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# Gamification Design for Mobile Marketing Strategy in Food and Beverage Company Application

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**Abstract:** Coffee consumption in Indonesia in 2016 reached 250,000 tons per year, this can happen because drinking coffee has become a lifestyle for most Indonesian people. The increase in coffee consumption presents an opportunity for coffee sellers in Indonesia. Moreover, followed by the COVID-19 Pandemic which prompted an increase in the use of mobile devices, triggered a new marketing trend by utilizing mobile devices, namely mobile marketing. To be able to maintain and take advantage of this condition, a local Food and Beverages (F&B) company specialized in coffee continues to make progress, one of which is by utilizing information technology by releasing smartphone applications. Therefore, this paper investigates the impact of gamification as one of the important components in mobile marketing on consumer behavior intention within the context of a local Indonesian F&B company specializing in coffee, particularly in response to the increasing coffee consumption trend and the emergence of mobile marketing during the COVID-19 pandemic. The study utilizes Structural Equation Modeling (SEM) to analyze data collected from 248 users of the company's smartphone application. The findings suggest that game elements, customer engagement, perceived playfulness, and attitude significantly influence consumer behavior intention. Moreover, the study underscores the importance of evaluating the effect of gamification in guiding companies' implementation strategies. Strategy planning and prioritization are discussed using the RICE matrix.

Keywords: Mobile marketing; gamification; Covariance Based; Structural Equation Modeling; RICE matrix

## 1. Introduction

According to the Center for Agricultural Data and Information Systems of the Ministry of Agriculture, as adapted by Katadata, coffee consumption in Indonesia has reached 250.000 tons in 2016, with a constant growth of 10% from 2016 to 2021<sup>1)</sup>. This situation presents a promising opportunity for coffee companies operating in Indonesia. In 2020, despite the circumstances, not many people would have predicted that the Covid-19 virus would happen and cause a significant global impact, particularly on companies<sup>2)</sup>.

One of the opportunities that arise due to the COVID-19 pandemic is the increasing utilization of mobile devices and Internet. The internet creates new markets and increases opportunities by promoting creativity, sharing information, empowering users, building networks, and promoting international social interactions<sup>3)</sup>. This condition triggers a new marketing trend by utilizing mobile devices, namely mobile marketing strategies. According to research company Data Reportal, the number of connected mobile devices in Indonesia reached 370.1 million in January 2022, reflecting a 3.6 percent

increase from the previous year<sup>4)</sup>. To be able to maintain and take advantage of this condition, Food and Beverage (F&B) Company continues to make developments, including the utilization of information technology to release a smartphone application. However, the successful implementation of these smartphone applications needs a well-defined mobile marketing strategy to increase the number of users and engagement.

Mobile marketing includes SMS marketing, in-app advertising, mobile search marketing, location-based marketing, mobile display advertising, mobile social media marketing, mobile video marketing, mobile app marketing, and gamification. These strategies leverage mobile devices to promote products and engage users effectively<sup>5)</sup>.

Gamification is one of the most important components of mobile marketing. This concept can motivate individuals to create valuable behaviors, such as increasing customer loyalty<sup>7)</sup>. However, because gamification is still a relatively new concept, there is barely a standard in its application. Therefore, an evaluation of the effect of gamification needs to be done so that companies can use it as a reference in the

implementation of their strategies<sup>8</sup>).

According to sales data provided by a local F&B Company's internal team, the percentage of sales obtained from the mobile application remains relatively low at approximately 26%, whereas the competitor's company are achieving about 43%<sup>9</sup>. This shows a significant challenge should be addressed by the company. Therefore, it is necessary to evaluate the mobile marketing strategy in this F&B Company especially by exploring a gamification design.

The primary research question revolves around how to design an appropriate gamification mobile marketing strategy to increase customer behavior intention towards this local F&B Company. Firstly, it aims to identify the influential factors associated with gamification marketing activities within the F&B Company, specifically on the behavior intention platform. Secondly, it also seeks to provide valuable recommendations for implementing mobile marketing strategies that incorporate gamification within the company's application.

## 2. Literature Review

### 2.1 Mobile Marketing

According to Wibowo, R.A. (2019), marketing is a series of activities carried out by companies to promote their products or services to consumers<sup>10</sup>. The goal is to attract interest and influence consumer purchasing decisions by identifying needs and providing added value that differentiates a company's products from its competitors. Marketing involves researching, promoting, and selling products or services to the company's target market.

Therefore, it is necessary to attract target groups that can be marketed, one of which is from a mobile marketing strategy is through adding game or gamification features to businesses, especially those that operate online such as mobile marketing<sup>11</sup>. Until now, the impact of embedded game features in mobile marketing has been quite a lot of research. One of them was carried out by Naya et al (2022), the results of the study found that utilitarian values, hedonic values, and social values, spending less time/energy had a positive effect on the intention to use games<sup>12</sup>. The level of game usage will affect the amount of the average monthly spend on that platform. Through this research gamification can affect consumer experience, so marketers have an important role in making decisions related to gamification in marketing products and services<sup>12</sup>.

### 2.2 Gamification

In addition, as the effect of increasing use of technology, the trend of adopting mobile marketing is also increasing. One of the strategies is by utilizing gamification concept. A game is defined as a mix of strategy and payout structure aimed at imitating the human decision-making

process, with the idea that a participant seeks to maximize their personal advantage<sup>13</sup>. As defined by Treiblmaier et al. (2018), Gamification is the integration of game design aspects into non-game systems to increase users' intrinsic and external motivation<sup>14</sup>. There are two motivations in humans, namely extrinsic motivation, and intrinsic motivation<sup>15</sup>. Extrinsic motivation is a person's motivation to carry out an activity due to rewards that come from outside or externally, such as money, praise, and others. Meanwhile, intrinsic motivation is a person's motivation to carry out an activity to increase self-esteem or their internal perceptions such as feeling happy, comfortable, etc.

Hofacker et al. (2016) also stated that gamification, positioned as an innovative tool for connecting with customers and characterized as an emerging marketing trend, can drive people to engage in actions that lead to value creation, such as increasing loyalty<sup>7</sup>. Although gamification is able to increase loyalty, there are problems encountered in implementing gamification. The problem faced in implementing gamification is that academic research regarding the impact of gamification on marketing strategies is still very limited, so empirical evidence regarding the effect of gamification is also limited.

However, one of the concepts in gamification, Evolutionary Game Theory (EGT) has received greater attention and made significant advances over the previous decade. Furthermore, there has been rapid improvement in both the theory and practice of EGT<sup>16</sup>. Although EGT and gamification share a common thread in their emphasis on understanding and influencing behavior, EGT more focuses on the evolutionary dynamics of behaviors and strategies in populations, while gamification applies principles from game design and psychology to motivate and engage individuals.

### 2.3 Structural Equation Modeling

Structural Equation Modeling (SEM) is a statistical tool for investigating and understanding complex relationships between observed and unobserved factors<sup>17</sup>. It offers an efficient way to estimate multiple regression equations simultaneously by incorporating factor analysis, path analysis, and regression. The main objective of SEM is to investigate the connections between latent variables, the relationship between these latent variables and their indicators, as well as the impact of measurement errors on independent and dependent variables within a model<sup>18</sup>.

Researchers commonly conduct two types of studies: exploratory research and confirmation research. Confirmation research focuses on testing hypotheses based on existing concepts or theories, while exploratory research aims to identify patterns in the data. SEM can be employed in both types of research, utilizing either partial least squares (PLS-SEM) for exploratory research or covariance-based (CB-SEM) for confirmation studies<sup>18</sup>.

In this study, CB-SEM is employed as a statistical

method to examine the relationship between observed variables and latent constructs within a research model<sup>18</sup>. CB-SEM is widely used in various scientific disciplines, such as social sciences, business, and psychology<sup>19</sup>. The CB-SEM approach encompasses five stages, which include model specification, identification, estimation, model compatibility testing, and re-specify or modification<sup>18</sup>. This method allows researchers to test hypotheses about complex relationships between variables and evaluate the fit of models to the collected data.

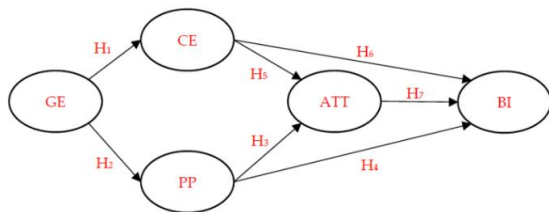
**2.4 RICE Matrix**

RICE (Reach, Impact, Confidence, and Effort) framework is a prioritized framework that measures the potential value of features, project ideas, and initiatives<sup>20</sup>. The RICE score assists product managers in estimating the value of project features or ideas to prioritize work. The RICE score is calculated by multiplying the Reach, Impact, Confidence factors, and dividing by Effort<sup>20</sup>. The Impact factor measures the extent to which a feature will impact customers, with a multiple-choice scale for scoring. Confidence measures a product team's confidence in the demonstrated reach and impact scores. Lastly, Effort measures the amount of time it takes to develop a feature. By using RICE, strategies can be prioritized in this study<sup>21</sup>.

**3. Research Methodology**

**3.1 Model Conceptualization**

The model used in this study was adopted from research conducted by Lin, Chi.-Wei et al (2023) on the influence of game elements (GE), customer engagement (CE), perceived playfulness (PP), and attitude (ATT) in behavior intention (BI)<sup>22</sup>. The model adopted and referenced for this study is as shown in Fig. 1 below.



**Fig. 1: Conceptual Model**

(Adapted from Lin, Chi.-Wei et al (2023)).

The model displays the relationship of game elements and behavior intention. This model was chosen because it has the object of research of one of the F&B companies with the demographics of respondents not much different because it is still in the Southeast Asian region, which is in Taiwan.

In the adopted model, there are a total of 5 latent variables and 22 indicators. Latent variables in the model include game elements (GE), customer engagement (CE),

perceived playfulness (PP), and attitude (ATT) in behavior intention (BI). Based on the conceptual model above, the hypothesis to be used and tested in this study is determined as follows in Table 1 below.

Table 1. Research Hypothesis  
(Adapted from Lin, Chi.-Wei et al (2023)).

Hypothesis	Information
H1	Game elements have a positive effect on customer engagement
H2	Game elements have a positive effect on perceived playfulness
H3	Perceived playfulness has a positive effect on attitude
H4	Perceived playfulness has a positive effect on Behavior Intention
H5	Customer engagement has a positive effect on attitude
H6	Customer engagement has a positive effect on behavior intention
H7	Attitude has a positive effect on Behavior intention

**3.2 Questionnaire Design**

Based on the theoretical models and definitions in this study, a questionnaire was designed. The research has 28 indicators as observed variables to measure eight latent variables, so there are a total of 28 questions asked of respondents. Respondents must answer questions using a 5-point Likert scale: (1) Strongly Disagree; (2) Disagree; (3) Neutral or Disagree; (4) Agree; (5) Strongly Agree as suggested by Bouranta, Chitiris, and Paravantis (2009). They argue that the implementation of 5-point rating scales could reduce confusion among respondents and enhances response rates<sup>23</sup>. The list of questions formulated is shown in Table 2.

Table 2. List of Questionnaire Questions  
(Adapted from Lin, Chi.-Wei et al (2023)).

	Var	Items
Game Elements	GE1	I think participating in this F&B company Rewards program is challenging.
	GE2	Participating in this F&B company Rewards program gives me a sense of accomplishment.
	GE3	I can receive membership information through this F&B company app.

Table 2. List of Questionnaire Questions (2)  
(Adapted from Lin, Chi.-Wei et al (2023)).

	Var	Items
Customer Engagements	CE1	I spent a lot of money on participating in this F&B company Rewards program.
	CE2	I have tracked the activities of this F&B company Rewards program.
	CE3	The activities of this F&B companies rewards program get my attention
	CE4	If I have a problem operating this F&B company Rewards program, I contact the F&Bs' departments and seek assistance.
	CE5	I will introduce this F&B company's Rewards program to my friends.
Perceived Playfulness	PP1	When I participate in this F&B company Rewards program, I often forget the work I must do.
	PP2	It makes me feel happy when I participate in this F&B company Rewards program.
	PP3	It makes me feel interested when I participate in this F&B company's Rewards program.
	PP4	I would lose track of time when I am absorbed in this F&B company Rewards program.
	PP5	It makes me curious when I'm using this F&B company Rewards program.
Attitude	AT1	I think this F&B brand can be trusted.
	AT2	I would choose this F&B branded products over unbranded products.
	AT3	Buying coffee-related products, this F&B brand is my first choice.
	AT4	I consider myself a loyal consumer of this F&B brand.
Behavior Intention	BI1	I will keep buying products from this F&B company.
	BI2	When someone asks for a recommendation, I would recommend this F&B app.
	BI3	I want to give this F&B app a high online rating.
	BI4	I will share the information on this F&B app on social media.
	BI5	I will recommend this F&B app to my family and friends.

### 3.3 Data Collection and Processing

After the validity and reliability of the questionnaire was tested, mass questionnaire distribution was carried out online using Google Form to Millennial and Generation Z individuals residing in Jabodetabek (Jakarta, Bogor, Depok, Tangerang, Bekasi) region. The questionnaire was distributed for one week from 14 until 22 March 2023, and managed to collect 247 responses.

The data obtained from the questionnaire responses provide an overview of respondents' characteristics, such as gender, domicile, recent education, and income. Most respondents in this study were women (48.6%) and lived in Jakarta (39%). The respondents' last education was dominated by S1 graduates (55%), and the majority had incomes in the range of Rp 0 to Rp 5,000,000 (74%). Most respondents were university students (32%), followed by private sector employees (24%).

After the distribution of the questionnaire, data processing was carried out using the Covariance Based Structural Equation Modeling (CB-SEM) method. The data processing phase includes sample fit tests to ensure the number of respondents have met research needs, and data normality tests to check data distribution. Next, an analysis was carried out using the bootstrap method to obtain an estimate of the statistical distribution. The next stage is the specification of measurement models and structural models. Measurement models describe the relationship between latent variables and observable variables, while structural models relate latent variables to one another.

## 4. Result

### 4.1 Measurement Model Testing

Confirmatory factor analysis (CFA) is a method for measuring the ability of observed variables or indicators to measure latent variables in a measurement model<sup>24</sup>. This analysis is obtained by verifying the validity and reliability of previously created measurement models. This step is implemented as a two-step approach where tests are first performed on the measurement model. The measurement model validity test aims to determine the extent to which the observed variable can validly measure the latent variable. The observed variable can be said to pass the validity test if the critical ratio value is >1.96 with a probability value (p) <0.05.

Based on the results obtained, the critical ratio for all observed variables is greater than 1.96 and the probability obtained is all lower than 0.05, where the probability value \*\*\* indicates that the probability is significant with a value of < 0.001. Therefore, the measurement model can be considered valid, and all observed variables can measure latent variables. The second test carried out was a reliability test using the values of Construct Reliability (CR) and Average Variance Extracted (AVE) as measuring instruments<sup>18</sup>.

Reliability is closely related to the consistency of observed variables in measuring latent variables. Thus, a construct can only be said to have a good reliability value if the construct reliability value  $\geq 0.7$  and the average variance extracted is  $> 0.5$ . Reliability in the range between 0.6 and 0.7 is acceptable if other indicators of the construct reliability model are good. Based on the results obtained, for all variables have CR values obtained greater than 0.6 and AVE values are all greater than 0.5. Thus, all latent variables are said to have passed the criteria and are considered reliable<sup>18)</sup>.

**4.2 Structural Model Testing**

The structural model is tested for its fitness using the Model Fitness Test, which looks at the Goodness of Fit Indices or the degree of fit between the research model and the sample data used. Index Goodness of fit used for measurement are GFI, AGFI, CFI, RMSEA, CMIN/DF, as well as Chi-Square and Probability. Table 3 shows the value condition for Goodness of Fit Indices and the results of the research model fit test, which has several fit sizes

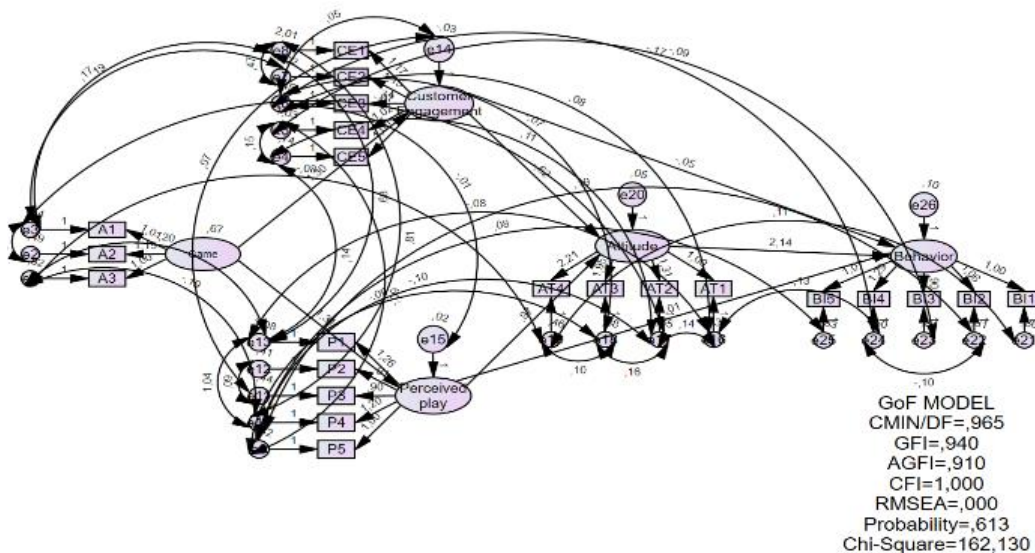
that are in the value marginal fit and bad fit.

The results of the model fit test show that the research model has one measure of fit that is good fit, but many still have results that are in marginal fit and bad fit values. Therefore, it is necessary to re-specify this research model so that the level of compatibility can be increased. Re-specify of the model can be done by looking at the value of modification indices obtained from this model<sup>18)</sup>.

**4.3 Model Respecifications**

Model re-specification needs to be done because there was a measurement index that is below marginal fit and bad fit. The re-specified model was carried out by linking the covariance relationship based on the value of modification indices generated by the IBM SPSS AMOS 26 software. In this study, 53 re-specifications were carried out based on the value of modification indices.

Figure 2 shows the path diagram from the path diagram obtained after re-specification or modification of the research model, where covariance was linked based on modification indices.



**Fig. 2:** Re-specify Model Result.

Table 3. Model Fit Test Results.

Fitness Index	Value Condition	Results Obtained
Chi Square	Small	564,16
Probability	$\geq 0,05$	0
GFI	$\geq 0,90$	0,8
AGFI	$\geq 0,90$	0,75
CFI	$\geq 0,90$	0,913
RMSEA	$\leq 0,08$	0,088
CMIN/DF	$\leq 2.00$	2,793

As a result of the re-specification carried out in the research model, there was a change in the value of the

degree of freedom (df) obtained. The degree of freedom (df) value obtained after re-specification is 90, which indicates that the model is still in the overidentified category because the value of  $df > 0$ . Overidentified model indicates that the research model can be retested to check the model fitness. Table 4 shows the results showing the results of the research model fit test after model re-specify<sup>18)</sup>.

Table 4. Model Fit Test Results After Re-specify.

Fitness Index	Value Condition	Results Obtained
Chi Square	Small	162,130
Probability	$\geq 0,05$	0,613

<b>GFI</b>	≥ 0,90	0,94
<b>AGFI</b>	≥ 0,90	0,91
<b>CFI</b>	≥ 0,90	1
<b>RMSEA</b>	≤ 0,08	0
<b>CMIN/DF</b>	≤ 2.00	0,965

Based on the table above, the results show that for all match sizes, the value condition is met for the specified model. All match size values fall under the good fit category. Model fit tests are generally accepted and considered good when three to four match indices are qualified<sup>18)</sup>. Thus, the research model can be said to have a good fit model and can be continued for further process and analysis in research.

#### 4.4 Hypothesis Testing

Causal relationship analysis in this study will be carried out by analyzing the value of p-value, direct effect, indirect effect, and total effect. P-value analysis was performed to assess and determine the effect of the relationship between two latent variables. Based on Hair et al., (2014). A latent variable can be said to have a significant effect on other latent variables if the p-value obtained is less than 0.05<sup>18)</sup>. Table 5 below is a table of results and p-values obtained for each hypothesis from hypothesis testing conducted with the bootstrap method in this study<sup>18)</sup>.

Table 5. P-Value Analysis for Hypothesis Testing.

Hypothesis	Estimate	S.E.	CR	p-value
H1	1,295	0,104	12,461	***
H2	1,313	0,097	13,596	***
H3	-0,619	0,316	-1,958	0,05
H4	0,971	0,32	3,03	0,002
H5	2,144	0,466	4,606	***
H6	-0,053	0,402	-0,133	0,894
H7	-0,01	0,507	-0,02	0,984

Based on Table 5 above, there are 7 hypotheses in total in this study and in order from top to bottom labeled H1, H2, H3, H4, H5, H6, and H7. Of all hypotheses, the H4 and H6 hypotheses must be rejected because the p-value obtained is greater than 0.05, while the other hypothesis is accepted because it meets the condition that the p-value is smaller or equal to 0.05. The hypothesis with a p-value \*\*\* shows that the p-value obtained is less than 0.001 or is at a confidence level greater than 95%. Therefore, the hypotheses H1, H2, H3, H5, and H7 are accepted because the p-values obtained for this hypothesis are significant between the two latent variables.

The study findings reveal that Game elements such as challenges, achievements, and feedback enhance user participation and interaction, resulting in higher customer

engagement and perceived playfulness. Perceived playfulness, in turn, influences users' attitudes towards the brand, creating positive emotions and fostering a favorable attitude. However, perceived playfulness does not directly affect behavior intention. That value shows that Behavioral intention resulting from Perceived playfulness is not have a positive influence. This is in accordance with research by Pleyers and Poncin (2020) where perceived playfulness helps users to build a positive attitude but does not directly influence their behavior intention<sup>25)</sup>.

On the other hand, customer engagement positively influences attitude, leading to increased fondness for the brand. According to Peter Ferdinand Drucker, —the figure who introduced corporate society and is considered the "father" of modern management—creating value for customers by prioritizing value over profits is the core of the marketing concept<sup>26)</sup>. This concept is closely related to Peter Ferdinand Drucker's definition of business goals, namely creating customers. Nevertheless, customer engagement does not significantly impact behavior intention. This is not the same as research conducted according to Yen et al. (2020), the author's analysis is that although customer engagements in human-computer interaction help users to build positive attitudes, they do not encourage users to continue using the application and recommend it<sup>28)</sup>. Attitude, driven by customer engagement and perceived playfulness, has a positive influence on behavior intention, indicating that customers who develop positive attitudes are more likely to exhibit desired behavioral intentions. These findings highlight the importance of incorporating game elements and fostering customer engagement to enhance customer attitudes and behaviors in the context of the food and beverage application.

#### 4.5 Strategy Recommendation Design

The next step is strategy recommendation design. The first thing in strategy formulation is to conduct a literature review that will be used as a reference in designing strategies based on the results obtained from the relationship of each latent variable in the data processing section. Based on the results of literature studies that will be used as a reference in designing strategy recommendations, then determined the relationship of literature with accepted hypotheses.

The first strategy uses storytelling to connect users with the brand during user onboarding<sup>29)</sup>. The third strategy is creating a leaderboard such as top spenders, this can increase user engagement to continue using the app<sup>30)</sup>. The fourth strategy uses referral code to increase user interaction and a pleasant experience. This is in accordance with Minnich's strategy<sup>31)</sup>. The fifth strategy uses interactive features to increase user adoption. This is in accordance with Lazard's strategy<sup>32)</sup>. The sixth strategy use humor to increase user interaction and a pleasant experience. This is in accordance with Wang Y's



strategy<sup>33</sup>). The eighth strategy uses unique experience to increase user experience, this strategy aligned with the Kim’s strategy<sup>34</sup>).

The results of the strategy recommendation literature

study are then sorted, developed, and deepened using the RICE matrix method to produce 9 strategy recommendations that will be validated in the next stage. Recommendations for these strategies include:

Strategy	Reach	Impact	Confidence	Effort	Rice Score
Use storytelling for onboarding new user	6	2	80%	1	9.6
Provide more details about the value proposition of the app (offline store pickup with online ordering) upon opening the app	3	1	80%	1	2.4
Making a leaderboard, such as a customer's top spender for 1 year, the prize can be a trip to the USA, smartphone etc	6	2	80%	2	4.8
Make a referral code	6	2	80%	2	4.8
Use interactive features: Incorporate interactive features into the app, such as swipe gestures, animations, and sound effects.	1.5	0.5	50%	1	0.375
Use humor	1.5	0.5	50%	1	0.375
Host online events: Host online events	3	1	80%	1	2.4
Offer a unique experience: Create a unique in-store experience	3	1	80%	1	2.4
Collaboration with local businesses: Collaboration with local	3	1	80%	1	2.4

Fig. 3: RICE Matrix.

After the development of strategy recommendations based on the author's brainstorming using existing hypotheses, validation and assessment of strategy recommendations were carried out using the RICE matrix with three experts from Food and Beverage Company. The results obtained 3 strategy priorities with the highest scores can be seen in the table above. The 3 highest score results were obtained to be implemented, while the reason for using three alternative choices as a final strategy recommendation was that the level of effectiveness was more optimal compared to four or five choices<sup>20</sup>).

### 5. Conclusion

To conclude, study aims to determine the relationship between gamification or game elements as a mobile marketing tool to customer attitudes and behavior intentions in the Food and Beverage Company Loyalty Program. The research adopted the research model conducted by Lin, Chi-wei (2023). Data processing was carried out using the Covariance Based Structural Equation Modeling (CB-SEM) method. The variables used in this study are Game elements, Customer engagement, Perceived playfulness, Attitude, and Behavior intention. There are 7 hypotheses in this study. Where from the results of the analysis of the relationship between variables, it was found that the most influential factors on gamification to increase customer behavior intention, judging from the magnitude of the p value, these factors are:

- 1 The relationship of Game elements to Customer engagement
- 2 The Relationship of Game Elements to Perceived Playfulness

This indicates that the design of strategy recommendations should emphasize increasing customer engagement and perceived playfulness resulting from

gamification strategies. Strategy recommendations are made based on the relationship between latent variables and literature review. Strategy formulation is done with the help of validation by experts using the RICE matrix. The strategy is then chosen based on the largest score weight. The selected strategies are:

1. Use storytelling to connect users with the coffee brand, such as the explanation behind the coffee product brand.
2. Making leaderboards, such as customer top spenders for 1 year, prizes can trip to USA, smartphones etc. However, this is necessary to be noticed by users not all users like it comparison system with people other<sup>35</sup>).
3. Use referral codes, each user has their own unique code to share with their friends to get special discounts.

### 6. Recommendation

The following are suggestions given for future research on similar topics:

1. Research can be done by identifying other variables that are considered important in game elements and can affect customer engagement and customer behavior intention.
2. Further research related to differences in effectiveness of existing gamification with gamification modifications that have been adjusted based on strategy recommendations in the previous chapter

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