
User Satisfaction Analysis of the e-Semesta Application at UIN Syarif Hidayatullah Jakarta Using the Technology Acceptance Model (TAM)

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Abstract

As a result of the digital transformation implemented in the higher education setting, UIN Syarif Hidayatullah Jakarta developed the comprehensive, all-in-one academic information system in the form of e-Semesta application. However, high functionality does not necessarily imply high satisfaction from end users of the software. This research models the direct influence of perceived usefulness and perceived ease of use on user satisfaction within the context of the e-Semesta application. Deploying a mixed-methods design, this study gathered survey data from 397 institutional stakeholders, comprising students, lecturers, and administrative staff utilizing purposive convenience sampling. Quantitative responses were evaluated via multiple linear regression, while qualitative feedback underwent word frequency analysis. The novel methodological approach were utilized to rapidly and objectively isolate specific operational bottlenecks. Our analysis demonstrates that PU and PEOU serve as robust predictors of user satisfaction. Whether evaluated individually or through joint estimation, both constructs positively influence the outcome, explaining 88.6% of the variance in satisfaction scores. However, this high explanatory power must be contextualized, as it is partially amplified by Common Method Bias and the sampling method used. Despite the strong predictive metrics, the level of user satisfaction remains at a moderate level. The qualitative analysis reveals the primary obstacles are issues within the back-end server infrastructure, such as login failures and slow networks, despite the high level of both PU and PEOU. Therefore, the institution should improve the back-end infrastructure of the application before focusing on enhancing other functionalities.

Keywords: Technology Acceptance Model; Word Frequency Analysis; Digital Transformation; User Satisfaction

1. Introduction

Digital transformation in the higher education era is an inevitability in the current Industrial Revolution 4.0 age. Every university is required to offer information technology-based services and find new ways for facilitating a variety of services to be deemed competitive as a key player of the digital transformation in higher education landscape [1]. Thus, in an effort to better adapt to the digital transformation, State Islamic University (UIN) Syarif Hidayatullah Jakarta has developed a new academic information system called e-Semesta to replace the outdated AIS system implemented by the institution. The new system implemented promised to integrate and merge a variety of academic, administrative, and student services, all in one solution. However, the implementation of an application is only deemed successful when the users are satisfied using it in its intended purpose. Many information system applications that have comprehensive services for the users are met with various barriers consisting of lack of digital literacy, adequate IT infrastructure, strategic planning, or budget [2]. Currently, the e-Semesta application has already been implemented and actively being used for over a year. However, there is still a lack of a comprehensive understanding of the level of satisfaction of the users of the application, and the factors that pose obstacles to their utilization of the application.

To evaluate the success of the app in terms of acceptance and satisfaction of the implemented system, one of the most relevant and often utilized theories in information systems is the Technology Acceptance Model (TAM) [3]. The model specifies that there are two main constructs to for an IT system to be

considered to be accepted which are Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). The significance of these two main constructs on the overall satisfaction of a system has been proven in a variety of previous studies. For instance, a quantitative study by Wandira et al. (2024) found that user satisfaction is the most dominant factor that influences the decision of users to utilize a system [4]. Furthermore, another study by Sayardoost Tabrizi et al. (2023) found that the two constructs of TAM which are ease of use and usefulness of a system had a positive correlation with the satisfaction of the students who were utilizing the online learning platforms [5]. However, not all studies have revealed the same results, Swe & Yang (2024) found that ease of use did not have any direct impact upon user satisfaction, though ease of use did have an impact upon satisfaction if the system was also considered to be useful [6].

While most previous studies used either purely qualitative or purely quantitative techniques to observe users' opinions of a system, the techniques utilized in this research employ quantitative methods to determine ease of use and usefulness of the system, as well as qualitative analysis using Word Frequency Analysis (Word Cloud) to prioritize actions that may improve the overall satisfaction from users' open-ended survey questions.

Thus, this study serves a threefold purpose. (1) To systematically gauge aggregate user satisfaction with the platform, (2) to quantify the specific variances driven by perceived usefulness and perceived ease of use, (3) to isolate operational bottlenecks to optimize the user experience. Ultimately, these findings enrich the broader literature on information systems deployment, offering targeted insights for higher education frameworks

2. Research Methodology

a. Research Design

This study paired a dominant quantitative survey design with supportive qualitative analysis to form a mixed-methods framework. The quantitative method was used to measure and analyze the degree of user satisfaction with the e-Semesta application at UIN Syarif Hidayatullah Jakarta. Concurrently, the qualitative approach was applied through word frequency analysis on the respondents' open-ended answers to identify the main technical obstacles and suggestions for feature development. The research was conducted at the UIN Syarif Hidayatullah Jakarta campus between September 2025 and December 2025.

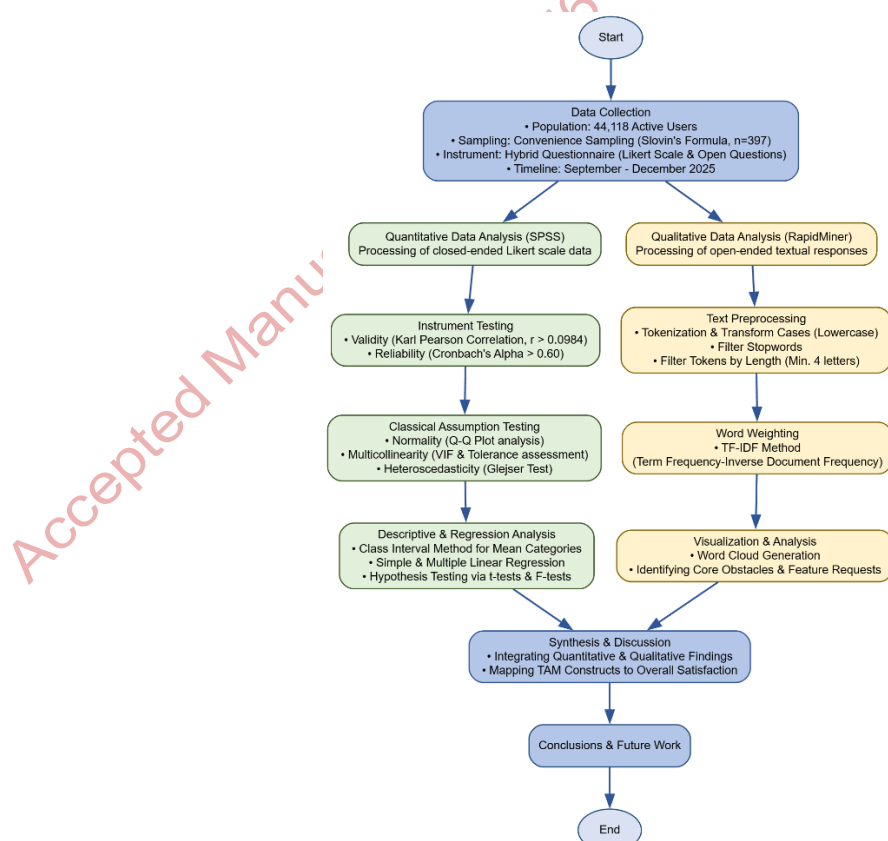


Figure 1. Research Flow

b. Population and Sampling

The target population encompasses the entire active user base of the e-Semesta platform within the UIN Syarif Hidayatullah Jakarta community ($N = 44,118$), which aggregates students, faculty, and administrative staff. The study employed purposive convenience sampling in gathering the responses from the target population. The questionnaire was distributed online via group chats to the active users of the e-Semesta platform. The method was chosen due to its cost-effectiveness, less time-consuming, and simple to operate [7].

Slovin's formula was used to determine the minimum necessary sample size to represent the population, this formula was also chosen due to its simplicity and usefulness when a population behaviour is still unknown [8]. A five percent margin of error was then applied to the equation.

$$\begin{aligned} n &= \frac{N}{1 + N \cdot E^2} \\ &= \frac{44118}{1 + 44118 \cdot 0.05^2} \\ &= \frac{8823600}{22259} \\ &\approx 397 \end{aligned} \quad (1)$$

Where:

n is the minimum amount of Sample

N is the Total Population

E is the determined Margin of Error

The results from this formula indicated that 397 was the minimum sample size necessary to obtain valid and representative results.

c. Research Variables and Instrument

This study analyzes the two main variables of the TAM model (PU and PEOU). Furthermore, there are two independent variables of the study, Perceived usefulness among users, and Perceived Ease of Use among users. The dependent variable to be measured is the satisfaction of the users of the e-Semesta application. Data was collected from the participants via a questionnaire. Primary TAM constructs questionnaires were adapted from similar study by Nabila and Waluyo (2026) and Praniffa et.al (2025) [9], [10].

Table 1. Questionnaire Indicators

Construct	Item
Perceived Usefulness	1. The e-Semesta application helps me obtain academic information more quickly. 2. The e-Semesta application makes it easier for me to complete academic/administrative matters. 3. Using e-Semesta makes my activities on campus more efficient. 4. The e-Semesta application is useful for supporting my academic needs. 5. The e-Semesta application helps me save time accessing campus services. 6. The features on e-Semesta meet my needs as a user. 7. The presence of e-Semesta increases my effectiveness in accessing campus services. 8. Overall, e-Semesta provides real benefits to me.
Perceived Ease of Use	1. The e-Semesta application is easy to learn from the first use. 2. The menus and features in e-Semesta are easy to understand. 3. Navigation within the e-Semesta application is easy. 4. I didn't experience many difficulties using e-Semesta. 5. The e-Semesta application's interface is simple and easy to understand. 6. I can use e-Semesta without needing much help from others. 7. Accessing the features in e-Semesta is easy for me. 8. Overall, e-Semesta is an easy-to-use application.
User's Satisfaction	1. I am satisfied using the e-Semesta application. 2. My experience using e-Semesta has been generally pleasant.

	3. The e-Semesta application has met my expectations as a user. 4. I feel that using e-Semesta was the right decision. 5. I am willing to continue using the e-Semesta application in the future. 6. I would recommend the e-Semesta application to other users on campus. 7. I find the services provided through e-Semesta quite satisfactory. 8. Overall, I am satisfied with the quality of the e-Semesta application.
Open Ended Questions	1. What are the main challenges you face when using the e-Semesta app? 2. What features or services do you think need improvement?

The questionnaire used a 1 to 5 Likert scale to measure each of the three main variables within the study, as well as include three open questions to allow the participants to describe any technical issues with the application and suggest features for the application. These instruments will be used to test the hypotheses illustrated below:

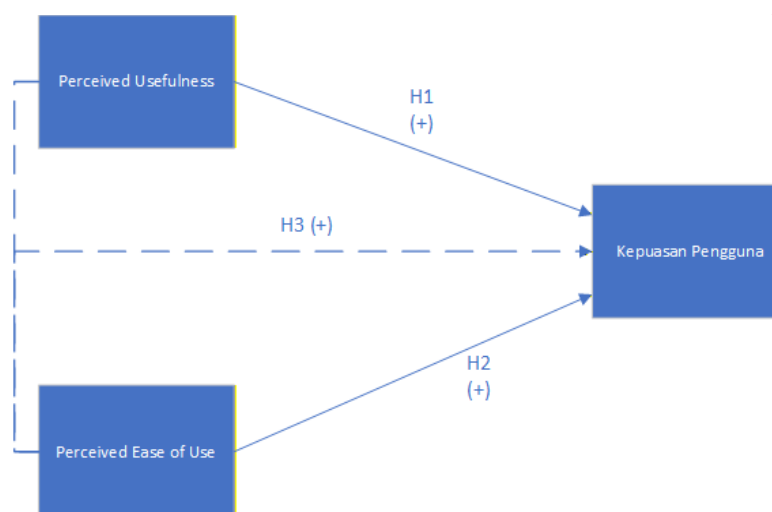


Figure 2 . Hypothesis Model

- H1: Perceived Usefulness (PU) Perceived Usefulness (PU) significantly enhances user satisfaction regarding the e-Semesta platform.
- H2: Perceived Ease of Use (PEOU) acts as a positive driver of e-Semesta application user satisfaction.
- H3: The joint interaction of PU and PEOU significantly determines overall user satisfaction with the e-Semesta application.

d. Data Analysis

The data were observed and analyzed using two processes for the quantitative and qualitative components. For the quantitative data, the metric data were analyzed using SPSS. Prior to performing the regression analysis, the instrument used for the research was first subjected to reliability and validity testing. For validity, the instrument was tested using the r value that signifies the Product Moment Correlation Coefficient. For an item to be considered valid, it must obtain r -value higher than the threshold r -value of 0.0984. For reliability, the instrument was tested using Cronbach's Alpha, any value higher than 0.60 suggests that the instrument was reliable [11]. Before the linear regression analysis was performed, tests for classical assumptions were conducted. These tests included tests for normality (using a Q-Q Plot), multicollinearity (testing Tolerance and VIF values), and heteroscedasticity (using the Glejser test, significance values higher than 0.05 indicated a passed test) [12]. For the quantitative data, User response trends were first contextualized using descriptive statistics. To measure predictive impact, simple and multiple linear regression analyses estimated the distinct independent effects of the variables alongside their combined explanatory power. Linear regression was selected for these analyses due to the simplicity, interpretability and familiarity of the statistical method [13]. Additionally, F-tests and t-tests were performed as they relate to the linear regression models.

The qualitative data were analyzed using Word Frequency Analysis in RapidMiner. Although methods like thematic analysis, sentiment analysis, and topic modeling are often utilized in the research of user behavior, TF-IDF and Word Frequency analysis were chosen as the techniques that would best correlate to the given dataset. Sentiment analysis was eliminated as a potential technique because the sentiment of the users regarding the product had already been measured through the survey instrument used to quantify user satisfaction with the product. Furthermore, the qualitative data exist in the form of short survey responses rather than interview transcripts, and the desired use of the qualitative data to identify specific technical bottlenecks in the product indicates that WFA is the most direct means of uncovering those obstacles.

Prior to analyzing the text for meaningful data, the text was preprocessed to improve the accuracy of the results. Preprocessing involves dividing the text into individual words (tokenization), converting the text to lowercase (Transform Cases), removing common words that did not contribute meaningfully to the text analysis (Filter Stopwords), and filtering individual words to those of at least four letters in length (Filter Tokens by Length). Following preprocessing, the TF-IDF method was measure each words importance. The method essentially rewards words with high occurrences in a specific document but also infrequent in the entire corpus [14]. Finally, the results were represented as a Word Cloud to visually represent the most common words that emerged from the users' complaints and suggestions.

3. Result and Discussion

a. Description of the Respondents

Following the data collection phase, a final sample of 397 active e-Semesta application users was established for empirical analysis.

Table 2. Demographic Breakdown of Participants

No	Status	Total	Percentage
1	Students	243	61.21%
2	Lecturers	97	24.43%
3	Staff	57	14.36%

The demographic breakdown based on user status consisted of mostly students, with 243 students, 97 lecturers, and 57 educational staff.

Table 3. Duration of Usage

No	Duration	Total	Percentage
1	<6 Months	44	11.08%
2	>2 Year	30	7.56%
3	1-2 Year	173	43.58%
4	6-12 Months	150	37.78%

In terms of usage duration, most of respondents had been using the application for 1 to 2 years (43.58%), followed by those using it for 6 to 12 months (37.78%).

b. Instrument Test

To verify that the empirical data were both stable and accurate, the questionnaire items were subjected to validity and reliability tests.

Table 4. Validity Test of PU, PE, and KP (User's Satisfaction) Components

Item	r	Description
PU1	0.903	Valid

PU2	0.899	Valid
PU3	0.89	Valid
PU4	0.897	Valid
PU5	0.91	Valid
PU6	0.89	Valid
PU7	0.913	Valid
PU8	0.901	Valid
PEOU1	0.88	Valid
PEOU2	0.904	Valid
PEOU3	0.895	Valid
PEOU4	0.839	Valid
PEOU5	0.895	Valid
PEOU6	0.855	Valid
PEOU7	0.919	Valid
PEOU8	0.912	Valid
KP1	0.918	Valid
KP2	0.916	Valid
KP3	0.922	Valid
KP4	0.922	Valid
KP5	0.888	Valid
KP6	0.9	Valid
KP7	0.9	Valid
KP8	0.925	Valid

The validity test, evaluated using Karl Pearson's correlation, showed that all statement items across the PU, PEOU, and KP (user satisfaction) variables measured an r-count greater than the r-table value of 0.0984. Consequently, all items were declared valid.

Table 5. Reliability Test of Components

Variable	Cronbach's Alpha	Description
PU	0.967	Reliable
PEOU	0.961	Reliable
KP	0.971	Reliable

The measurement instrument demonstrated acceptable internal reliability, as all studied variables yielded Cronbach's alpha coefficients well above the 0.70 benchmark.

c. Classical Assumption Test

Prior to analyzing the data using linear regression, classical assumption must be performed. The normality test was performed through an analysis of the spread of data within the Q-Q Plot.

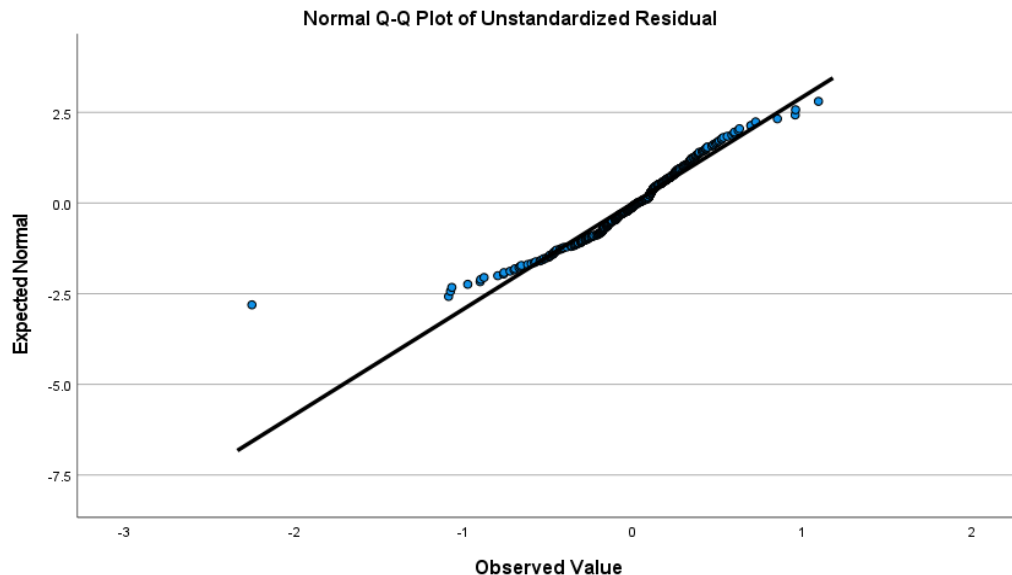


Figure 3. Q-Q Plot of the Data

Because the observed residuals cluster tightly around the diagonal axis, the regression model successfully fulfills the prerequisite of normally distributed.

Table 6. Multicollinearity Test on PU and PEOU Construct

Variable	Tolerance	VIF
PU	0.313	3.198
PEOU	0.313	3.198

The multicollinearity test results showed that both independent variables PU and PEOU had a Tolerance value of 0.313 (greater than 0.10) and a VIF of 3.198 (less than 10), indicating the absence of multicollinearity symptoms.

Table 7. Heteroscedasticity Test of PU and PEOU Construct

Variable	Sig.
PU	0.223
PEOU	0.298

Finally, the heteroscedasticity test on the independent variables using the Glejser method yielded significance values of 0.223 for PU and 0.298 for PEOU. Since both values exceeded 0.05, the regression model was declared free from heteroscedasticity.

d. Descriptive Analysis

To assess the satisfaction and the level at which a user categorizes the PU and PEOU of the application, descriptive analysis needs to be carried out on the survey data.

Table 8. Descriptive Analysis

Variable	Minimum	Max	Mean
Perceived Usefulness (PE)	1	5	3.4891
Perceived Ease of Use (PEOU)	1	5	3.4752
Satisfaction	1	5	3.3364

For calculating the mean (average) category in a survey with a Likert scale, the most common approach is to use the Class Interval Method. According to Alluhaybi et al., the use of a Likert scale with 5 points has the same interval of 0.8, which means the lowest category is in the range of 1.00-1.80 and the highest category in the interval 4.20-5 [15]. The lower limit of the second category and so on is often increased by 0.01 to avoid overlapping data. Therefore, the mean assessment category can use the following intervals:

- A value of 1,00 to 1,80 signify the Very Low category
- A value of 1,81 to 2,60 signify the Low category
- A value of 2,61 to 3,40 signify the Neutral category
- A value of 3,41 to 4,20 signify the High category
- A value of 4,21 to 5,00 signify the Very High category

A descriptive analysis of the variables revealed that the e-Semesta application received favorable ratings across both core dimensions, yielding mean scores of 3.49 for Perceived Usefulness (PU) and 3.48 for Perceived Ease of Use (PEOU). both falls into the "High" category. Meanwhile, the User Satisfaction variable recorded a mean score of 3.34, categorizing the overall satisfaction level as "Moderate".

e. Linear Regression Analysis

Separate simple linear regression models were first created to evaluate the isolated relationship between each independent construct (PU and PEOU) and the dependent variable (KP).

Table 9. Linear Regression Test for PU on KP

Variable	B	Sig
PU	0.934	<0.05

A simple linear regression analysis demonstrated that Perceived Usefulness significantly impacts User Satisfaction with a positive regression coefficient and a significance value of <0.05.

Table 10. Linear Regression Test for PEOU on KP

Variable	B	Sig
PEOU	0.910	<0.05

Similarly, Perceived Ease of Use showed a positive trend in regression coefficient with a sig. value of less than 0.05, indicating a positive effect on User Satisfaction.

The collective predictive capability of PU and PEOU was then assessed using multiple linear regression analysis to evaluate their combined variance.

Table 11. Multiple Linear Regression Test

Variable	B	Std error	Beta	t	Sig.
Constant	-0.127	0.065		-1.946	0.052
PU	0.597	0.031	0.585	19.242	<0.05
PEOU	0.410	0.031	0.398	13.107	<0.05

Based on the joint multiple linear regression model for PU and PEOU, the predictive relationship is expressed as follows:

$$\text{Satisfaction} = -0.127 + 0.597 \text{ PU} + 0.410 \text{ PEOU} \quad (2)$$

This indicates that every one-unit increase in PU or PEOU, assuming other variables remain constant, directly increases the level of user satisfaction.

f. Hypothesis Testing

Hypothesis testing aims to confirm the previously established theoretical assumptions of this study.

Table 12. F-Test Result

Model	F	Sig.
Regression	1535.491	<0.05

The results of the simultaneous test (F-test) indicated an F-count value of 1535.491 and a significance level of <0.05, which proves that PU and PEOU simultaneously and has a considerable impact on the dimension of User's Satisfaction, hence accepting H3.

Table 13. Partial Test Results

Variable	t	sig
PU	19.242	<0.05
PEOU	13.107	<0.05

is merely a mediator to usefulness, and does not have any direct impact upon satisfaction of the users of those websites [6]. In the case of the e-Semesta application, however, Perceived Ease of Use was proven to have a direct impact upon the satisfaction of the users of that application. Interestingly, a qualitative study by Agustyas et. Al was found to be contrasting with this research. Where in its case, it is discovered that the users were not familiar with the system and that they encountered various issues with the system's inputs [18]. In contrast, through conducting a mixed-methods analysis of the e-Semesta application, it became evident that the users were actually all familiar with the features of the application (as indicated by the high scores of "perceived ease of use"), but their satisfaction was impacted due to issues within the back-end systems of e-Semesta altogether. A further analysis into the wordcloud produced by word frequency analysis suggests that backend failures such as outages and login issues were especially prevalent. Chunlei et. Al in a quantitative study, concludes that one of the main factors influencing user's satisfaction are IT system quality [19], this implies that issues that prevent the user's needs to complete tasks in a timely manner could degrade user's trust in the system resulting in doubts about the system's reliability when handling administrative tasks. Studies like that of Wandira et al., Netinant et al., and Swe & Yang [4], [6], [20] all utilized pure quantitative Structural Equation Modeling (SEM) or in the case of Agustyas et al. purely uses qualitative approach. The use of mixed methods in this study indicates a different perspective on the topic of satisfaction.

It is also important to note the limitations regarding the high explanatory power ($R^2 = 0.886$) of the regression model. Because the data was collected cross-sectionally through the survey of users, common method bias is present in this study. A Harman's Single-Factor test was conducted to test for common method bias, and the results indicated that a single factor accounted for 73% of the variance in the data set, which is above the 50% threshold that is often used to determine the presence of common method bias. While this indicates that there is a high degree of overlap between the constructs that were measured in this study, such a high degree of overlap is theoretically appropriate for the observations being made within the context of the mandatory, task-based system of e-Semesta. Users will inherently value the system's utility and ease of use as a single concept rather than individually as separate constructs of satisfaction.

While previous literature on mandatory systems such as Rahmi et al. has demonstrated this theoretical construct overlap with a more moderate explanatory power [21], the exceptionally high R^2 observed in the e-Semesta application is logically consistent with our methodology and context. First, as noted, the cross-sectional nature of our survey introduced common method bias that essentially largen the R^2 values. Second, unlike the previous research, which covers a complex e-government tax platforms, The E-Semesta System mostly are being used by a uniform demographic (mostly university students) to facilitate low complexity tasks such as giving and monitoring grades. This usage pattern suggests that the variance is mainly concentrated to the functionality of the system. For example, Second, and more importantly, the primary transaction conducted by users on e-Semesta is highly utilitarian and binary: checking end-of-semester grades. Unlike complex software that users browse or explore, e-Semesta is utilized for single, high-stakes missions. If the server successfully delivers the grades, the system's utility and the user's satisfaction are simultaneously fulfilled. Conversely, if the server crashes during this critical period, as highlighted in our qualitative findings, both perceived usefulness and satisfaction drop simultaneously. This binary, mission-oriented usage naturally forces usefulness and satisfaction to behave as a single psychological construct, resulting in the high correlation and explanatory power observed in our model.

Finally, the high explanatory power of the model regarding the dependent variables must be examined in the context of the study's sampling methodology. Specifically, the use of purposive convenience sampling method inherently excludes the "statistical noise" of populations with little interest in the software. Furthermore, because these individuals voluntarily selected to participate in the survey (likely in response to the outages of the back-end servers supporting the software), their responses are inherently polarized between high scores for certain variables and low scores for others. Thus, the inherently polarized responses to the survey, combined with the common method bias of the survey, indicate the high explanatory power of the regression model. Therefore, future research would need to employ different methods of data collection to separate these variables.

4. Conclusion

The research successfully achieves its objectives of evaluating the satisfaction of users of the e-Semesta application, as well as determining the influence that each of the TAM constructs has upon the satisfaction of users within the application. The research indicates that the perceived ease of use of the e-Semesta application has a direct impact upon the satisfaction of its users, in contrast to some of the previous literature regarding user's satisfaction that suggested that ease of use of a system only indirectly impacts the satisfaction of its users. Furthermore, through analyzing the questionnaire that was distributed to users, means of ensuring optimal satisfaction for the users of e-Semesta were found to the specific areas of the system that may impact either the Perceived Usefulness or Perceived Ease-of-use of the application. Major obstacle to user's satisfaction regarding the application were found to be back-end instability, indicated by the difficulties the user has during logging in to the application. Therefore, recommendations for developers of the application were found to prioritize the improvement of the server infrastructure and back-end optimization of the application prior to any additional development of its features. Afterwards, the developers can begin to focus upon the development of features as requested by the users, such as attendance, while continuing to ensure the simplicity of the front-end of the application.

Future research should utilize more suitable sampling method and investigate additional latent variables within the model, such as the quality of the system and the quality of the data service, as these contribute to the variance in the likelihood of satisfaction with the e-Semesta application. Moreover, conducting interviews with the application's developers and end-users will allow for the investigation of the root of those technical issues, which will ensure the sustainability of the technological adoption of the application. Other quantitative approach such as PLS-SEM in combination to multi group analysis could also be done in order to better analyze each construct for students, lecturers, and staff.

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