Validity is defined as the extent to which a construct is distinct from other constructs in an established empirical standard [35].

III. Result and Discussion

A. Convergent Validity.

Convergent validity is used to test the close relationship between the indicator and its construct. The results of the Convergent Validity test are seen in 2 ways. First, based on the value (outer loading), with the condition that an indicator is said to be the right measuring tool if the outer loading value is > 0.7. Second, based on the AVE value with the prerequisite, the AVE value must be greater than 0.5 [35]. Table I shows the outer loading value of the 21 indicators in this evaluation, and there are 20 indicators greater than 0.7 and 1 indicator (X6.1) with the opposite value. It means that a total of 20 indicators have a close relationship with the construct, so it can be said that the indicator is valid as a measuring tool for the constructed variable. This test is also strengthened by the Average Variance Extracted (AVE) value of each construct having a value > 0.5 (Table I).

TABLE I
OUTER LOADING VALUE

Indicators	Avoidance	Development	Collaboration Gamification	Ownership	Purpose	Social Influence	Unpredictable
X1.1					0.835		
X1.2					0.857		
X1.3					0.873		
X2.1		0.885					
X2.2		0.905					
X2.3		0.878					
X3.1				0.879			
X3.2				0.935			
X3.3				0.875			
X4.1						0.847	
X4.2						0.908	
X4.3						0.853	
X5.1							0.873
X5.2							0.871
X5.3							0.882
X6.2	0.910						
X6.3	0.902						
Y1			0.866				
Y2			0.875				
Y3			0.839				

TABLE II
AVE VALUE

Construct	Average Variance Extracted (AVE)
Avoidance	0.822
Collaboration Gamification	0.791
Development	0.740
Ownership	0.804
Purpose	0.731
Social Influence	0.757
Unpredictable	0.766

B. Discriminant Validity.

Discriminant validity is used to test the closeness of the relationship between indicators and their constructs compared to indicators in other constructs. A good indicator is if it has a closer relationship with its construct than with other constructs. The results of the Discriminant Validity test are viewed in 2 ways. First, based on the Fornell Larcker Criterion value (square root of the AVE value), with the condition that an indicator is said to be an appropriate measuring tool if the Fornell Larcker Criterion value is greater than the relationship between constructs/correlation coefficient between variables. Second, based on the value of cross-loadings, with the condition that the indicator must have a cross-loadings value that is greater than the other indicators [35].

TABLE III
FORNEL LARCKER CRITERION VALUE

Construct	Avoidance	Collaboration	Development	Ownership	Purpose	Social	Unpredictable
Avoidance	0.906						
Collaboration	0.662	0.889					
Development	0.599	0.648	0.860				
Ownership	0.674	0.762	0.658	0.897			
Purpose	0.637	0.691	0.693	0.754	0.855		
Social	0.605	0.649	0.691	0.703	0.706	0.870	
Unpredictable	0.653	0.713	0.628	0.736	0.712	0.719	0.875

TABLE IV
CROSS LOADING VALUE

Construct	Avoidance	Collaboration	Collaboration Gamification	Ownership	Purpose	Social Influence	Unpredictable
X1.1	0.537	0.577	0.596	0.611	0.835	0.574	0.624
X1.2	0.525	0.601	0.547	0.637	0.857	0.602	0.639
X1.3	0.569	0.595	0.630	0.684	0.873	0.633	0.567
X2.1	0.576	0.885	0.582	0.627	0.640	0.583	0.613
X2.2	0.605	0.905	0.544	0.671	0.582	0.535	0.615
X2.3	0.586	0.878	0.599	0.732	0.618	0.610	0.670
X3.1	0.603	0.729	0.573	0.879	0.649	0.574	0.673
X3.2	0.617	0.662	0.597	0.935	0.687	0.643	0.682
X3.3	0.593	0.660	0.599	0.875	0.691	0.672	0.625
X4.1	0.535	0.542	0.604	0.624	0.584	0.847	0.598
X4.2	0.542	0.555	0.629	0.587	0.626	0.908	0.623
X4.3	0.501	0.602	0.569	0.627	0.634	0.853	0.657
X5.1	0.559	0.599	0.576	0.644	0.625	0.702	0.873
X5.2	0.536	0.606	0.504	0.625	0.588	0.564	0.871
X5.3	0.616	0.667	0.564	0.662	0.653	0.613	0.882
X6.2	0.910	0.610	0.554	0.651	0.602	0.588	0.611
X6.3	0.902	0.590	0.532	0.569	0.552	0.508	0.572
Y1	0.577	0.554	0.866	0.579	0.600	0.608	0.511
Y2	0.517	0.541	0.875	0.580	0.604	0.583	0.523
Y3	0.449	0.578	0.839	0.539	0.583	0.592	0.588

Table III shows that the Fornell Larker Criterion value found on the diagonal axis in Table III is greater than the variable's value below it. It means that all indicators have a close relationship with the construct compared to other constructs, so it can be said that the indicator is valid as a measuring tool for the constructed variable. Additionally, this test is bolstered by the Cross loadings value (Table IV), which indicates that each indication in the construct has a more significant value than the others.

TABLE V
CRONBACH ALPHA AND COMPOSITE RELIABILITY

	Cronbach's Alpha	Composite Reliability
Avoidance	0.783	0.902
Collaboration Gamification	0.868	0.919
Development	0.824	0.895
Ownership	0.878	0.925
Purpose	0.816	0.891
Social Influence	0.839	0.903
Unpredictable	0.848	0.908

Cronbach's Alpha is used to determine the instrument's reliability/consistency. Cronbach's alpha > 0.7 and composite reliability > 0.7 indicate that an instrument is dependable. Cronbach's Alpha and the consequent composite reliability are described in Table V. Of all constructs, a value of > 0.7 means that the instrument used in evaluating gamification characteristics is consistent and reliable.

C. Inner Model.

Structural Model Testing (Inner Model) is used to forecast causal linkages (cause-and-effect relationships) between latent variables or variables that are not readily quantifiable. The R-square for the dependent construct t-test and the significance of the coefficients of the structural route parameters were used to evaluate this model. The evaluation procedure begins with examining the R-square for each latent dependent variable. The test findings indicate that the Collaboration gamification variable has an R-Square Adjusted value of 0.584. These results indicate that 58.4% of the Collaboration gamification variables can be influenced by the six latent variables studied, while others outside the study influence 31.6%. Fig. 2 describes the Path-model structure gamification characteristics that have been carried out by the inner model process in smart PLS.

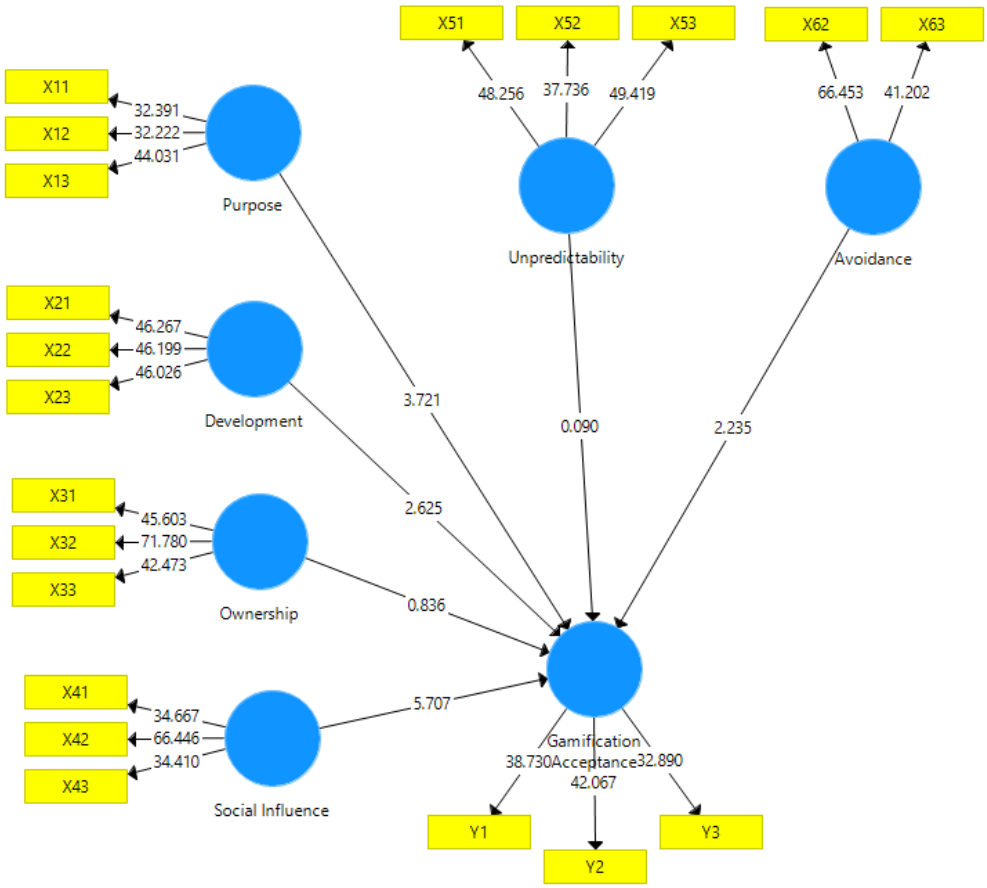

Fig. 2 Path Model of Gamification Motivation Analysis.

Meanwhile, Table VI has described the results of T-Statistics and P-Value used to test the hypothesis. T-statistics shows the relationship between indicators and their variables, where the larger the T-statistics, the more dominant the indicator in measuring the variable. By looking at the T-statistics value that must be more than the critical value (alpha 0.05) or T table = 1.96 or seeing the P value must be < 0.05, it is said that those measured in the hypothesis have a significant relationship.

TABLE VI
T-STATISTIC AND P-VALUE

Relationship	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Purpose -> Collaboration Gamification	0.259	0.259	0.070	3.721	0.000
Development -> Collaboration Gamification	0.157	0.159	0.060	2.625	0.009
Ownership -> Collaboration Gamification	0.058	0.055	0.069	0.836	0.403
Social Influence -> Collaboration Gamification	0.297	0.295	0.052	5.707	0.000
Unpredictable -> Collaboration Gamification	0.005	0.008	0.059	0.090	0.928
Avoidance -> Collaboration Gamification	0.108	0.109	0.048	2.235	0.026

D. Finding

Hypothesis 1 (H1) states that Purpose significantly positively affects Collaboration Gamification. Based on the test data (Table VI), the P-value = 0 is less than 0.05, and the T-statistics value = 3.721 is greater than 1.96. Thus, H1 is accepted. Purpose/Epic is the core drive where a person is motivated to take any action because there is an interest greater than himself and can also be caused because someone feels very needed [9]. Based on this research, epic meaning significantly affects someone's interest in running collaborative gamification applications. It can be interpreted that a person's motivation to collaborate is to develop the existence of his community and the external environment that

gets the benefits of collaboration. A person's motivation to collaborate is not always aimed at his interests. In taking advantage of this condition, developers can highlight features that can inform users about the specific goals and urgency of collaboration in the interests of many parties.

Hypothesis 2 (H2) states that Development significantly positively affects Collaboration Gamification. Based on the test data (Table VI), the P-value = 0.009 is smaller than 0.05 and the T-statistics value = 2.625 is greater than 1.96. Thus, H2 is accepted. Development is the core drive where a person is motivated to take any action because someone wants to achieve a certain achievement or achievement [9]. Based on this research, Development significantly affects someone's interest in running collaborative gamification applications. It can be interpreted that one of the motivations for someone to collaborate is to increase the acquisition of achievement and achievement. The developer can exploit this condition to add rewarding features for the achievement of the steps obtained by the user in the rules of mechanics.

Hypothesis 3 (H3) states that ownership significantly positively affects Collaboration Gamification. However, based on the test output data in Table VI, Ownership with Collaboration Gamification shows the P-value = 0.403 greater than 0.05 and T-statistics = 0.836 smaller than 1.96. Thus, H3 is rejected. Ownership is the core drive where someone is motivated to take any action because someone collects virtual goods and manages personalization more freely [9]. Based on this research, ownership does not affect a person's interest in running a collaborative gamification system. Users are not very interested in the customization that the app provides. The causes of the disinterest can be reviewed and become the subject of future research.

Hypothesis 4 (H4) states that Social Influence significantly positively affects Collaboration Gamification. Furthermore, based on the test output data in Table VI, Social Influence with Collaboration Gamification shows the P-value = 0 less than 0.05 and T-statistics = 5.707 greater than 1.96. Thus, H4 is accepted. Social Influence is the core drive where a person is motivated to take any action because it is driven by friends/partners/rivals in their environment [9]. Based on this research, Social Influence affects a person's interest in running a collaborative gamification system. The progress and activity of partners in the collaboration environment affect the user's interest in running the application. Developers can optimize the interaction features between users to facilitate communication. Installation of achievement progress in public places is also necessary to motivate and inspire users to imitate or pursue their partners.

Hypothesis 5 (H5) states that Unpredictability has a significant positive effect on Collaboration Gamification. However, based on the test output data in Table VI, Unpredictability with Collaboration Gamification shows the P-value = 0.928, which is greater than 0.05, and the T-statistics of 0.090 is smaller than 1.96. Thus, H5 is rejected. Unpredictability is the core drive where a person is motivated to take action by an unexpected opportunity that is of interest to him [9]. Based on this research, Unpredictability does not affect someone's interest in running a collaborative gamification system. Surprisingly, programs that provoke user interest do not affect the user's motivation to run the application. The causes of the disinterest can be reviewed and become the subject of future research.

Hypothesis 6 (H6) states that avoidance significantly positively affects Collaboration Gamification. Furthermore, based on the test output data in Table VI, Avoidance with Collaboration Gamification shows the P-value = 0.026, which is smaller than 0.05, and the T-statistics is 2.235, which is greater than 1.96. Meanwhile, the original sample value is 0.109 (positive). Thus, H6 is accepted. *Avoidance* is the core drive in which a person is motivated to take action for fear of missing out on specific opportunities [9]. So based on this research, avoidance affects a person's interest in running a collaborative gamification system. The concern of someone missing an opportunity is a motivation in running the application. Developers can take advantage of this by optimizing features that give confidence that every important event can be held at any time and announced in the system. It is strived for events to provide direct benefits so that users feel at a loss if they miss the opportunity.

IV. Conclusion

The results of the analysis of this study can be used as recommendations for developers of collaborative gamification systems to consider it as a reference in optimizing the role of core drives in their research. This analysis also found that user motivation in using collaborative gamification applications was not much motivated by the customization offered by the system. It is evidenced by Hypothesis 3, which investigates the effect of ownership being rejected. The rejection of Hypothesis 5 (Unpredictability) also shows that programs with uncertain offers do not affect user motivation. However, this finding contradicts the acceptance of H6 (Avoidance), which both have in common: offering something uncertain. However, the difference is that avoidance provides more certainty about the positive impact after doing it, so users are more attached to the core drive of Avoidance than Unpredictability. The acceptance of H2 (Development) and H1 (Epic Meaning) indicates that users interested in running collaborative gamification want to benefit themselves and are also motivated to advance their environment. Meanwhile, the acceptance of H4 (Social Influence) indicates that the role and progress of partners are sufficient to determine users' motivation in running collaborative gamification applications, which is usually caused by users wanting to pursue or imitate their partners (role models).

Future work could analyze the application of collaboration gamification with other measures to gain validation against collaboration applications. The next researcher can apply the Technology Acceptance Model (TAM) to determine this application's level of technology acceptance.

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