www.bircu-journal.com/index.php/birci
Budapest International Research and Critics Institute-Journal (BIRCI-Journal)
Humanities and Social Sciences
ISSN 2615-3076 Online)
ISSN 2615-1715 (Print)
Budapest Institute

Analysis of Optimum Marketing Strategy with Game Theory (Case Study: Marketplace Indonesian)

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Abstract

the increasing number of pandemic cases in early 2021, has made online trading (marketplace) more widespread, making competition for marketplace companies getting tighter. Marketing strategy competition can be tested with a game theory approach. This study aims to determine the optimum marketing strategy in the marketplace so as to increase market share. From the data processing on the payoff matrix, there is no saddle point where the maximum value is not the same as the minimum value so that the pure strategy is not the optimum strategy. Furthermore, the data is processed using the POM-QM program to determine the value of the most optimum marketing strategy for each marketplace. Get games between marketplaces using a mixed strategy. In the Shopee and Tokopedia games, the optimal game value is 9%. In the second game, Shopee and Lazada, the optimal game value is 10%. In Shopee and Bukalapak games, the optimal game value is 8%. In the Shopee and Blibli games, the optimal game value is 16%. In the Tokopedia and Lazada games, the optimal game value is 10%. In the Tokopedia and Bukalapak games, the optimal game value is 9%. In the Tokopedia and Blibli games, the optimal game value is 9%. In the Lazada and Bukalapak games, the optimal game value is 11%. In the Lazada and Blibli games, the optimal game value is 13%. In the last game, Bukalapak and Blibli, the optimal game value was 14%.

Keywords
game theory; marketing strategy; marketplace.

I. Introduction

The increasing number of pandemic cases in early 2021 has made *online* (marketplace) more widespread. The results of a survey conducted by We Are Social in April 2021 revealed that Indonesia is the first country with the highest percentage of *e-commerce* in the world, followed by England, Italy, and then other countries. As many as 88.1% of internet users in Indonesia have used *e-commerce* to buy certain products in the last few months. This percentage is the highest in the world, where the average *e-commerce* is 78.6% (Lidwina, 2021).

The high number of *E-commerce* or *marketplace* in 2021 will make *marketplace* compete to attract *marketplace* by creating more varied features. Based on data in the *Top Brand Index* Phase 2 2021, it shows that the strength of the brand in the online buying and selling site category was won by Shopee with a percentage of 41.8%. Then followed by Tokopedia at 16.7%, Lazada 15.2%, Bukalapak 9.5% and BliBli 8.1% in order to compete competitively and increase users, an optimal marketing strategy is needed. The optimal marketing strategy is a weapon used by the company to win the competition in the market. One way that can be used to analyze the right marketing strategy is to apply game theory.

The application of game theory based on the marketing mix, namely *product, price,*

DOI: *https://doi.org/10.33258/birci.v5i3.6099*

promotion, *distribution*, *people*, *process*, and *physical evidence*, is one way that can facilitate in-depth analysis of market conditions in the hope of increasing sales by further increasing the superior variables between products, price, promotion, distribution, seller, process and physical form in the *marketplace*.

Based on the fairly tight competition for the marketplace, the right strategy is needed using the game theory method. This method compares each *marketplace* so that it can find out the advantages and disadvantages of each *marketplace*. By using this method, it is expected to determine the optimal marketing strategy in the *marketplace in order* to compete in the market. The purpose of this research is to determine

II. Review of Literature

2.1 Game

Theory Game theory is a study of decision making in which the outcome for the decision maker depends not only on what the decision maker does but also on the decisions of other players (Giordano *et al*., 2013). In game theory, players utilize mathematical techniques and logical thinking in order to arrive at the best possible strategy in making decisions to win the competition (Saifuddin, *et.al.*, 2018). The purpose of using game theory is to identify the optimal strategy for each player (Simamora, 2013).

The payoff value is the final result that occurs at the end of the game with respect to this reward, the game is classified into two kinds of categories, namely zero-sum *game and non-zero-sum games*. Game strategy in game theory is a particular tactic or plan of a player in reaction to the actions that may be taken by rival players, games are classified according to the number of strategies available to each player. If the row player has m possible strategies and the column player has n possible strategies, then the game is called an m × n game. There are two optimal strategy games, namely pure *strategy game and mixed strategy games*. A pure strategy game is a game in which each player's best preferred position is achieved by selecting a single strategy. So pure strategy is a game where each player uses one strategy with a probability of 1 while the probability of another strategy is zero (Ferguson, 2014).

2.2 Marketing Strategy

According to Armstrong and Kotler, (2012) marketing strategy is a company mindset where companies can create value for customers and can achieve profitable relationships with customers. Another opinion from Tjiptono, (2015) marketing strategy is a tool that is planned and designed fundamentally, where the design process is carried out as a company's effort to develop competitive advantage through a special program in order to serve the market on an ongoing basis. From the opinion above, it can be concluded that the marketing strategy is a series of designs that have the aim of marketing a product to the public, so that it can reach the target market, one of which is that the products offered to buyers can be sold and can generate maximum profits. Marketing is a process of planning and execution, starting from the conception stage, pricing, promotion, to the distribution of goods, ideas and services, to make exchanges that satisfy the individual and his institutions (Dianto in Asmuni et al, 2020). According to Tjiptono in Marlizar (2020) marketing performance is a function that has the greatest contact with the external environment, even though the company only has limited control over the company's environment. In the world of marketing, consumers are assets that must be maintained and maintained their

existence in order to remain consistent with the products we produce (Romdonny and Rosmadi, 2019).

2.3 Marketing Mix

According to Alma, (2016), *Marketing mixes* activities *marketing*, in order to find the maximum combination so that it can bring the most satisfying results. Another understanding from Kotler and Keller, (2016), *Marketing mix* can be interpreted as a set of controllable variables used by the company to pursue the desired level of sales in the target market. Based on the understanding of the experts above, it can be concluded that the marketing mix is a good marketing tool in a company, where the company is able to control it so that it can influence the response of the target market. The elements contained in the marketing mix consist of seven main aspects. The traditional four aspects relate to the marketing of goods, and the next three aspects relate to the expansion of the marketing mix. Four traditional aspects, namely: *product* (product), *price* (price), *distribution* (distribution), and *promotion* (promotion). There are three aspects, expansion of the marketing mix, *people* (human resources), *physical* evidence (physical evidence), and *process* (process) (Machali, 2018).

III. Research Method

To solve the problem in this study, the researcher used the Game Theory method. There are stages to overcome the problems in this research. Description related to problem solving is that field studies and literature studies are precursors to obtaining problem formulation and research objectives. Then the researcher identified the research variables. Collecting data using a questionnaire that begins with making a questionnaire, then distributing the questionnaire and then collecting it to see the results. After the questionnaires are collected, the data will first be tested for adequacy, validity and reliability of the data. If all the test data are met, then the calculation is continued with Game Theory which begins with a comparison based on competitive advantage, then makes a *pay off* to determine the value of the game so that *saddle* points occur, *saddle* points then processing is carried out with mixed methods assisted by *software* POM-QM. Then the optimal marketing strategy is generated for each *marketplace*. Then a discussion of the results that have been obtained is carried out so that conclusions and suggestions can be drawn.

IV. Result and Discussion

4.1 Questionnaire Dissemination Questionnaires

Were distributed *online* with the help of google forms. Questionnaires were distributed through *social media* with the criteria that the respondents had known the five *marketplaces* that were used as research objects. The return of the questionnaire that has been filled out by the respondent can be accessed through *Microsoft Excel* contained in the *google form.* In this study, 135 questionnaires have been filled out by respondents. A total of 125 questionnaires were declared appropriate, and as many as 10 questionnaires were not appropriate so they could not be continued, because the respondents answered that they had never used the five *marketplaces* which were the objects of this study. So that the data to be processed are 125 questionnaires

4.2 Data Sufficiency Test

From the results of the questionnaires filled out by 135 respondents, 125 questionnaires were filled out correctly. The researcher uses Bernoulli in the following equation:

$$N \frac{(1.96)^2.\left(\frac{125}{135}\right).\left(\frac{10}{135}\right)}{(0.05)^2} = 105.39\ 105$$

From the above calculation, it can be seen that the minimum sample is 105 respondents, meaning that the sample is said to be sufficient if there are 105 respondents or more.

4.3 Validity and Reliability Test

From the data as many as 125 pieces of questionnaires, it is obtained df = 125-2 = 123. From the error rate of 0.05%, it is obtained from a table of 0.1757. It can be seen in the following table:

Table 1. Test Results of The *Marketplace Shopee*

No	Attribute Strategy	r count	r table	Description
1	Completeness	0.621	0.1757	Valid
2	Brand Image	0.643	0.1757	Valid
3	Affordability	0.701	0.1757	Valid
4	Discount	0.591	0, 1757	Valid
5	Media	0.706	0.1757	Valid
6	*Event*	0.611	0.1757	Valid
7	Expedition	0.608	0.1757	Valid
8	Convenience	0.597	0.1757	Valid
9	Features	0.714	0.1757	Valid
10	Payment	0.1757	0.576	Valid
11	Authenticity	0.644	0.1757	Valid

From the eleven strategy attributes that have been tested, it can be seen that all the strategy attributes in the *marketplace* are declared valid.

Reliability testing was carried out using *software* SPSS 20.0test results *marketplace* are as follows:

Table 2. *Marketplace* Shopee

r alpa	r table	Description
0.854	0.1757	Reliable

In table 2 the value of *r alpha*> 0.1757 i.e., 0.854 > 0.1757, so the results of the questionnaire are declared reliable.

Table 3. Validity Test Results of *Tokopedia Marketplace*

No	Attribute Strategy	r count	r table	Description
1	Completeness	0.600	0.1757	Valid
2	Brand Image	0.1757	0.680	Valid
3	Affordability	0.747	0.1757	Valid

4	Discount	0.1757	0.739	Valid
5	Media	0.770	0 ,1757	Valid
6	*Event*	0.663	0.1757	Valid
7	Expedition	0.703	0.1757	Valid
8	Convenience	0.646	0.1757	Valid
9	Features	0.721	0.1757	Valid
10	Payment	Valid	0.680 0.1757	11
Auther icity	0.672	0.1757	Valid	Of

The eleven strategic attributes has been tested, it can be seen that all the strategy attributes on the *marketplace* Tokopedia

Reliability testing was carried out using *software* SPSS 20.0test *marketplace* Tokopedia

Table 4. Reliability Test Results *Marketplace* Tokopedia

r alpa	r table	Description
0.897	0.1757	Reliable

In table 4 the *r alpha*> 0.1757 i.e. 0.897 > 0.1757, so the results of the questionnaire are declared reliable.

Table 5. Validity Test Results of *Lazada Marketplace*

No	Attribute Strategy	r count	r table	Description
1	Completeness	Valid	0.593 0.1757	2
Brand	Image	0.617	0.1757	Valid
3	Affordability	Valid	0.543 0.1757	4
Discount	0.720	0.1757	Valid	5
Media	0.626	0	, 1757	Valid
6	*Event*	Valid	0.548 0.1757	7
Expedition	0.644	0.1757	Valid	8
Convenience	0.575	Valid	0.1757	9
Features	0.609	0.1757	Valid	10
Payment	0.573	0.1757	Valid	11
Authenticity	0.566	0.1757	Valid	Of

The eleven strategy attributes that have been tested, it can be seen that all the strategy attributes on the *marketplace* are declared valid.

Table 6. *Marketplace* Lazada

r alpa	r table	Information
0.829	0.1757	Reliable

In table 6 the value of *r alpha*> 0.1757 i.e. 0.829 > 0.1757, so the results of the questionnaire

Table 7. Results *Reliable*

declared	areStrategy	r count	r table	Description
1	Completeness	0.633	0.1757	Valid
2	Brand Image	0.1757	0.665	Valid
3	Affordability	0.1757	0.750	Valid
4	Discount	0.736	0.1757	Valid
5	Media	0.618	0.1757	Valid
6	*Event*	0.565	0.1757	Valid
7	Expedition	0.686	0.1757	Valid
8	Convenience	0.625	0.1757	Valid
9	Features	0.607	0.1757	Valid
10	Payment	0.534	0.1757	Valid
11	Authenticity	0.497	0.1757	Valid

From the eleven strategy attributes that have been tested, it can be seen that all the strategy attributes in the *marketplace* Bukalapak are declared valid.

Table 8. Results Of *Marketplace* Bukalapak

r alpa	r table	Description
0.852	0.1757	Reliable

In table 8 the value of *r alpha*> 0.1757 i.e. 0.852 > 0.1757, so the results of the questionnaire

Table 9. Test *Are*

declared	reliable	r count	r table	Description
1	Completeness	Valid	0.576 0.1757	2
Brand	Image	0.1757	0.684	Valid
3	Affordability	0.693	0.1757	Valid
4	Discount	0.745	0.1757	Valid
5	Media	0.669	0.1757	Valid
6	*Event*	0.607	0.1757	Valid
7	Expedition	0.746	0.1757	Valid
8	Convenience	0.594	0.1757	Valid
9	Features	0.637	0.1757	Valid
10	Payment	Valid	0.520 0.1757	11
Authenticity	0.484	Valid	0.1757	From

The eleven strategy attributes that have been tested; it can be seen that all the strategy attributes in the *marketplace* Bliblideclared valid.

Table 10. Results Of *Marketplace* Blibli

r alpa	r table	Description
0.850	0.1757	Reliable

In table X the value of *r alpha*> 0.1757 i.e. 0.850> 0.1757, so the results of the questionnaire are declared reliable

4.4 The Game Theory Calculations

Data in this study were obtained from the questionnaire results which contains the comparison of each attribute that exists between *marketplaces* being played. The following attributes are given to *game theory* in table XI.

Table 11. Attributes Used

Attributes in	Shopee	Tokopedia
Completeness of Products	X_1	Y_1
Brand Image	X_2	Y_2
Affordability	X_3	Y_3
Discounts	X_4	Y_4
Media	X_5	Y_5
Event	X_6	Y_6
Expedition	X_7	Y_7
Convenience	X_8	Y_8
Features	X_9	Y_9
Payment	X_{10}	Y_{10}
Authenticity	X_{11}	Y_{11}

Data processing is *Game theory* presented in the following table based on *output* POM-QM *for windows*. In the game between the *marketplaces* Shopee, Tokopedia, Lazada, Bukalapak and Blibli, there were 10 strategy games, namely Shopee against Tokopedia, Shopee against Lazada, Shopee against Bukalapak, Shopee against Blibli, Tokopedia against Lazada, Tokopedia against Bukalapak, Tokopedia against Blibli, Lazada against Bukalapak, Lazada against Blibli, and Bukalapak against Blibli, with the following results:

1. Shopee game against Tokopedia

Table 12. Shopee And Tokopedia Accounting Value Matrix

	Y1	Y2	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Min
X1	0.13	0.13	0.13	0.12	0.14	0.01	0.08	0.04	0.12	0.01	0.01
X2	0.09	0.36	0.03	0.08	0.33	0.14	0.24	0.07	0.35	0.07	0.03 (Maksimin)
X3	0.02	0.08	0.08	0.08	0.15	0.12	0.02	0.11	0.03	0.02	0.02
X4	0.01	0.03	0.04	0.04	0.05	0.04	0.06	0.12	0.09	0.12	0.01
X5	0.08	0.0	0.01	0.04	0.12	0.13	0.39	0.09	0.16	0.12	0.00
X6	0.12	0.04	0.14	0.01	0.26	0.08	0.19	0.08	0.03	0.18	0.01
X7	0.04	0.16	0.16	0.06	0.01	0.07	0.04	0.50	0.04	0.16	0.01
X8	0.04	0.17	0.08	0.12	0.01	0.12	0.10	0.01	0.04	0.02	0.01
X10	0.02	0.01	0.12	0.03	0.04	0.09	0.07	0.15	0.08	0.08	0.01
X11	0.08	0.12	0.06	0.09	0.02	0.11	0.13	0.15	0.21	0.19	0.02
Max	0.13	0.36	0.16	0.12 (minimaks)	0.33	0.14	0.39	0.5	0.35	0.19	

Source: primary data processed, 2022

From table 12 it can be seen that the maximum value of 0.03 is not the same as the minimum value of 0.12, meaning that the game cannot be solved using pure strategy. The next step is to finish by using a mixed strategy.

Table 13. Results Of Game Value for Mixed Strategies

	Y1	Y2	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	*Row Mix*
X1	0.13	0.13	0.13	0.12	0.14	0.01	0.08	0.04	0.12	0.01	0.23
X2	0.09	0.36	0.03	0.08	0.33	0.14	0.24	0.07	0.35	0.07	0.2
X3	0.02	0.08	0.08	0.08	0.15	0.12	0.02	0.11	0.03	0.02	0
X4	0.01	0.03	0.04	0.04	0.05	0.04	0.06	0.12	0.09	0.12	0
X5	0.08	0	0.01	0.04	0.12	0.13	0.39	0.09	0.16	0.12	0
X6	0.12	0.04	0.14	0.01	0.26	0.08	0.19	0.08	0.03	0.18	0.13
X7	0.04	0.16	0.16	0.06	0.01	0.07	0.04	0.5	0.04	0.16	0.05
X8	0.04	0.17	0.08	0.12	0.01	0.12	0.1	0.01	0.04	0.02	0.19
X10	0.02	0.01	0.12	0.03	0.04	0.09	0.07	0.15	0.08	0.08	0
X11	0.08	0.12	0.06	0.09	0.02	0.11	0.13	0.15	0.21	0.19	0.2
Column mix	0.24	0	0.22	0.21	0	0.3	0	0.02	0	0.01	
Value of game (to row)	0.09										

Source: primary data processed, 2022

From the results of mixed strategy acquisition, the game value is 0.09. Shopee needs to implement a marketing strategy of X1 of 0.23 or 23%, X2 of 0.2 or 20%, X6 of 0.13 or 13%, X7 of 0.05 or 5%, X8 of 0.19 or 19%, and X10 of 0.2 or 20% in order to have a maximum profit value of 0.09 or 9% While the *marketplace* (Y) needs to implement a marketing strategy of Y1 of 0.24 or 24%, Y3 with a profit of 0.22 or 22%, Y5 of 0.21 or 21%, Y6 of 3%, Y8 of 2% and Y10 of 0.1 or 1% in order to generate a minimum loss of 0.09 or 9%.

2. Shopee game against Lazada

Table 14. Shopee And Lazada Accounting Value Matrix

	Y1	Y2	Y3	Y4	Y5	Y6	Y8	Y9	Y10	Y11	Min
X1	0.32	0.06	0.14	0.15	0.09	0.10	0.04	0.04	0.09	0.09	0.04
X2	0.09	0.12	0.40	0.08	0.04	0.08	0.12	0.08	0.12	0.03	0.03
X3	0.05	0.08	0.28	0.08	0.10	0.16	0.13	0.08	0.04	0.07	0.04
X4	0.12	0.13	0.31	0.14	0.11	0.01	0.12	0.13	0.08	0.08	0.01 (minimaks)
X5	0.15	0.05	0.11	0.06	0.17	0.12	0.04	0.08	0.06	0.10	0.04
X6	0.02	0.13	0.09	0.12	0.07	0.10	0.07	0.04	0.08	0.08	0.02
X7	0.04	0.04	0.08	0.16	0.09	0.12	0.08	0.08	0.07	0.05	0.04
X8	0.05	0.07	0.10	0.06	0.24	0.15	0.07	0.16	0.13	0.12	0.05
X9	0.07	0.08	0.18	0.02	0.12	0.14	0.14	0.08	0.08	0.08	0.02
X11	0.04	0.15	0.32	0.11	0.20	0.06	0.16	0.08	0.08	0.10	0.04
Max	0.32	0.15	0.40	0.16	0.24	0.16	0.16	0.16	0.13 (maksimin)	0.12	

Source: primary data processed, 2022

From table 14 it can be seen that the maximum value of 0.01 is not the same as the minimum value of 0.12, meaning that the game cannot be solved using pure strategy. The next step is to finish using a mixed strategy assisted by *software* POM-QM

Table 15. Results of Game Value For Mixed Strategies

	Y1	Y2	Y3	Y4	Y5	Y6	Y8	Y9	Y10	Y11	*Row Mix*
X1	0.32	0.06	0.14	0.15	0.09	0.1	0.04	0.04	0.09	0.09	0.21
X2	0.09	0.12	0.4	0.08	0.04	0.08	0.12	0.08	0.12	0.03	0.03
X3	0.05	0.08	0.28	0.08	0.1	0.16	0.13	0.08	0.04	0.07	0
X4	0.12	0.13	0.31	0.14	0.11	0.01	0.12	0.13	0.08	0.08	0.01
X5	0.15	0.05	0.11	0.06	0.17	0.12	0.04	0.08	0.06	0.1	0
X6	0.02	0.13	0.09	0.12	0.07	0.1	0.07	0.04	0.08	0.08	0
X7	0.04	0.04	0.08	0.16	0.09	0.12	0.08	0.08	0.07	0.05	0.01
X8	0.05	0.07	0.1	0.06	0.24	0.15	0.07	0.16	0.13	0.12	0.35
X9	0.07	0.08	0.18	0.02	0.12	0.14	0.14	0.08	0.08	0.08	0
X11	0.04	0.15	0.32	0.11	0.2	0.06	0.16	0.08	0.08	0.1	0.39
Column mix	0	0.15	0	0.31	0	0.13	0.05	0.04	0.32	0	
Value of game (to row)	0.1										

Source: primary data processed, 2022

From the results of mixed strategies, the game value is 0.1. Shopee needs to implement a marketing strategy of X1 of 0.21 or 21%, X2 of 0.03 or 3%, X4 of 0.01 or 1%, X7 of 0.01 or 1%, X8 of 0.35 or 35%, and X11 of 0.39 or 39% in order to have a maximum profit value of 0.1 or 10% While the *marketplace* (Y) needs to implement a marketing strategy of Y2 with a profit of 0.15 or 15%, Y4 with a profit of 0.31 or 31% , Y6 of 0.13 or 13%, Y8 of 0.05 or 5%, Y9 of 0.04 or 4% and Y10 of 0.32 or 32% in order to generate a minimum loss of 0.1 or 10%.

3. Shopee game against Bukalapak

Table 16. Shopee And Bukalapak Obtaining Value Matrix

	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y9	Y10	Y11	Min
X1	0.26	0.07	0.09	0.44	0.06	0.18	0.01	0.05	0.03	0.43	0.01
X2	0.06	0.09	0.15	0.46	0.08	0.05	0.03	0.02	0.06	0.10	0.02
X3	0.43	0.03	0.07	0.42	0.02	0.12	0.11	0.07	0.04	0.02	0.02
X4	0.00	0.05	0.05	0.28	0.13	0.07	0.03	0.22	0.03	0.09	0.00
X5	0.06	0.06	0.22	0.11	0.05	0.03	0.02	0.01	0.03	0.02	0.01
X6	0.08	0.07	0.06	0.03	0.20	0.04	0.02	0.27	0.02	0.30	0.02
X7	0.09	0.41	0.02	0.32	0.06	0.05	0.10	0.11	0.19	0.02	0.02
X8	0.00	0.03	0.03	0.04	0.02	0.09	0.03	0.09	0.02	0.34	0.00
X9	0.02	0.07	0.15	0.46	0.20	0.11	0.03	0.03	0.20	0.04	0.02
											0.02
X11	0.03	0.03	0.02	0.19	0.28	0.12	0.16	0.06	0.07	0.10	(minimaks)
Max	0.43	0.41	0.22	0.46	0.28	0.18	0.16	0.27	0.20	0.43	
						(maksimin)					

Source: primary data processed, 2022

From table 16 it can be seen that the maximum value of 0.02 is not the same as the minimum value of 0.16 meaning the game cannot be solved using pure strategy. The next step is to finish using a mixed strategy assisted by *software* POM-QM

Table 17. Results Of Game Value for Mixed Strategy

	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y9	Y10	Y11	*Row Mix*
X1	0.26	0.07	0.09	0.44	0.06	0.18	0.01	0.05	0.03	0.43	0
X2	0.06	0.09	0.15	0.46	0.08	0.05	0.03	0.02	0.06	0.1	0
X3	0.43	0.03	0.07	0.42	0.02	0.12	0.11	0.07	0.04	0.02	0.1
X4	0	0.05	0.05	0.28	0.13	0.07	0.03	0.22	0.03	0.09	0
X5	0.06	0.06	0.22	0.11	0.05	0.03	0.02	0.01	0.03	0.02	0.17
X6	0.08	0.07	0.06	0.03	0.2	0.04	0.02	0.27	0.02	0.3	0.15
X7	0.09	0.41	0.02	0.32	0.06	0.05	0.1	0.11	0.19	0.02	0.1
X8	0	0.03	0.03	0.04	0.02	0.09	0.03	0.09	0.02	0.34	0
X9	0.02	0.07	0.15	0.46	0.2	0.11	0.03	0.03	0.2	0.04	0.15
X11	0.03	0.03	0.02	0.19	0.28	0.12	0.16	0.06	0.07	0.1	0.33
Column mix	0	0.02	0.32	0	0	0.08	0.33	0.2	0.05	0	
Value of game (to row)	0.08										

Source: primary data processed, 2022

From the results of the mixed strategy, the game value is 0.08. Shopee needs to implement a marketing strategy of X3 of 0.1 or 10%, X5 of 0.17 or 17%, X6 of 0.15 or 15%, X7 of 0.1 or 10%, X9 of 0.15 or 15%, and X10 of 0.33 or 33% in order to have a maximum profit value of 0.08 or 8% While *marketplace* Bukalapak (Y) needs to implement a marketing strategy of Y2 with a profit of 0.02 or 2%, Y3 with a profit of 0.32 or 32% , Y6 of 0.08 or 8%, Y7 of 0.33 or 33%, Y8 of 0.2 or 20% and Y9 of 0.05 or 5% in order to generate a minimum loss of 0.08 or 8%.

4. Shopee game against Blibli

Table 18. Shopee And Blibli Obtaining Value Matrix

	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Min
X1	0.05	0.26	0.06	0.30	0.23	0.04	0.10	0.29	0.22	0.31	0.04
X2	0.06	0.05	0.08	0.11	0.18	0.30	0.14	0.20	0.20	0.19	0.05
X3	0.17	0.08	0.02	0.13	0.05	0.28	0.26	0.15	0.10	0.04	0.02
X4	0.09	0.07	0.12	0.23	0.28	0.12	0.02	0.32	0.11	0.12	0.02
											0.07
X5	0.10	0.20	0.30	0.31	0.07	0.17	0.19	0.28	0.28	0.10	(minimaks)
X6	0.57	0.14	0.07	0.25	0.07	0.18	0.26	0.03	0.26	0.33	0.03
X7	0.14	0.06	0.06	0.05	0.24	0.01	0.29	0.07	0.30	0.18	0.01
X8	0.06	0.11	0.30	0.15	0.05	0.02	0.01	0.32	0.34	0.19	0.01
X9	0.57	0.17	0.15	0.21	0.03	0.26	0.16	0.12	0.09	0.28	0.03
X10	0.31	0.06	0.02	0.13	0.20	0.25	0.25	0.31	0.23	0.26	0.02
Max	0.57	0.26	0.30	0.31	0.28	0.30	0.29	0.32	0.34	0.33	
	(maksimin)										

Source: primary data processed, 2022

From table 18 it can be seen that the maximum value of 0.07 is not the same as the minimum value of 0.26, meaning that the game cannot be solved using pure strategy. The next step is to finish using a mixed strategy assisted by *software* POM-QM

Table 19. Results Of Game Value for Mixed Strategy

	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	*Row Mix*
X1	0.05	0.26	0.06	0.3	0.23	0.04	0.1	0.29	0.22	0.31	0.18
X2	0.06	0.05	0.08	0.11	0.18	0.3	0.14	0.2	0.2	0.19	0
X3	0.17	0.08	0.02	0.13	0.05	0.28	0.26	0.15	0.1	0.04	0
X4	0.09	0.07	0.12	0.23	0.28	0.12	0.02	0.32	0.11	0.12	0.16
X5	0.1	0.2	0.3	0.31	0.07	0.17	0.19	0.28	0.28	0.1	0.39
X6	0.57	0.14	0.07	0.25	0.07	0.18	0.26	0.03	0.26	0.33	0.01
X7	0.14	0.06	0.06	0.05	0.24	0.01	0.29	0.07	0.3	0.18	0
X8	0.06	0.11	0.3	0.15	0.05	0.02	0.01	0.32	0.34	0.19	0
X9	0.57	0.17	0.15	0.21	0.03	0.26	0.16	0.12	0.09	0.28	0.04
X10	0.31	0.06	0.02	0.13	0.2	0.25	0.25	0.31	0.23	0.26	0.21
Column mix	0.11	0.16	0.21	0	0.38	0.05	0.1	0	0	0	
Value of game (to row)	0.16										

Source: primary data processed, 2022

From the results of mixed strategy acquisition, the game value is 0.16. Shopee needs to implement a marketing strategy of X1 of 0.18 or 18%, X4 of 0.16 or 16%, X5 of 0.39 or 39%, X6 of 0.01 or 1%, X9 of 0.04 or 4%, and X10 of 0.21 or 21% in order to have a maximum profit value of 0.08 or 8% While the *marketplace* (Y) needs to implement a Y2 marketing strategy with a profit of 0.11 or 11%, Y3 with a profit of 0.16 or 16% , Y4 of 0.21 or 21%, Y6 of 0.38 or 38%, Y7 of 0.05 or 5% and Y8 of 0.1 or 10% in order to generate a minimum loss of 0.08 or 8%.

5. Tokopedia game against Lazada

Table 20. Matrix Of Tokopedia and Lazada Accounting Value

	Y1	Y2	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Min
X1	0.34	0.06	0.13	0.06	0.04	0.35	0.05	0.05	0.12	0.02	0.02
X2	0.13	0.28	0.08	0.11	0.32	0.16	0.40	0.05	0.06	0.05	0.05
X3	0.04	0.04	0.05	0.16	0.07	0.35	0.28	0.27	0.06	0.06	0.04
											0.06
X5	0.15	0.08	0.06	0.11	0.07	0.10	0.11	0.22	0.25	0.28	(Minimaks)
X6	0.07	0.32	0.12	0.04	0.10	0.04	0.09	0.12	0.00	0.27	0.00
X7	0.07	0.05	0.05	0.20	0.07	0.06	0.08	0.08	0.06	0.24	0.05
X8	0.12	0.11	0.01	0.15	0.04	0.08	0.10	0.13	0.01	0.20	0.01
X9	0.04	0.15	0.07	0.06	0.12	0.04	0.18	0.16	0.04	0.09	0.04
X10	0.05	0.11	0.08	0.09	0.08	0.06	0.04	0.14	0.08	0.15	0.04
X11	0.08	0.04	0.04	0.24	0.08	0.05	0.32	0.18	0.21	0.20	0.04
Max	0.34	0.32	0.13	0.24	0.32	0.35	0.40	0.27	0.25	0.28	
		(Maksimin)									

Source: primary data processed, 2022

From table 20 it can be seen that the maximum value of 0.06 is not the same as the minimum value of 0.13 meaning the game cannot be solved using pure strategy. The next step is to finish using a mixed strategy assisted by *software* POM-QM

Table 21. Results of Game Value For Mixed Strategies

	Y1	Y2	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	*Row Mix*
X1	0.34	0.06	0.13	0.06	0.04	0.35	0.05	0.05	0.12	0.02	0.36
X2	0.13	0.28	0.08	0.11	0.32	0.16	0.4	0.05	0.06	0.05	0.12
X3	0.04	0.04	0.05	0.16	0.07	0.35	0.28	0.27	0.06	0.06	0
X5	0.15	0.08	0.06	0.11	0.07	0.1	0.11	0.22	0.25	0.28	0.01
X6	0.07	0.32	0.12	0.04	0.1	0.04	0.09	0.12	0	0.27	0.28
X7	0.07	0.05	0.05	0.2	0.07	0.06	0.08	0.08	0.06	0.24	0
X8	0.12	0.11	0.01	0.15	0.04	0.08	0.1	0.13	0.01	0.2	0
X9	0.04	0.15	0.07	0.06	0.12	0.04	0.18	0.16	0.04	0.09	0
X10	0.05	0.11	0.08	0.09	0.08	0.06	0.04	0.14	0.08	0.15	0
X11	0.08	0.04	0.04	0.24	0.08	0.05	0.32	0.18	0.21	0.2	0.22
Column mix	0	0	0.58	0.14	0.09	0	0	0.14	0.05	0	
Value of game (to row)	0.1										

Source: primary data processed, 2022

From the results of mixed strategies, the game value is 0.1. Tokopedia needs to implement a marketing strategy of X1 of 0.36 or 36%, X2 of 0.12 or 12%, X5 of 0.01 or 1%, X6 of 0.28 or 28%, and X11 of 0.22 or 22% . in order to have a maximum profit value of 0.1 or 10%. Meanwhile *marketplace* (Y) needs to implement a marketing strategy of Y3 with a profit of 0.58 or 58%, Y4 with a profit of 0.14 or 14%, Y5 of 0.09 or 9% , Y9 of 14%, and Y10 of 0.05 or 5% in order to generate a minimum loss of 0.1 or 10%.

6. Tokopedia game against Bukalapak

Table 22. Tokopedia And Bukalapak Accounting Value Matrix

	Y1	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Min
X1	0.26	0.08	0.38	0.12	0.18	0.03	0.08	0.07	0.06	0.35	0.03
X2	0.07	0.23	0.06	0.03	0.10	0.05	0.32	0.18	0.12	0.18	0.03
X4	0.09	0.16	0.04	0.19	0.03	0.03	0.11	0.25	0.23	0.06	0.03
X5	0.13	0.06	0.18	0.10	0.04	0.06	0.02	0.32	0.31	0.21	0.02
X6	0.23	0.06	0.16	0.21	0.06	0.07	0.03	0.30	0.27	0.21	0.03
X7	0.18	0.22	0.28	0.04	0.17	0.02	0.04	0.25	0.21	0.06	0.02
X8	0.18	0.10	0.06	0.11	0.06	0.02	0.10	0.30	0.26	0.11	0.02
X9	0.13	0.07	0.02	0.17	0.07	0.06	0.09	0.34	0.26	0.06	0.02
X10	0.04	0.18	0.07	0.09	0.02	0.12	0.03	0.29	0.29	0.27	0.02
											0.05
X11	0.18	0.06	0.05	0.05	0.15	0.07	0.09	0.28	0.14	0.16	(Minimaks)
Max	0.26	0.23	0.38	0.21	0.18	0.12	0.32	0.34	0.31	0.35	
				(Maksimin)							

Source: primary data processed, 2022

From table 22 it can be seen that the maximum value of 0.05 is not the same as the minimum value of 0.18 meaning the game cannot be solved using pure strategy. The next step is to finish using a mixed strategy assisted by *software* POM-QM

Table 23. Results Of Game Value for Mixed Strategy

	Y1	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	*Row Mix*
X1	0.26	0.1	0.38	0.12	0.18	0.03	0.08	0.1	0.1	0.35	0.04
X2	0.07	0.2	0.06	0.03	0.1	0.05	0.32	0.2	0.1	0.18	0.11
X4	0.09	0.2	0.04	0.19	0.03	0.03	0.11	0.3	0.2	0.06	0
X5	0.13	0.1	0.18	0.1	0.04	0.06	0.02	0.3	0.3	0.21	0
X6	0.23	0.1	0.16	0.21	0.06	0.07	0.03	0.3	0.3	0.21	0.12
X7	0.18	0.2	0.28	0.04	0.17	0.02	0.04	0.3	0.2	0.06	0
X8	0.18	0.1	0.06	0.11	0.06	0.02	0.1	0.3	0.3	0.11	0
X9	0.13	0.1	0.02	0.17	0.07	0.06	0.09	0.3	0.3	0.06	0
X10	0.04	0.2	0.07	0.09	0.02	0.12	0.03	0.3	0.3	0.27	0.38
X11	0.18	0.1	0.05	0.05	0.15	0.07	0.09	0.3	0.1	0.16	0.35
Column mix	0	0	0.02	0.14	0.2	0.53	0.1	0	0	0	
Value of game (to row)	0.09										

Source: primary data processed, 2022

From the results of the mixed strategy, the game value is 0.09. Tokopedia needs to implement a marketing strategy of X1 of 0.04 or 4%, X2 of 0.11 or 11%, X6 of 0.12 or 12%, X10 of 0.38 or 38%, and X11 of 0.35 or 35% in order to have a maximum profit value of 0.09 or 9% While the *marketplace* (Y) needs to implement a marketing strategy of Y2 with a profit of 0.02 or 2%, Y5 with a profit of 0.14 or 14%, Y6 with a profit of 0.2 or 20% , Y7 of 0.53 or 53%, and Y8 of 0.1 or 10% in order to generate a minimum loss of 0.09 or 9%.

7. Tokopedia game against Blibli

Table 24. Tokopedia And Blibli Obtaining Matrix

	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Min
X2	0.10	0.07	0.06	0.10	0.18	0.07	0.14	0.02	0.04	0.10	0.02
X3	0.17	0.04	0.18	0.02	0.01	0.09	0.12	0.08	0.20	0.25	0.01
X4	0.14	0.02	0.01	0.02	0.14	0.04	0.13	0.09	0.26	0.03	0.01
X5	0.08	0.15	0.10	0.02	0.03	0.09	0.10	0.15	0.01	0.27	0.01
X6	0.04	0.08	0.20	0.09	0.05	0.05	0.14	0.05	0.18	0.22	0.04
X7	0.06	0.02	0.07	0.17	0.03	0.17	0.21	0.07	0.02	0.04	0.02
X8	0.09	0.14	0.05	0.04	0.20	0.22	0.02	0.22	0.03	0.13	0.02
X9	0.02	0.10	0.10	0.04	0.10	0.09	0.20	0.10	0.09	0.10	0.02
X10	0.10	0.18	0.12	0.06	0.05	0.04	0.09	0.05	0.35	0.10	0.04
X11	0.12	0.06	0.06	0.06	0.05	0.12	0.08	0.18	0.32	0.13	0.05 (Minimaks)
Max	0.17 (maksimin)	0.18	0.20	0.17	0.20	0.22	0.21	0.22	0.35	0.27	

Source: primary data processed, 2022

From table 24 it can be seen that the maximum value of 0.05 is not the same as the minimum value of 0.17 meaning the game cannot be solved using pure strategy. The next step is to finish using a mixed strategy assisted by *software* POM-QM

Table 25. Results Of Game Value for Mixed Strategy

	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	*Row Mix*
X2	0.1	0.07	0.06	0.1	0.18	0.07	0.14	0.02	0.04	0.1	0.14
X3	0.17	0.04	0.18	0.02	0.01	0.09	0.12	0.08	0.2	0.25	0.1
X4	0.14	0.02	0.01	0.02	0.14	0.04	0.13	0.09	0.26	0.03	0
X5	0.08	0.15	0.1	0.02	0.03	0.09	0.1	0.15	0.01	0.27	0
X6	0.04	0.08	0.2	0.09	0.05	0.05	0.14	0.05	0.18	0.22	0.04
X7	0.06	0.02	0.07	0.17	0.03	0.17	0.21	0.07	0.02	0.04	0.29
X8	0.09	0.14	0.05	0.04	0.2	0.22	0.02	0.22	0.03	0.13	0.21
X9	0.02	0.1	0.1	0.04	0.1	0.09	0.2	0.1	0.09	0.1	0
X10	0.1	0.18	0.12	0.06	0.05	0.04	0.09	0.05	0.35	0.1	0.21
X11	0.12	0.06	0.06	0.06	0.05	0.12	0.08	0.18	0.32	0.13	0
Column mix	0.24	0.1	0.18	0.32	0.09	0	0	0.07	0	0	
Value of game (to row)	0.09										

Source: primary data processed, 2022

From the results of the mixed strategy, the game value is 0.09. Tokopedia needs to implement a marketing strategy of X2 of 0.14 or 14%, X3 of 0.1 or 10%, X6 of 0.04 or 4%, X7 of 0.29 or 29%, X8 of 0.21 or 21% and X10 of 0.21 or 21% in order to have a maximum profit value of 0.09 or 9% While the *marketplace* (Y) needs to implement a Y2 marketing strategy with a profit of 0.24 or 24%, Y3 with a profit of 0.1 or 10%, Y4 is 0.18 or 18%, Y5 is 0.32 or 32%, Y6 is 0.09 or 9% and Y9 is 0.07 or 7% in order to generate a minimum loss of 0.09 or 9%.

8. Lazada's game against Bukalapak

Table 26. Matrix Of Lazada And Bukalapak Obtaining Value

	Y1	Y2	Y3	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Min
X1	0.07	0.19	0.08	0.02	0.06	0.05	0.05	0.02	0.03	0.10	0.02
X2	0.10	0.06	0.05	0.06	0.07	0.06	0.14	0.06	0.04	0.10	0.04
X3	0.05	0.04	0.11	0.02	0.05	0.07	0.04	0.12	0.06	0.08	0.02
X4	0.02	0.10	0.14	0.14	0.16	0.02	0.07	0.03	0.02	0.16	0.02
X5	0.06	0.18	0.18	0.22	0.48	0.10	0.10	0.19	0.02	0.06	0.02
X6	0.02	0.01	0.14	0.06	0.02	0.05	0.09	0.11	0.12	0.06	0.01
X7	0.08	0.18	0.07	0.02	0.07	0.02	0.07	0.04	0.06	0.16	0.02
X8	0.02	0.02	0.10	0.06	0.02	0.06	0.15	0.10	0.04	0.08	0.02
X9	0.11	0.25	0.10	0.02	0.05	0.06	0.13	0.09	0.08	0.06	0.02
											0.05
X11	0.24	0.14	0.06	0.22	0.05	0.28	0.09	0.34	0.25	0.14	(Minimaks)
Max	0.24	0.25	0.18	0.22	0.48	0.28	0.15	0.34	0.25	0.16	
						(Maksimin)					

Source: primary data processed, 2022

From table 26 it can be seen that the maximum value of 0.05 is not the same as the minimum value of 0.15 meaning the game cannot be solved using pure strategy. The next step is to finish using a mixed strategy assisted by *software* POM-QM

Table 27. Results Of Game Value For Mixed Strategies

	Y1	Y2	Y3	Y5	Y6	Y7	Y8	Y9	Y10	Y11	*Row Mix*
X1	0.07	0.19	0.08	0.02	0.06	0.05	0.05	0.02	0.03	0.1	0
X2	0.1	0.06	0.05	0.06	0.07	0.06	0.14	0.06	0.04	0.1	0
X3	0.05	0.04	0.11	0.02	0.05	0.07	0.04	0.12	0.06	0.08	0
X4	0.02	0.1	0.14	0.14	0.16	0.02	0.07	0.03	0.02	0.16	0.13
X5	0.06	0.18	0.18	0.22	0.48	0.1	0.1	0.19	0.02	0.06	0.21
X6	0.02	0.01	0.14	0.06	0.02	0.05	0.09	0.11	0.12	0.06	0
X7	0.08	0.18	0.07	0.02	0.07	0.02	0.07	0.04	0.06	0.16	0
X8	0.02	0.02	0.1	0.06	0.02	0.06	0.15	0.1	0.04	0.08	0.3
X9	0.11	0.25	0.1	0.02	0.05	0.06	0.13	0.09	0.08	0.06	0
X11	0.24	0.14	0.06	0.22	0.05	0.28	0.09	0.34	0.25	0.14	0.36
Column mix	0.06	0.03	0.22	0	0	0	0.41	0	0	0.27	
Value of game (to row)	0.11										

Source: primary data processed, 2022

From the results of mixed strategies, the game value is 0.11. Lazada needs to implement a marketing strategy of X4 of 0.13 or 13%, X5 of 0.21 or 21%, X8 of 0.3 or 30%, and X11 of 0.36 or 36% in order to have a maximum profit value of 0.11 or 11 % Meanwhile *marketplace* (Y) needs to implement a marketing strategy of Y1 with a profit of 0.06 or 6%, Y2 with a profit of 0.03 or 3%, Y3 of 0.22 or 22%, Y8 of 0.41 or 41% , and Y11 of 0.27 or 27% in order to generate a minimum loss of 0.11 or 11%.

9. Lazada game against Blibli

Table 28. Lazada And Blibli Accounting Value Matrix

	Y1	Y2	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Min
X1	0.08	0.17	0.09	0.10	0.05	0.12	0.09	0.17	0.15	0.07	0.05
X2	0.20	0.10	0.04	0.09	0.14	0.13	0.09	0.15	0.20	0.08	0.04
X3	0.21	0.21	0.07	0.10	0.05	0.13	0.15	0.12	0.19	0.10	0.05
X4	0.12	0.07	0.21	0.07	0.07	0.11	0.16	0.20	0.06	0.16	0.06
X5	0.10	0.13	0.20	0.26	0.13	0.40	0.13	0.12	0.09	0.16	0.09
X6	0.05	0.06	0.10	0.06	0.05	0.17	0.06	0.24	0.24	0.08	0.05
X7	0.10	0.18	0.08	0.10	0.15	0.07	0.16	0.06	0.17	0.17	0.06
X8	0.09	0.12	0.06	0.06	0.07	0.14	0.18	0.06	0.17	0.09	0.06
											0.04
X9	0.22	0.23	0.14	0.09	0.04	0.15	0.15	0.17	0.26	0.08	(Minimaks)
X11	0.26	0.16	0.21	0.20	0.10	0.09	0.39	0.42	0.10	0.10	0.09
Max	0.26	0.23	0.21	0.26	0.15	0.40	0.39	0.42	0.26	0.17	0.15
				(Maksimin)							

Source: primary data processed, 2022

From table 28 it can be seen that the maximum value of 0.04 is not the same as the minimum value of 0.15, meaning that the game cannot be solved using pure strategy. The next step is to finish using a mixed strategy assisted by *software* POM-QM

Table 29. Results Of Game Value for Mixed Strategies

	Y1	Y2	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	*Row Mix*
X1	0.08	0.17	0.09	0.1	0.05	0.12	0.09	0.17	0.15	0.07	0
X2	0.2	0.1	0.04	0.09	0.14	0.13	0.09	0.15	0.2	0.08	0.23
X3	0.21	0.21	0.07	0.1	0.05	0.13	0.15	0.12	0.19	0.1	0
X4	0.12	0.07	0.21	0.07	0.07	0.11	0.16	0.2	0.06	0.16	0
X5	0.1	0.13	0.2	0.26	0.13	0.4	0.13	0.12	0.09	0.16	0.45
X6	0.05	0.06	0.1	0.06	0.05	0.17	0.06	0.24	0.24	0.08	0
X7	0.1	0.18	0.08	0.1	0.15	0.07	0.16	0.06	0.17	0.17	0.25
X8	0.09	0.12	0.06	0.06	0.07	0.14	0.18	0.06	0.17	0.09	0
X9	0.22	0.23	0.14	0.09	0.04	0.15	0.15	0.17	0.26	0.08	0
X11	0.26	0.16	0.21	0.2	0.1	0.09	0.39	0.42	0.1	0.1	0.08
Column mix	0.11	0	0.12	0	0.75	0	0	0.01	0	0	
Value of game (to row)	0.13										

Source: primary data processed, 2022

From the results of mixed strategies, the game value is 0.13. Lazada needs to implement a marketing strategy of X3 of 0.23 or 23%, X5 of 0.45 or 45%, X7 of 0.25 or 25%, and X11 of 0.08 or 8% in order to have a maximum profit value of 0.13 or 13 % While *marketplace* (Y) needs to implement a marketing strategy of Y1 with a profit of 0.11 or 11%, Y3 with a profit of 0.12 or 12%, Y5 of 0.75 or 75%, and Y9 of 0.01 in order to resulting in a minimum loss of 0.13 or 13%.

10. Bukalapak game against Blibli

Table 30. Bukalapak And Blibli Accounting Value Matrix

	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Min
X1	0.38	0.39	0.36	0.13	0.16	0.23	0.26	0.28	0.35	0.17	0.13
X2	0.01	0.02	0.02	0.16	0.06	0.07	0.09	0.10	0.05	0.03	0.01
X3	0.01	0.02	0.18	0.08	0.08	0.01	0.06	0.06	0.08	0.07	0.01
X4	0.01	0.05	0.05	0.08	0.03	0.14	0.07	0.10	0.04	0.12	0.01
X5	0.14	0.02	0.03	0.01	0.09	0.03	0.06	0.06	0.12	0.02	0.01
X6	0.04	0.02	0.03	0.01	0.06	0.12	0.18	0.17	0.02	0.01	0.01
X7	0.07	0.09	0.03	0.13	0.06	0.03	0.12	0.05	0.10	0.06	0.03
X8	0.09	0.02	0.04	0.14	0.11	0.03	0.03	0.01	0.07	0.07	0.01 (Minimaks)
X9	0.03	0.06	0.07	0.15	0.10	0.02	0.05	0.06	0.08	0.06	0.02
X10	0.12	0.03	0.04	0.12	0.05	0.02	0.06	0.09	0.13	0.07	0.02
Max	0.38	0.39	0.36	0.16 (Maksimin)	0.16	0.23	0.26	0.28	0.35	0.17	

Source: primary data processed, 2022

From table 30 it can be seen that the maximum value of 0.01 is not the same as the minimum value of 0.16 meaning the game cannot be solved using pure strategy. The next step is to finish using a mixed strategy assisted by *software* POM-QM

Table 31. Game Value Results For Mixed Strategy

	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	*Row Mix*
X1	0.38	0.39	0.36	0.13	0.16	0.23	0.26	0.28	0.35	0.17	0.76
X2	0.01	0.02	0.02	0.16	0.06	0.07	0.09	0.10	0.05	0.03	0.21
X3	0.01	0.02	0.18	0.08	0.08	0.01	0.06	0.06	0.08	0.07	0.00
X4	0.01	0.05	0.05	0.08	0.03	0.14	0.07	0.10	0.04	0.12	0.00
X5	0.14	0.02	0.03	0.01	0.09	0.03	0.06	0.06	0.12	0.02	0.00
X6	0.04	0.02	0.03	0.01	0.06	0.12	0.18	0.17	0.02	0.01	0.00
X7	0.07	0.09	0.03	0.13	0.06	0.03	0.12	0.05	0.10	0.06	0.00
X8	0.09	0.02	0.04	0.14	0.11	0.03	0.03	0.01	0.07	0.07	0.00
X9	0.03	0.06	0.07	0.15	0.10	0.02	0.05	0.06	0.08	0.06	0.03
X10	0.12	0.03	0.04	0.12	0.05	0.02	0.06	0.09	0.13	0.07	0.00
Column mix	0.00	0.00	0.00	0.79	0.15	0.00	0.00	0.00	0.00	0.06	
Value of game (to row)	0.14										

Source: primary data processed, 2022

From the results of mixed strategy acquisition, the game value is 0.14. Bukalapak needs to implement a marketing strategy of X1 of 0.76 or 76%, X2 of 0.21 or 21%, and X9 of 0.03 or 3% in order to have a maximum profit value of 0.14 or 14% While the *marketplace* (Y) needs to implement Y5 marketing strategy with a profit of 0.79 or 79%, Y6 of 0.15 or 15%, and Y11 of 0.06 or 6% in order to generate a minimum loss of 0.14 or 14%.

V. Conclusion

From the results of the analysis and discussion that has been described, it can be concluded that the game between marketplaces uses a mixed strategy. In Shopee and Tokopedia games, the optimal game value is 9%. We recommend that Shopee companies need to implement the X1 strategy . Product completeness 23%, Brand Image 20%, Event 13%, Expedition 5%, Convenience 19% and Authenticity 20%. Meanwhile, Tokopedia applies a strategy of 24% product completeness, 22% discount, 21% media, 30% expedition, 3% features and 1% authenticity. In the second game, Shopee and Lazada, the optimal game value is 10%. It is recommended that Shopee companies need to implement a strategy of 21% product completeness, 3% brand image, 1% discount, 1% expedition, 35% convenience, and 39% authenticity. Meanwhile, Lazada applies a 15% brand image strategy, 31% discount, 13% event, 5% convenience, 4% features, 32% payment. In Shopee and Bukalapak games, the optimal game value is 8%. We recommend that Shopee companies need to implement a 10% Affordability strategy, 17% Media, 15% Events, 10% Expeditions. Features 15%, and Authenticity 33%. Meanwhile, Bukalapak needs to implement a strategy of 2% Brand Image, 32% Affordability, 8% Event, 33% Expedition, 20% Features, and 5% Payment. In the Shopee and Blibli games, the optimal game value is 16%. We recommend that Shopee companies need to implement a strategy of 18% product completeness, 16% discount, 39% media, 1% events, 4% features and 4% payments. Meanwhile, Blibli needs to implement a strategy of 11% Brand Image, 16% Affordability, 21% Discount, 38% Event, 5% Expedition, and 10% Convenience. In the Tokopedia and Lazada games, the optimal game value is 10%. It is recommended that Tokopedia companies need to implement a strategy of 36% product completeness, 12% brand image, 1% media, 28% event, and 22% authenticity. Meanwhile, Lazada needs to implement a 58% discount strategy, 14% media, 9% events, 14% features, and 5% payments. In the Tokopedia and Bukalapak games, the optimal game value is 9%. It is recommended that

the Tokopedia company implement a strategy of 4% product completeness, 11% brand image, 12% event, 38% payment, and 35% authenticity. Meanwhile, Bukalapak applies a 2% discount strategy, 14% media, 20% events, 53% expeditions, and 10% convenience. In the Tokopedia and Blibli games, the optimal game value is 9%. It is recommended that the Tokopedia company implement a strategy of Completeness 14%, Brand Image 10%, Events 4%, Expeditions 29%, Convenience 21%, and Payments 21%. Meanwhile, Blibli applies a strategy of 24% Brand Image, 10% Affordability, 18% Discount, 32% Media, 9% Events, and 7% Features. In the Lazada and Bukalapak games, the optimal game value is 11%. We recommend that Lazada implement a marketing strategy of 13% Discount, 21% Media, 30% Convenience, and 36% Authenticity. Meanwhile, Bukalapak applies a strategy of 6% Product Completeness, 3% Brand Image, 22% Affordability, 41% Convenience, and 27% Authenticity. In the Lazada and Blibli games, the optimal game value is 13%. We recommend that Lazada apply the 23% Affordability, 45% Media, 25% Expedition, and 8% Convenience strategies. Meanwhile, Blibli applies a strategy of 11% product completeness, 12% discount, 75% event, and 1% features. In the last game, Bukalapak and Blibli, the optimal game value was 14%. It is recommended that Bukalapak implement a 76% product completeness strategy, 21% brand image, and 3% features. Meanwhile, Blibli applies a 79% Media, 15% Event, and 6% Authenticity strategy.

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