitude. Perceived Usefulness also significantly influenced Attitude Toward Using (H4), Attitude Toward Using significantly influenced Behavioral Intention to Use (H6), and Behavioral Intention to Use significantly influenced

Actual Use (H7), so that acceptance of SIPINTAR is formed in stages, from perceived ease of use and usefulness, through attitude and intention, to actual use.

In contrast to the other relationships, Job Relevance was not found to significantly influence Perceived Usefulness (H2 not supported). Several possible explanations underlie this finding. First, the use of SIPINTAR is mandatory for all students undertaking a final project, so the decision to use the system is not based on personal judgment about task relevance but on the obligation to follow academic procedure. Venkatesh and Davis [4] found that cognitive instrumental determinants such as job relevance tend to contribute more strongly to perceived usefulness at a later stage of use (post-implementation), once users have gained sufficient experience with the system, compared with the early stage of use. Given that SIPINTAR was only officially implemented in 2025, the respondents in this study are likely still at an early stage of system use. Second, this finding is also reinforced by qualitative feedback from respondents indicating that several steps and features in SIPINTAR are still confusing, including menu options that appear similar or overlapping in function, so that users have not yet been able to fully connect the available features with the specific needs of the final-project module. This finding is consistent with results from other research in the context of Indonesian higher-education information systems [6], which confirms that the strength of job relevance's effect on perceived usefulness depends on the extent to which users already understand how the system's features relate to their task needs.

CONCLUSION

The Extended Technology Acceptance Model (TAM), integrated with subjective norm and job relevance, was found to be appropriate and capable of explaining user acceptance of the SIPINTAR Information System in final-project management, both in terms of the quality of the measurement instrument and the model's ability to explain the relationships among the research constructs. User acceptance of SIPINTAR is formed through a pathway from Perceived Ease of Use and Perceived Usefulness, which then shape Attitude Toward Using, drive Behavioral Intention to Use, and ultimately materialize as Actual System Use, with Subjective Norm further reinforcing Perceived Usefulness given SIPINTAR's mandatory nature. In contrast, Job Relevance was not found to play a role in shaping Perceived Usefulness in the context of this study, which is thought to be due to SIPINTAR having only been officially implemented in 2025, so that users are still at an early stage of use and have not yet been able to fully connect the system's features with the specific needs of their final project. Accordingly, user acceptance of SIPINTAR is more strongly shaped by Perceived Ease of Use, Perceived Usefulness, and Subjective Norm than by Job Relevance, and the research objective of analyzing the influence of TAM constructs, integrated with subjective norm and job relevance, on user acceptance in the SIPINTAR final-project module has been achieved. Future research is recommended to expand the number and proportion of lecturer and study program coordinator respondents, and to consider adding other variables such as System Quality, Information Quality, or Trust to enrich the understanding of the factors influencing acceptance of the SIPINTAR Information System.

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