The Technology Acceptance of Intelligent Silaturrahmi-based Collaboration Gamification Mechanic (ISb-GM) in Small Medium Enterprise

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Abstract **– This study evaluated the technology acceptance level of the proposed collaboration gamification framework based on the cultural principle "Silaturrahmi" and intelligent system (ISb-GM). This study uses the TAM (Technology Acceptance Model) to evaluate user acceptance of the ISb-GM framework by adding four attributes from the collaboration's parameter. 36 hypotheses are formulated with a sample of 293 respondents. Proving the hypothesis resulted in 29 hypotheses being accepted, while seven were rejected. These results suggest that the proposed framework is generally accepted. In comparison, the rejected hypothesis informs that technology needs to be applied more extended and continuously so that users can learn more about it and feel the benefits. This research has two implications.**

Firstly, SME developers can consider and implement this proposed framework in their communities to improve collaboration performance. Second, gamification technology developers can consider and improvise proposed gamification mechanics to develop collaboration mechanics for various fields.

Keywords **– collaboration gamification, intelligent system, Silaturrahmi culture, TAM.**

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1. Introduction

SMEs are one of the pillars of the economy of developing countries [1], [2], [3]. In its development, SMEs experience several obstacles, including weak collaboration performance kolaborasi [2], [4], [1]. [5]. Low motivation and lack of awareness of collaboration are one of the causes of weak collaboration [2], [4], [1], [5]. Then the solution can be to create innovations related to suitable approaches to increase collaboration [5].

Meanwhile, innovations in collaboration development can consider technological or interdisciplinary approaches to increase user interest in collaboration systems [6], [7], [8]. The "Silaturrahmi" culture, Intelligent Systems and gamification are proven to improve the collaboration performance of a community, one of which is the Small Medium System (SME). Previous research has produced an "Intelligent Silaturrahmi-based Collaboration Gamification (ISb-GM)", gamification framework that applies four parameters resulting from the assimilation of "Silaturrahmi" principles to measure collaboration performance.

The ISb-GM framework is represented in gamification technology based on web and mobile technologies, which are being tested on SME managers [9].

This test uses the TAM Model approach to evaluate user acceptance level of ISb-GM technology [10]. This evaluation involves five construct of TAM, including Perceived Usefulness (PoU), Perceived Ease of Use (PEoU), Attitude towards Using (AtU), Behavior Intention to Use (BItU) and Actual System to Use (AStU). Four new attributes are observed in the evaluation model, namely four collaboration parameters found in previous research: Relationship-Building, Reciprocal-Sustainment, Reciprocal-Assistant and Active-Support [11]. In this model, each attribute has nine hypotheses, so of the four attributes, this study involved 36 hypotheses. The process uses descriptive quantitative path analysis with Partial Least Square (PLS), calculated using the innovative PLS application.

This study's purpose is to evaluate how technology accepts the collaborative gamification applications that are being developed. This study will contribute as a representation of user attitudes towards proposed collaboration gamification. These findings can be used to provide recommendations to collaborative gamification system developers to use the hypothesized results to consider when revising or developing the system in the future.

2. Research Method

2.1. Hypothesis Development

Four new attributes observed are collaboration parameters validated in previous studies [11].

Relationship Building (RB) is a parameter that measures the strength of building relationships between individuals in collaboration [11]. Reciprocal Sustainment (RS) is a parameter that measures the strength of mutual support between partners in collaboration [11]. Reciprocal Assistant (RA) is a parameter that measures the magnitude of the activity of providing mutual assistance between collaborative partners [11]. Active Support (AS) is a parameter that measures the size of a player's initiative to offer and provide assistance actively. Then RB, RS, RA and AS are applied to the gamification mechanics and represented in the application being tested.

In this test, 5 TAM model constructs are applied to evaluate the level of technology acceptance, including "Perceived Usefulness" (PoU), "Perceived Ease of Use" (PEoU), "Attitude towards Using" (AtU), "Behavior Intention to Use" (BItU) and "Actual System to Use" (ASTU). PoU is the perception of user and belief that technology will benefit them [12], [13], [14]. PEoU is the user's perception or belief that computers can be easily understood and used [12], [13], [14]. AtU is the user's attitude towards the use of the system in the acceptance or rejection form as a result of using the technology in question [12], [13], [14]. BItU is the user's perception or belief to continue using the relevant technology [12], [13], [14]. AStU is the user's perception or belief that the technology in question is easy to use and will increase productivity as reflected in the actual conditions of its use [12], [13], [14].

Therefore, in this research method, the hypothesis is determined from the relationship of attributes with five constructs of the TAM model. Nine hypotheses determine each attribute. This evaluation model and all hypothesis statements are divided into four groups based on the following attributes presented in Figure 1 and the statements stated in this section:

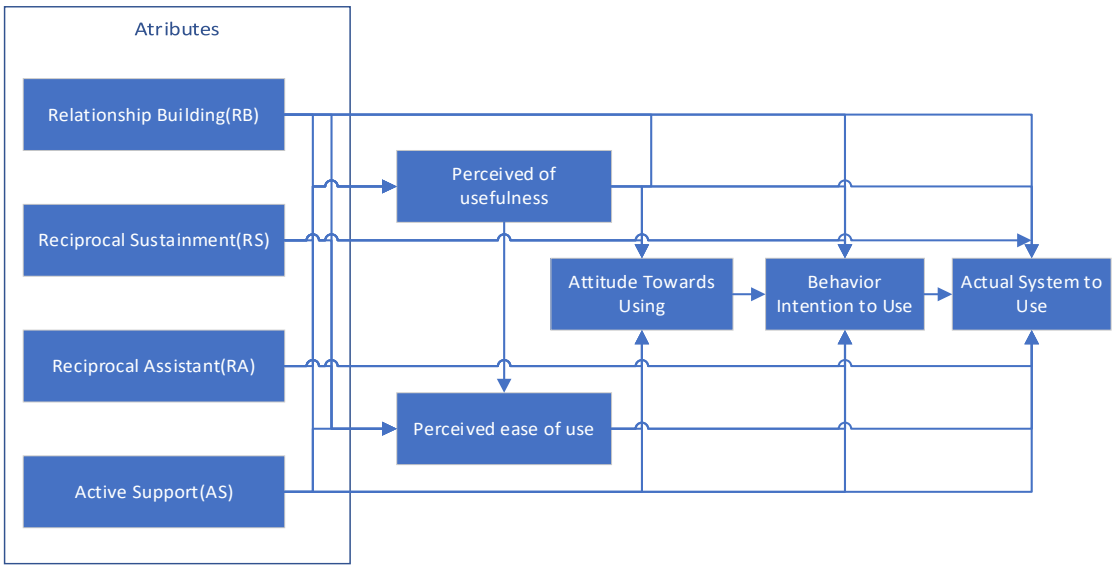

Figure 1. Evaluation Model

The attribute of Relationship Building (RB) TAM Evaluation:

H1 = "Perceived of Usefulness" (RB) has a significant influence on "Attitude towards Using";
H2 = "Perceived of Usefulness" (RB) has a significant influence on "Behaviour Intention" to Use;
H3 = "Perceived of Usefulness" (RB) has a significant influence on "Actual to Use";
H4 = "Perceived of Usefulness" (RB) has a significant influence on "Perceive Ease of Use" (RB);
H5 = "Perceived Ease" of Use (RB) has a significant influence on "Attitude towards Using";
H6 = "Perceived Ease of Use" (RB) has a significant influence on "Behaviour Intention to Use";
H7 = "Perceived Ease of Use" (RB) has a significant influence on "Actual to Use"
H8 = "Attitude towards Using" has a significant influence on "Behaviour Intention to Use";
H9 = "Behaviour Intention to Use" has a significant influence on "Actual to Use".

The attribute of Reciprocal Sustainment (RS) TAM Evaluation:

H1- "Perceived of Usefulness" (RS) has a significant influence on "Attitude Towards Using";
H2- "Perceived of Usefulness" (RS) has a significant influence on "Behaviour Intention to Use";
H3- "Perceived of Usefulness" (RS) has a significant effect on "Actual to Use";
H4- "Perceived Ease of Use" (RS) has a significant influence on "Attitude towards Using";
H5- "Perceived Ease of Use" (RS) has a significant influence on "Behavior Intention to Use";
H6- "Perceived Ease of Use" (RS) has a significant influence on "Actual to Use";
H7- "Attitude towards Using" has a significant influence on "Behaviour Intention to Use";
H8- "Behavior Intention to Use" has a significant influence on "Actual to Use";
H9- "Perceived of Usefulness" (RS) has a significant influence on "Perceived Ease of Use" (RS).

The attribute of Reciprocal Assistant (RA) TAM Evaluation:

H1- "Perceived of Usefulness" (RA) has a significant influence on "Attitude towards Using";
H2- "Perceived of Usefulness" (RA) has a significant influence on "behaviour Intention to Use";
H3- "Perceived of Usefulness" (RA) has a significant influence on "Actual to Use";
H4- "Perceived Ease of Use" (RA) has a significant influence on "Attitude towards Using";
H5- "Perceived Ease of Use" (RA) has a significant influence on "Behaviour Intention to Use";
H6- "Perceived Ease of Use" (RA) has a significant influence on "Actual to Use";
H7- "Attitude towards Using" has a significant influence on "Behaviour Intention to Use";
H8- "Behavior Intention to Use" has a significant influence on "Actual to Use";
H9- "Perceived of Usefulness" (RA) has a significant influence on "Perceived Ease of Use" (RA).

The Attributes of Active Support (AS) TAM Evaluation:

H1- "Perceived of Usefulness" (AS) has a significant influence on "Attitude towards Using";
H2- "Perceived of Usefulness" (AS) has a significant influence on "Behaviour Intention to Use";
H3- "Perceived of Usefulness" (AS) has a significant influence on "Actual Using";
H4- "Perceived Ease of Use" (AS) has a significant influence on "Attitude towards Using";
H5- "Perceived Ease of Use" (AS) has a significant influence on "Behaviour Intention to Use";
H6- "Perceived Ease of Use" (AS) has a significant influence on "Actual Using"
H7- "Attitude towards Using" has a significant influence on "Behaviour Intention to Use";
H8- "Behavior Intention to Use" has a significant influence on "Actual Using";
H9- "Perceived of Usefulness" (AS) has a significant influence on "Perceived Ease of Use" (AS).

2.2. Sample and Procedure

This study collected data from SME managers in several regions in East Java Province. The determination of this region is based on data on the number of SMEs in East Java, which is classified as dominant compared to other provinces in Indonesia [16]. Data collection is carried out online or in person (onsite). Questionnaire items refer to the TAM model approach [12], [13], [14]. Data was collected by distributing questionnaires totaling 66 questions that SME-related instrument experts had previously validated. The total population is 1100 SME managers, while the determination of the sample is based on the Slovin approach [17]:

$$n = \frac{N}{(1+(N*0.5^2))},$$

where:
n= sample,
N= population,
so that the number of samples obtained was 293 respondents.

2.3. Measurement

The questionnaire preparation is based on four attributes (RB, RS, RA, AS) associated with the two TAM constructs involved (PoU, PEoU), each structured into seven questions. The questions for the PoU are emphasized extracting information on user's trust in the involvement of the four attributes (RB, RS, RA, AS) in the proposed technology that can improve performance [13], [14]. Whereas the questions for the PEoU focused on extracting information about user' confidence in the proposed technology involving four attributes (RB, RS, RA, AS) that are easy to use [13], [14]. The relationship between BItU, AtU, and AStU is structured in eleven questions. Questions for BItU focused on extracting information on user's beliefs and intentions to use the proposed technology [14], [15]. Then, the question items for AtU explore information on positive or negative attitudes toward the proposed technology [14], [15]. Meanwhile, the AStU question items emphasized extracting information on user's intensity in using the proposed technology [14], [15]. The total of all questions is 36 items. The questionnaire answer design uses a Likert scale of 1-7 with the following selected items: value 1 = "Strongly recommended", 2 = "Not recommended", 3 = "Not recommended somewhat" 4 = "Recommended", 5 = "Neutral", 6= "Recommended somewhat" and 7= "Strongly recommended".

2.4. Analysis Method

This experiment uses the "Structural Equation Modelling" (SEM) approach, where this method is based on "Partial Least Square" (PLS). This method applies two stages of measurement, namely the measurement model and structure model [10], [16]. The measurement model activity calculates the outer model's value, which consists of Discriminant Validity, Internal Consistency Reliability, and Convergent Validity [10], [16]. Discriminant Validity is observed from the state of a construct significantly different from other constructs based on applicable empirical standards [16]. Then, Convergent Validity is observed from the validity value of the latent or constructed variable relationship to the indicator. The guideline is that the loading factor value is more significant than 0.7, stating that the indicator is considered an appropriate measuring instrument and vice versa [10], [16].

Meanwhile, Internal Consistency Reliability/ Composite reliability is the intercorrelation of the observed variable indicators and then measures the estimation of their reliability [10], [16].

3. Result and Discussion

3.1. Convergent Validity

The PLS calculation process begins with calculating Convergent validity which aims to see the close relationship between the indicators involved and the construct. Calculation of Convergent Validity can be tested in 2 ways: (1) calculating the "outer loading" value has to be at least 0.5 or 0.7 as a requirement for acceptance of the indicator as an appropriate measuring tool; (2) the result of the minimum AVE value is more significant than 0.5 [10]. The experiment shows that the outer loading value for each indicator is above 0.5 and 0.7, which means that all indicators and constructs have a close relationship with each other (referring to Table 1). It can be stated that all indicators meet the requirements to be declared as appropriate measuring instruments for their construct variables. Refer "I" is the number of indicators, and "C" is the number of constructs.

Table 1. Convergent Validity (RB, RS, RA, AS)

Attribute	I	Outer Loading	C	AVE
RB	25	>0.5=1, >0.7=24	5	C >0.5=5
RS	25	>0.5=1, >0.7=24	5	C >0.5=5
RA	25	>0.5=1, >0.7=24	5	C >0.5=5
AS	25	>0.5=1, >0.7=24	5	C >0.5=5

3.2. Discriminant Validity

In contrast to Convergent Validity, discriminant validity tests and compares the relationship between indicators and their constructs with other constructs. The ideal size of an indicator is if the relationship with the construct itself is closer than with the other constructs. The validity of Discriminant Validity is determined in two ways: (1) if the Fornell Larcker Criterion value or square root of the AVE value is greater than (>) the correlation coefficient between variables/relationship between constructs, (2) if the cross-loadings value is greater than (>) the other indicators [10].

In this study, the Fornell Larker Criterion value on the diagonal axis is greater than the value of the variable below it. Accordingly, the value of each indicator in the construct (Cross loadings) is greater than the other indicators.

It can be interpreted as a valid indicator for measuring the constructed variable by proving that the indicator has a close relationship with the construct compared to other construct indicators. The test is continued by calculating Cronbach's Alpha value which aims to measure the instrument's consistency (reliability), refer to Table 2. The calculation results in a composite reliability and Cronbach's Alpha value of all constructs, which is more significant than 0.7. It means the instrument is consistent and reliable to meet the requirements for use in the planned TAM model evaluation.

Table 2. Discriminant Validity (RB, RS, RA, AS)

Attribute	RB		RS		RA		AS	
	Cronbach's -Alpha	Composite-Reliability	Cronbach'-Alpha	Composite-Reliability	Cronbach's -Alpha	Composite-Reliability	Cronbach's -Alpha	Composite-Reliability
Actual to Use	0.831	0.899	0.831	0.899	0.831	0.899	0.831	0.899
Attitude Towards Using	0.873	0.913	0.873	0.913	0.873	0.913	0.873	0.913
Behaviour Intention to Use	0.874	0.914	0.874	0.914	0.874	0.914	0.874	0.914
Perceive Ease of Use	0.927	0.941	0.922	0.937	0.920	0.936	0.932	0.945
Perceive of Usefulness	0.889	0.914	0.875	0.903	0.876	0.904	0.876	0.904

3.3. Model Structure

The structural model was carried out to examine the causality relationship between latent variables by calculating the R-Square and comparing it with the Adjusted R-Square [10]. .

Tests were carried out for the four variables (RB, RS, RA, AS). The test results are presented in Table 3, which reports the R-Square and R-Square Adjusted values of the four variables involved in the TAM model.

Table 3. R-Square Values (RB, RS, RA, AS)

Attribute	RB		RS		RA		AS	
	R-Square	R-Square-Adjusted	R-Square	R-Square-Adjusted	R-Square	R-Square-Adjusted	R-Square	R-Square-Adjusted
Actual to Use	0.760	0.757	0.746	0.743	0.740	0.737	0.752	0.750
Attitude Towards Using	0.669	0.666	0.626	0.623	0.671	0.669	0.706	0.704
Behaviour Intention to Use	0.718	0.715	0.699	0.696	0.707	0.704	0.702	0.699
Perceive Ease of Use	0.590	0.589	0.676	0.675	0.614	0.613	0.588	0.587

Table 3 shows that the adjusted R-Square value of the RB, RS, RA and AS attributes in the "Actual to use" variable is 0.7 and above. It indicates that the variable "Actual to use" can be influenced by the 3 variables "Perceived Usefulness", "Perceived Ease of Use," and "Behavior Intention to Use," which is above 70%, while other variables outside those researched influence 30%. Then, the adjusted R-Square value of the RB, RS, RA and AS attributes in the "Attitude toward using" variable is 0.6 and above. It indicates that the variable "Attitude toward Using" can be influenced by 2 variables, "Perceived Usefulness" and "Perceived Ease of Use," with the four attributes tested being above 60%. In contrast, 40% is influenced by other variables outside those studied.

Meanwhile, the adjusted R-Square value of the RB, RS, RA and AS attributes in the "Behavior Intention to Use" variable is above 0.6. It indicates that the variable "Behavior Intention to Use" can be influenced by the 3 "Perceived Usefulness" variables, "Perceived Ease of Use," and "Attitude toward using" is above 60%. In contrast, 31.4% is influenced by other variables outside those studied.

Meanwhile, the adjusted R-Square value of the RB, RS, RA and AS attributes on variables is above 0.55. It indicates that the "Perceived Ease of Use" variable can be influenced by the "Perceived Usefulness" variable with 4 attributes RB, RS, RA, and AS. In contrast, 45% is influenced by other variables not examined. A path model structure for each attribute complements the model structure. Figure 2, Figure 3, Figure 4 and Figure 5 present a visualization of the path model structure of the RB, RS, RA and AS attributes.

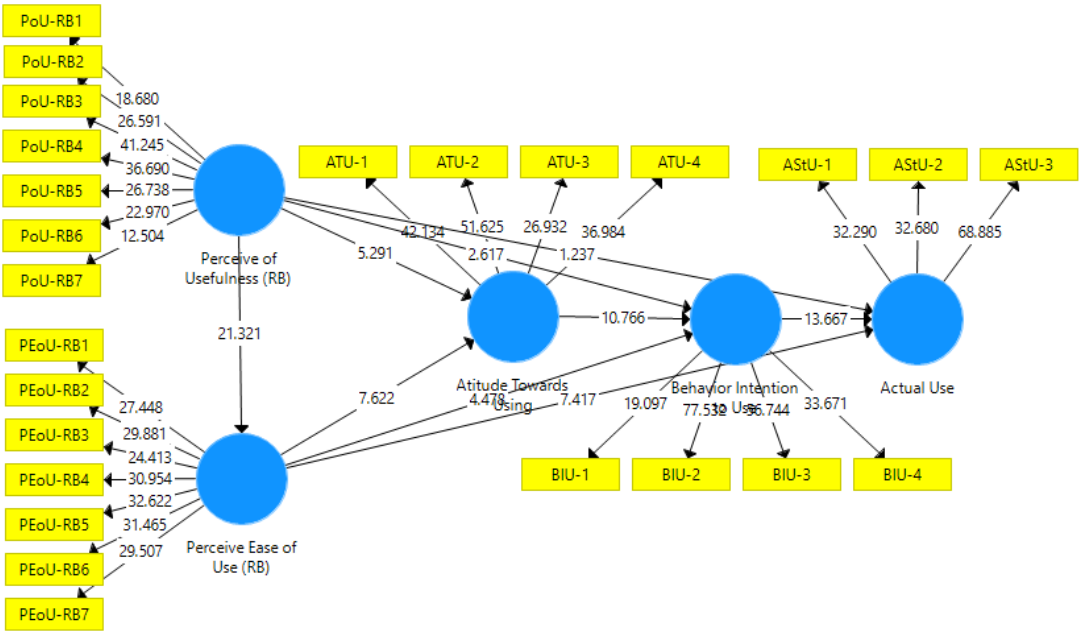

Figure 2 . Path Model Structure-Relationship Building

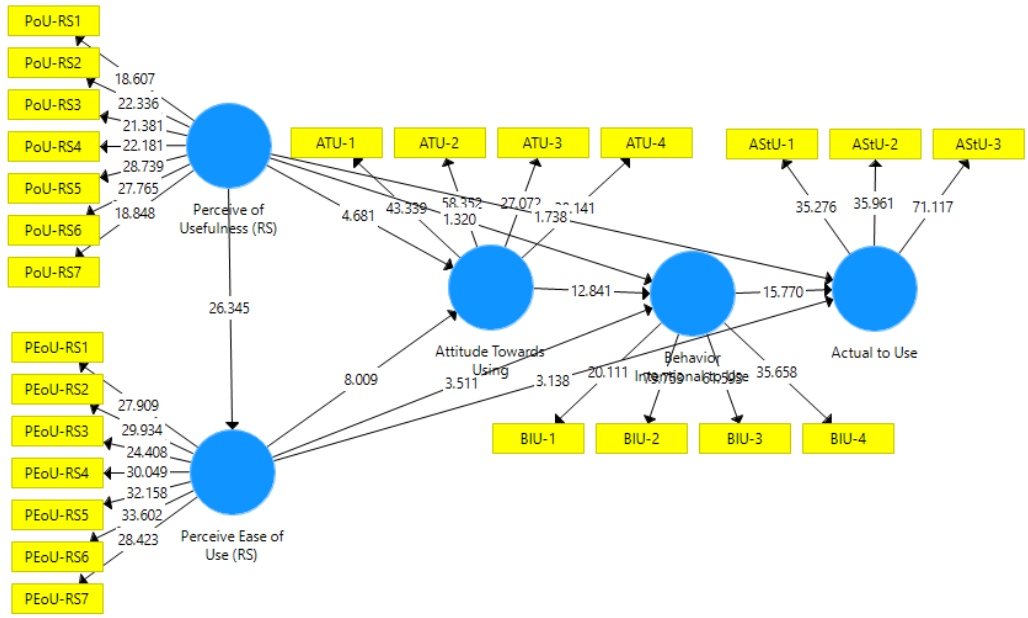

Figure 3. Path Model Structure-Reciprocal Sustainment

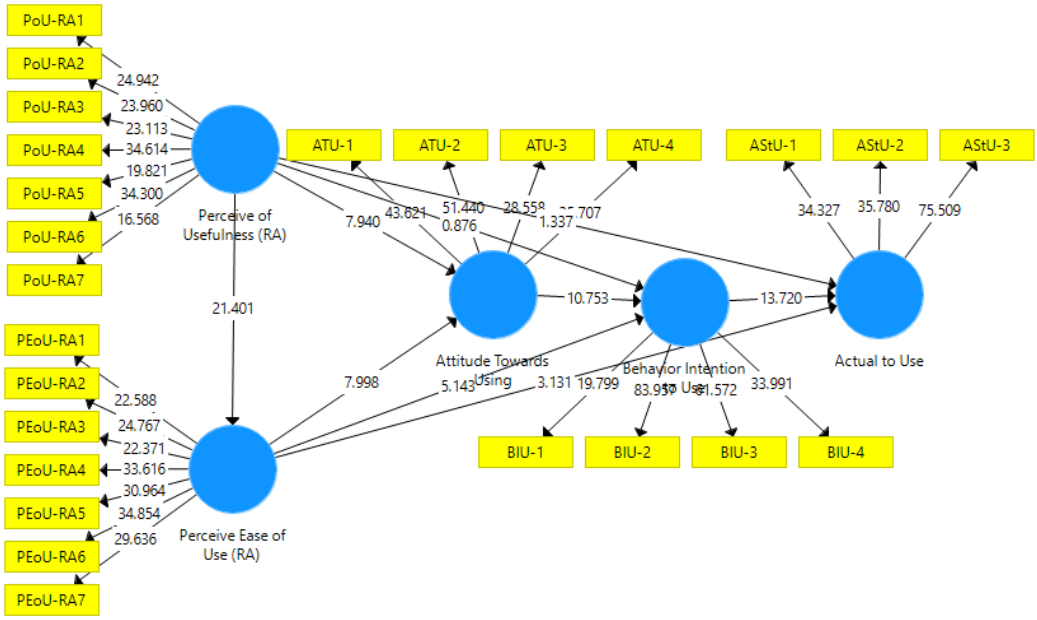

Figure 4. Path Model Structure-Reciprocal Assistant

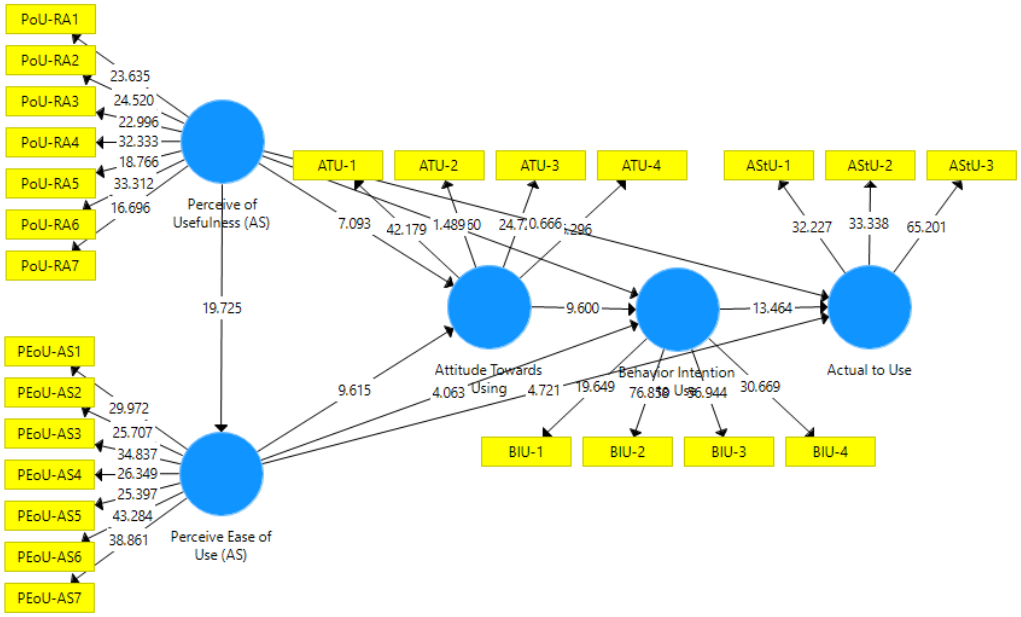

Figure 5. Path Model Structure-Active Support

3.4. Hypotheses Result

The next step is to test the hypothesis by describing the results of the T-Statistics and P-Value. T-statistics shows the relationship between indicators and their variables, where the greater the T-statistics, the more dominant the indicator is in measuring the variable. By looking at the T-statistics value, it has to be more than the critical value (alpha 0.05) or T table = 1.96 or seeing that the P value has to be <0.05, so it is said that those measured in the hypothesis have a relationship [11]. Table 4, Table 5, Table 6 and Table 7 show the results of testing all hypotheses grouped based on four attributes (RB, RS, RA, AS). Table 4 describes the results of all hypotheses in the TAM evaluation for the Relationship Building (RB) parameter. The RB group hypothesis resulted in eight accepted hypotheses, and one rejected hypothesis. Table 5 describes the results of all hypotheses in the TAM evaluation for the Reciprocal Sustainment RS parameter). The hypothesis of the RS hypothesis group produces seven accepted hypotheses and two rejected hypotheses. Table 6 describes the results of all hypotheses in the TAM evaluation for the Reciprocal Assistant (RA) parameter. The RA hypothesis group produces seven accepted hypotheses and two rejected hypotheses. Table 7 describes the results of all hypotheses in the TAM evaluation for the Active Support (AS) parameter. The US hypothesis group produces seven accepted hypotheses and two rejected hypotheses.

Table 4. Hypotheses Result for Relationship Building

	Original-Sample (O)	Sample-Mean (M)	Standard-Deviation	T Statistics-(|O/STDEV|)	P Values	Result
H1- Perceive of Usefulness (RB) -> Attitude Towards Using	0.343	0.343	0.065	5.291	0.000	Accepted
H2- Perceive of Usefulness (RB) -> Behavior Intention to Use	0.139	0.145	0.053	2.617	0.009	Accepted
H3- Perceive of Usefulness (RB) -> Actual to Use	-0.060	-0.061	0.048	1.237	0.217	Rejected
H4- Perceive of Usefulness (RB) -> Perceive Ease of Use (RB)	0.768	0.766	0.036	21.321	0.000	Accepted
H5- Perceive Ease of Use (RB) -> Attitude Towards Using	0.525	0.522	0.069	7.622	0.000	Accepted
H6- Perceive Ease of Use (RB) -> Behavior Intention to Use	0.251	0.247	0.056	4.478	0.000	Accepted
H7- Perceive Ease of Use (RB) -> Actual to Use	0.341	0.343	0.046	7.417	0.000	Accepted
H8- Attitude Towards Using -> Behavior Intention to Use	0.519	0.514	0.048	10.766	0.000	Accepted
H9- Behavior Intention to Use -> Actual to Use	0.629	0.626	0.046	13.667	0.000	Accepted

Table 5. Hypotheses Result for Reciprocal Sustainment

	Original Sample-(O)	Sample Mean-(M)	Standard-Deviation	T Statistics-(|O/STDEV|)	P Values	Result
H1- Perceive of Usefulness (RS) -> Attitude Towards Using	0.310	0.313	0.066	4.681	0.000	Accepted
H2- Perceive of Usefulness (RS) -> Behavior Intention to Use	0.073	0.071	0.055	1.320	0.188	Rejected
H3- Perceive of Usefulness (RS) -> Actual to Use	0.097	0.100	0.056	1.738	0.083	Rejected
H4- Perceive Ease of Use (RS) -> Attitude Towards Using	0.516	0.514	0.064	8.009	0.000	Accepted
H5- Perceive Ease of Use (RS) -> Behavior Intention to Use	0.201	0.202	0.057	3.511	0.000	Accepted
H6- Perceive Ease of Use (RS) -> Actual to Use	0.161	0.156	0.051	3.138	0.002	Accepted
H7- Attitude Towards Using -> Behavior Intention to Use	0.612	0.611	0.048	12.841	0.000	Accepted
H8- Behavior Intention to Use -> Actual to Use	0.663	0.664	0.042	15.770	0.000	Accepted
H9- Perceive of Usefulness (RS) -> Perceive Ease of Use (RS)	0.822	0.821	0.031	26.345	0.000	Accepted

Table 6. Hypotheses Result for Reciprocal Assistant

	Original-Sample (O)	Sample-Mean (M)	Standard-Deviation	T Statistics-(|O/STDEV|)	P Values	Result
H1- Perceive of Usefulness (RA) -> Attitude Towards Using	0.432	0.434	0.054	7.940	0.000	Accepted
H2- Perceive of Usefulness (RA) -> Behavior Intention to Use	0.056	0.054	0.064	0.876	0.381	Rejected
H3- Perceive of Usefulness (RA) -> Actual to Use	0.070	0.071	0.052	1.337	0.182	Rejected
H4- Perceive Ease of Use (RA) -> Attitude Towards Using	0.436	0.432	0.054	7.998	0.000	Accepted
H5- Perceive Ease of Use (RA) -> Behavior Intention to Use	0.263	0.264	0.051	5.143	0.000	Accepted
H6- Perceive Ease of Use (RA) -> Actual to Use	0.166	0.166	0.053	3.131	0.002	Accepted
H7- Attitude Towards Using -> Behavior Intention to Use	0.573	0.573	0.053	10.753	0.000	Accepted
H8- Behavior Intention to Use -> Actual to Use	0.674	0.672	0.049	13.720	0.000	Accepted
H9- Perceive of Usefulness (RA) -> Perceive Ease of Use (RA)	0.784	0.780	0.037	21.401	0.000	Accepted

Table 7. Hypotheses Result for Active Support

	Original-Sample (O)	Sample-Mean (M)	Standard-Deviation	T Statistics-(|O/STDEV|)	P Values	Result
H1- Perceive of Usefulness (AS) -> Attitude Towards Using	0.381	0.382	0.054	7.093	0.000	Accepted
H2-Perceive of Usefulness (AS) -> Behavior Intention to Use	0.092	0.091	0.062	1.489	0.137	Rejected
H3-Perceive of Usefulness (AS) -> Actual Using	0.034	0.037	0.051	0.666	0.506	Rejected
H4-Perceive Ease of Use (AS) -> Attitude Towards Using	0.511	0.509	0.053	9.615	0.000	Accepted
H5-Perceive Ease of Use (AS) -> Behavior Intention to Use	0.234	0.237	0.058	4.063	0.000	Accepted
H6-Perceive Ease of Use (AS) -> Actual Using	0.257	0.257	0.054	4.721	0.000	Accepted
H7-Attitude Towards Using -> Behavior Intention to Use	0.561	0.557	0.058	9.600	0.000	Accepted
H8-Behavior Intention to Use -> Actual Using	0.630	0.626	0.047	13.464	0.000	Accepted
H9-Perceive of Usefulness (AS) -> Perceive Ease of Use (AS)	0.767	0.762	0.039	19.725	0.000	Accepted

4. Result and Discussion

Testing the RB attribute hypothesis in the TAM model resulted in the majority being accepted. The eight accepted hypotheses may indicate that the application of the relationship building (RB) parameter in the proposed collaborative gamification from the point of view of acceptance of the use of technology, users have positive attitudes, including (1) curiosity about using technology, (2) users have interest in continuing to use, (2) users believe that technology is easy to use [16], [17]. Meanwhile, from the point of view of acceptance of the convenience of technology, users have positive attitudes, including (1) curiosity about technology, (2) behavioral attitudes of wanting to continue using it and (3) happy attitudes toward using the technology [16], [17]. The attitude of curiosity towards technology also positively affects wanting to continue using technology, influencing the belief that technology brings benefits.

H3 is rejected, indicating that although perceptions and attitudes towards technology tend to be positive, users still think that the technology is challenging to use. This condition can be developed in future research to investigate the causal factors and how to anticipate them more deeply.

Hypothesis testing from "Reciprocal Sustainment" (RS), "Reciprocal Assistant" (RA), and "Active Support" (AS) yielded similar conclusions. Three tests each produce seven hypotheses that are accepted and two that are rejected. Seven accepted hypotheses can be concluded that the application of the parameters RS, RA and AS in the proposed collaborative gamification from the point of view of acceptance of the use of technology, users have positive attitudes, including (1) curiosity about using technology, (2) users believe that technology is easy to use. Meanwhile, from the point of view of acceptance of the convenience of technology, users have positive attitudes, including (1) curiosity about technology, (2) behavioral attitudes that they want to continue using and (3) happy attitudes toward using the technology. The attitude of curiosity towards technology also positively affects wanting to continue using technology, influencing the belief that technology brings benefits.

H2 is rejected, indicating the user's behavior does not meet the parameter "behavior intention to use",which can be interpreted that although perceptions and attitudes towards the existence of the RS, RA and AS parameters in gamification technology tend to be positive, the user is still not interested in continuing to use it [16], [17]. In line with H3, which was rejected, it may indicate that although perceptions and attitudes towards the existence of parameters RS, RA and AS in gamification technology tend to be positive, the user's attitude does not meet the criteria for achieving "Actual to use" [16], [19], where users still consider that technology is not easy to [16], [17]. In other words, H2 and H3 are correlated. That is, the application of the parameters RS, RA and AS in collaborative gamification technology from a usability perspective still needs to be considered easier to operate, thereby reducing user interest in continuing to use it [16], [17]. This condition can be developed in future research to investigate the causal factors and how to anticipate them more deeply.

The "TAM" evaluation resulted in an acceptance analysis of collaborative gamification technology, representing the proposed framework (ISb-GM). The results of this evaluation prove that the user's attitude is sufficient to accept the proposed framework with 29 proven hypotheses accepted, a total of 36 hypotheses. Therefore, the proposed framework is valid as a collaboration framework that SMEs can apply. These results are new findings in collaboration frameworks, where the idea of the framework and the problem's urgency have been discussed in previous research [18], [19]. The proposed new framework is also equipped with collaboration and knowledge extraction parameters in providing references to user collaboration partners that have yet to be completed in previous studies [5], [20]. This proposed framework is also one of the contributions to the development of collaboration-based gamification mechanics, which has the novelty of assimilating local wisdom "Silaturrahmi", which is applied in gamification mechanics which has not been done in previous studies [21]. Therefore, this research can serve as a reference for interested parties to implement and develop a framework for collaboration and the development of gamification mechanics.

5. Conclusion

The results of the TAM test resulted in various decisions, where most of the technologies connected with the 4 parameters were accepted, although some were rejected. 29 of the 36 hypotheses were accepted, while 7 were rejected. From these results, the proposed framework can be accepted in terms of technology acceptance. In the hypothesis, however, that is rejected because the user only interacts with the prototype for a short time, so the benefits and convenience of technology are not felt, since collaboration has to involve partners. Future research can design research that emphasizes user's interaction with longer collaboration gamification mechanics so that research obtains sufficient data for evaluation.

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