

GAME THEORY ON MARKETING MIX STRATEGY BETWEEN BUKALAPAK, SHOPEE AND TOKOPEDIA

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Abstract

Technological developments are growing rapidly and over time it makes many activities easier such as transacting on the marketplace, several marketplaces in Indonesia, namely Bukalapak, Shopee and Tokopedia, intense competition makes management must be able to understand the concept of game theory. The design of this research is descriptive statistical analysis. The data collection method used in this study is a questionnaire. The data processed in the study are primary data obtained through the results of questionnaires distributed to respondents using a Likert scale. The variable of this research is the marketing mix which consists of product, price place, promotion, proses, people physical evidence, people opinion, and political power. The analysis technique used is validity test, reliability test and game theory matrix. The respondents obtained were 117 people, and the number of each user from Bukalapak, Shopee and Tokopedia was the same, namely 39 people. The results of this study indicate that the game value of Bukalapak and Shopee is 0.4, Bukalapak and Tokopedia is -0.1 and Shopee is -0.6. Bukalapak's strategy against Shopee is people, while Shopee is political power, then Bukalapak's strategy against Tokopedia is people, while Tokopedia is people opinion, and Shopee's strategy against Tokopedia is political power, while Tokopedia is people opinion.

Keywords: Strategy Management, Game Theory, Marketplace.

Abstrak

Perkembangan teknologi berkembang pesat dan seiring berjalannya waktu membuat banyak aktivitas menjadi lebih mudah seperti bertransaksi di marketplace, beberapa marketplace di Indonesia yaitu Bukalapak, Shopee dan Tokopedia, persaingan yang ketat membuat manajemen harus bisa memahami konsep teori permainan. Desain penelitian ini adalah analisis statistik deskriptif. Metode pengumpulan data yang digunakan dalam penelitian ini adalah kuesioner. Data yang diolah dalam penelitian adalah data primer yang diperoleh melalui hasil kuesioner yang dibagikan kepada responden dengan menggunakan skala Likert. Variabel penelitian ini adalah bauran pemasaran yang terdiri dari produk, harga tempat, promosi, proses, bukti fisik orang, opini orang, dan kekuatan politik. Teknik analisis yang digunakan adalah uji validitas, uji reliabilitas dan matrik teori permainan. Responden yang didapatkan sebanyak 117 orang, dan jumlah masing-masing pengguna dari Bukalapak, Shopee dan Tokopedia sama yaitu 39 orang. Hasil penelitian ini menunjukkan bahwa nilai permainan Bukalapak dan Shopee adalah 0,4, Bukalapak dan Tokopedia adalah -0,1 dan Shopee adalah -0,6. Strategi Bukalapak melawan Shopee adalah orang, sedangkan Shopee adalah kekuatan politik, kemudian strategi Bukalapak melawan Tokopedia adalah orang, sedangkan Tokopedia adalah pendapat orang, dan strategi Shopee melawan Tokopedia adalah kekuatan politik, sedangkan Tokopedia adalah pendapat orang.

Kata Kunci: Manajemen Strategi, Teori Permainan, Pasar.

INTRODUCTION

The development of technology in the current era is so rapid, many aspects and processes of life are shifting to the digital world, everyone today in fulfilling their life needs does not need to come physically and only by accessing the internet network on their cellphone, their life needs can be fulfilled. One of these developments is called

electronic commerce (E-commerce), a collection of technologies, applications and businesses that can connect a company or person to carry out many activities in it such as conducting transactions, exchanging goods or exchanging information and so on.

The concept of E-commerce makes the development of business processes, and finally creates a place where sellers and buyers can meet easily, the container is called a marketplace. In Indonesia, there are so many marketplaces that continue to grow and even some of the start-ups can become successful, and achieve unicorn status with a valuation of US\$ 1 million or Rp. 14.1 trillion, for example, Bukalapak and Tokopedia. Among many other start-ups, there are 2 marketplaces, namely Shopee and Tokopedia, which continue to compete with each other. According to iPrice, in the third quarter of 2021, it was stated that the number of visitors from Tokopedia was 158,136,700 and right below that was Shopee with 134,383,300 visitors. Another marketplace that is expected to compete with Shopee and Tokopedia is Bukalapak with 30,126,700 visitors. Other marketplaces in terms of the number of visitors are not as many as Bukalapak, Shopee and Tokopedia.

Based on the description above, therefore this study aims to formulate the game value and determine the optimal strategy between Bukalapak, Shopee and Tokopedia competition.

LITERATURE REVIEW

Marketing is included in one of the fields that make a company successful in attracting consumer interest and in a perfectly competitive market, of course there are various kinds of companies that intend to take their competitors' consumers in the same market, it makes companies have to take advantage of existing components both it internally or externally.

A set of components used by companies that aim to achieve effectiveness in fulfilling the needs of the target market consumers, and these components are interconnected with one another is called the marketing mix. The concept of the marketing mix was first introduced by Neil Borden (1964), and popularized by Jerome McCarthy (1968), the components of the marketing mix consist of product, price, promotion, and place, over time these components have been added, for example people, physical evidence and process added by Zeithaml and Bitner (1996), and there are also those who add more such as people opinion and political power, the concept of the marketing mix is currently being developed and has various models, even though it still refers to marketing strategy planning.

Game theory is a method used to analyze interactions between a number of players that show a strategy to ensure victory by maximizing personal wins to minimize the opponent's victory, when one player gets an advantage, simply put, the opposing player will get a loss. This theory was first introduced by an expert in the field of mathematics, namely Emile Biorel in 1921, and over time it experienced development, and was finally used in formulating competitive behavior strategies, as for the concept of game theory, namely:

1. The elements of game theory are:

1. The numbers in the game matrix show the results of different game strategies and are expressed in terms of effectiveness measures.
2. The game strategy of a player is judged as a reaction to the actions of the opposing party.
3. Players describe a chosen strategy framework.
4. The result of each game is declared fair if the value is zero and no player gets an advantage, or the win will be declared unfair if the value is not zero.

5. Strategy is declared dominant if every game in the strategy is superior to every game related to an alternative strategy. This dominant rule is used to reduce the size of the game matrix and the effort to calculate.
6. The optimal strategy is a comprehensive series of activities, so that it will cause a player to be in a favorable position without having to take into account the activities carried out by the opposing party.
7. The model of this game aims to identify the optimal strategy for each player.

2. Game theory matrix

This game theory discusses the behavior between two or more players who are competing against strategies with various choices that can affect the opposing party's strategy, in this game there are two decision makers who are confronted with information and values from the opposing party. A player will instinctively position himself as the party who will win the game, player 1 is positioned as the player who will maximize the victory, while player 2 is positioned as the player who will minimize the loss of the game.

3. Game type

There are 2 types of strategies in this game, namely:

1. Players with pure strategy are games with the best alternative positions for each player achieved through a single strategy. Row players identify their optimal strategy with maximin criteria, while column players identify their optimal strategy with minimum criteria, thus creating a saddle point between the two sides.
2. Players with mixed strategies, namely games that have opportunities by showing the proportion of time or parts used in carrying out the strategy, due to the absence of a saddle point between the two sides, the solution is carried out using graphical methods, analysis, matrix algebra and linear programming.

Previous research was conducted by Wahyuni Windasari and Tuti Zakiyah (2020), the research was motivated by the existence of competition between companies in the field of online transportation services, namely Grab and Go-Jek, and this study aims to formulate an optimal strategy between the two parties. Data collection in this study used a survey method with a questionnaire containing 8 attributes in it. The research method uses Game Theory. The results of this study are that the optimal strategy value is 34, and the mixed strategy used by the winning player is Grab in increasing the victory by using the convenience attribute and promo vouchers which are 50% each, while the losing player is Go-Jek in minimizing losses. using the attributes of 20% cost-effective and 80% security.

Other previous research conducted by Ichan Wahyuti and Yustina Ngatilah (2020), this research was also motivated by the competition between 3 packaged liquid milk products, namely Frisianflag, Indomilk and Greenfield. Data collection in this study used a questionnaire containing 18 attributes in it. The research uses Fuzzy Logic and Game Theory methods. The results of this research are that there are saddle points which have the same maximin and minimax values between products, the marketing attribute favored by Frisianflag is the freshness of milk, while Indomilk is advertising and Greenfile is the availability of milk.

METHOD

Research design

The design used in this research is descriptive statistical analysis.

Population and sample

The population in this study are users of Bukalapak, Shopee and Tokopedia. The sampling technique used is convenience sampling through non-probability sampling technique used to collect data in this study. The sample obtained in this study were 117 respondents consisting of 39 respondents using Bukalapak, 39 respondents using Shoopee and 39 respondents using Tokopedia.

Variable Operations

The variable of this research is the marketing mix which consists of product, price place, promotion, proses, people physical evidence, people opinion, and political power:

Table 1. Research Variables

No	Variable	Description
1	Product	Goods or services accompanied by quality, impression and benefits offered to every consumer
2	Price	Determination of the price of goods or services that are not too high or low offered to every consumer
3	Place	A place related to a series of operational activities of the company
4	Promotion	Promotional activities carried out and adjusted to market segments that have been determined from the start
5	Proses	The company's ability to produce goods or services as well as services to every consumer
6	People	Human resources involved in all activities carried out by the company
7	Physical evidence	The ability to arrange something visible in an effort to attract consumer interest
8	People opinion	The depiction of the wider community that forms an image of the company
9	Political power	The company's ability to participate in national or international activities that have an impact on business continuity

Data collection technique

The data processed in the study are primary data obtained through the results of questionnaires distributed to respondents using a Likert scale, namely 1 - 5 (Strongly disagree - strongly agree).

Data analysis technique

The data analysis techniques used in this study are:

Validity test

The steps in conducting the validity test are:

- a. Recapitulation of the results of the questionnaire

- b. Input the data from the questionnaire results on SPSS
- c. Select Analyze - Correlate - Bivariate
- d. Output

Reliability test

The steps in conducting a reliability test are:

- a. Recapitulation of the results of the questionnaire
- b. Input data on SPSS
- c. Select Analyze – Scale - Reliability analysis
- d. Output

Game theory matrix

The formulation of the game theory matrix uses the following calculations:

$$\frac{A_1 - A_2}{n} \times 100\%$$

Where :

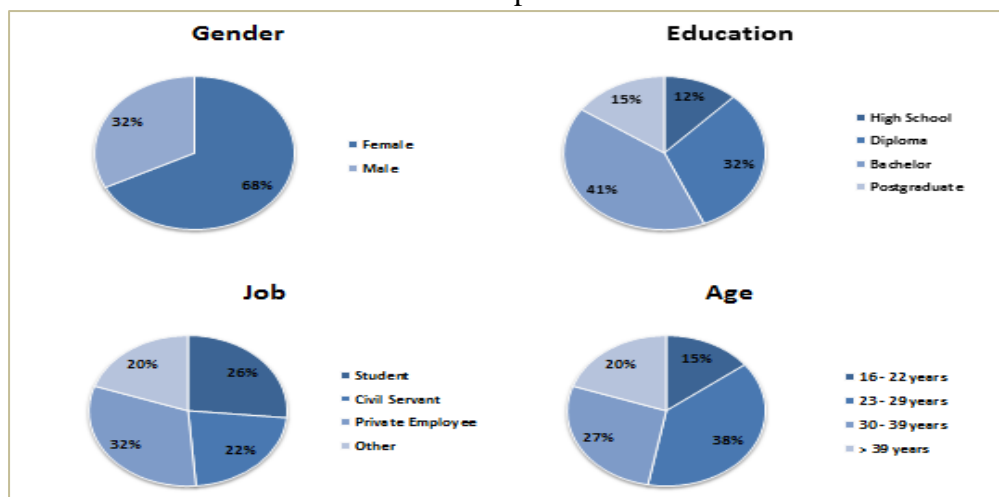
- A1 : average of a variable from line player
 A2 : average of a variable from column player
 n : Number of respondents

RESULTS AND DISCUSSION

Respondent Profile

Respondents obtained in this study are as follows :

Picture 1. Respondent Profile



Through the picture above, it was found that respondents based on gender, namely women amounted to 79 people (68%), while men amounted to 39 people (32%), respondents based on education, namely high school totaled 14 people (12%), diplomas amounted to 37 people (32%), bachelors totaling 48 people (41%), and postgraduates totaling 18 people (15%), respondents based on occupation, namely students totaling 31 people (26%), civil servants totaling 26 people (22%), private employees 27 people

(32%), and the rest were 23 people (20%), and the last respondent based on age, namely 16-22 years was 17 (15%), 23-28 years was 45 people (38%), 29-38 years was 32 people (27%), and >39 years old were 23 people (20%). Most of the respondents in this study were women with a bachelor's education and worked as a private employee aged around 23 – 28 years.

Validity Test

Table 2. Validity Test

No	Bukalapak	Shopee	Tokopedia	R Table	Description
1	0,797	0,868	0,866	0,316	Valid
2	0,970	0,951	0,836	0,316	Valid
3	0,880	0,909	0,908	0,316	Valid
4	0,939	0,799	0,798	0,316	Valid
5	0,765	0,904	0,933	0,316	Valid
6	0,875	0,812	0,848	0,316	Valid
7	0,876	0,888	0,952	0,316	Valid
8	0,884	0,856	0,872	0,316	Valid
9	0,801	0,867	0,739	0,316	Valid

Through table 2, it is stated that each item on the questionnaire given to respondents all has a value above 0.316, meaning that each item has accuracy. The average value of all Bukalapak items is 0.865, while the highest item value is 0.970 (Price) and the lowest item value is 0.765 (Process). The average value of all Shopee items is 0.873, while the highest item value is 0.951 (Price) and the lowest item value is 0.799 (Promotion). The average value of all Tokopedia items is 0.861, while the highest item value is 0.952 (Physical Evidence) and the lowest item value is 0.739 (Political Power).

Reliability Test

Table 3. Reliability Test

No	Instrument	Alpha Cronbach	Standar reliabel	Description
1	Bukalapak	0,954	0,60	Reliabel
2	Shopee	0,948	0,60	Reliabel
3	Tokopedia	0,959	0,60	Reliabel

Through table 3, it is stated that all the instruments used in this study have Cronbach's Alpha values above 0.6, meaning that each instrument can be accounted for. The average of the instruments in this study is 0.947. The instrument with the lowest score was 0.948 (Shopee), while the instrument with the highest score was 0.959 (Tokopedia).

Game Theory Matrix

The results of the respondents' answers to the questionnaire are then arranged to form a matrix through simple calculations, while the matrix of the competition between Shopee and Tokopedia is as follows :

Table 4. Bukalapak Matrix with Shopee

		Shopee									Min
		Y ₁	Y ₂	Y ₃	Y ₄	Y ₅	Y ₆	Y ₇	Y ₈	Y ₉	
Bukalapak	X ₁	0,10	0,09	0,12	0,06	0,09	0,06	0,10	0,06	0,01	0,01
	X ₂	0,09	0,07	0,10	0,04	0,07	0,04	0,09	0,04	0,00	0,00
	X ₃	0,10	0,09	0,12	0,06	0,09	0,06	0,10	0,06	0,01	0,01
	X ₄	0,09	0,07	0,10	0,04	0,07	0,04	0,09	0,04	0,00	0,00
	X ₅	0,06	0,04	0,07	0,01	0,04	0,01	0,06	0,01	-0,03	-0,03
	X ₆	0,13	0,12	0,15	0,09	0,12	0,09	0,13	0,09	0,04	0,04
	X ₇	0,10	0,09	0,12	0,06	0,09	0,06	0,10	0,06	0,01	0,01
	X ₈	0,12	0,10	0,13	0,07	0,10	0,07	0,12	0,07	0,03	0,03
	X ₉	0,07	0,06	0,09	0,03	0,06	0,03	0,07	0,03	-0,01	-0,01
Max		0,13	0,12	0,15	0,09	0,12	0,09	0,13	0,09	0,04	

Source: private document

Through table 4 above, it is explained that the game value of Bukalapak's competition with Shopee is 0.04, the strategy used by Bukalapak in increasing victory is with people, while the strategy used by Shopee in minimizing defeat is with political power. Furthermore, the matrix of the competition between Shopee and Tokopedia is as follows:

Table 5. Bukalapak Matrix with Tokopedia

		Tokopedia									Min
		Y ₁	Y ₂	Y ₃	Y ₄	Y ₅	Y ₆	Y ₇	Y ₈	Y ₉	
Bukalapak	X ₁	0,04	-0,01	0,00	-0,03	0,01	-0,03	0,01	-0,04	0,06	-0,04
	X ₂	0,03	-0,03	-0,01	-0,04	0,00	-0,04	0,00	-0,06	0,04	-0,06
	X ₃	0,04	-0,01	0,00	-0,03	0,01	-0,03	0,01	-0,04	0,06	-0,04
	X ₄	0,03	-0,03	-0,01	-0,04	0,00	-0,04	-0,06	-0,06	0,04	-0,06
	X ₅	0,00	-0,06	-0,04	-0,07	-0,03	-0,07	-0,03	-0,09	0,01	-0,09
	X ₆	0,07	0,01	0,03	0,00	0,04	0,00	0,04	-0,01	0,09	-0,01
	X ₇	0,04	-0,01	0,00	-0,03	0,01	-0,03	0,01	-0,04	0,06	-0,04
	X ₈	0,06	0,00	0,01	-0,01	0,03	-0,01	0,03	-0,03	0,07	-0,03
	X ₉	0,01	-0,04	-0,03	-0,06	-0,01	-0,06	-0,01	-0,07	0,03	-0,07
Max		0,07	0,01	0,03	0,00	0,04	0,00	0,04	-0,01	0,09	

Through table 5 above, it is explained that the game value of Bukalapak's competition with Tokopedia is -0.01, the strategy used by Bukalapak in increasing victory is with people, while the strategy used by Tokopedia in minimizing losses is with people's opinion.

Finally, the matrix of the competition between Shopee and Tokopedia is as follows:

Table 6. Matrix Shopee with Tokopedia

		Tokopedia									Min
Shopee		Y ₁	Y ₂	Y ₃	Y ₄	Y ₅	Y ₆	Y ₇	Y ₈	Y ₉	
	X ₁	-0,06	-0,12	-0,10	-0,13	-0,09	-0,13	-0,09	-0,15	-0,04	-0,15
	X ₂	-0,04	-0,10	-0,09	-0,12	-0,07	-0,12	-0,07	-0,13	-0,03	-0,13
	X ₃	-0,07	-0,13	-0,12	-0,15	-0,10	-0,15	-0,10	-0,16	-0,06	-0,16
	X ₄	-0,01	-0,07	-0,06	-0,09	-0,04	-0,09	-0,04	-0,10	0,00	-0,10
	X ₅	-0,04	-0,10	-0,09	-0,12	-0,07	-0,12	-0,07	-0,13	-0,03	-0,13
	X ₆	-0,01	-0,07	-0,06	-0,09	-0,04	-0,09	-0,04	-0,10	0,00	-0,10
	X ₇	-0,06	-0,12	-0,10	-0,13	-0,09	-0,13	-0,09	-0,15	-0,04	-0,15
	X ₈	-0,01	-0,07	-0,06	-0,09	-0,04	-0,09	-0,04	-0,10	0,00	-0,10
X ₉	0,03	-0,03	-0,01	-0,04	0,00	-0,04	0,00	-0,06	0,04	-0,06	
Max	0,03	-0,03	-0,01	-0,04	0,00	-0,04	0,00	-0,06	0,04		

Through table 6 above, it is explained that the game value of Shopee's competition with Tokopedia is -0.06, the strategy used by Shopee in increasing victory is political power, while the strategy used by Tokopedia in minimizing losses is with people's opinion.

CONCLUSION

Based on the description above, it is concluded that the game value of Bukalapak's competition with Shopee is 0.04, and the strategy used by Bukalapak is people, while the strategy used by Shopee is political power. The game value of Bukalapak's competition with Tokopedia is -0.01 and the strategy used by Bukalapak is people, while the strategy used by Shopee is people opinion. The game value of Shopee's competition with Tokopedia is -0.06 and the strategy used by Shopee is political power, while the strategy used by Tokopedia is people's opinion.

LIMITATION & FURTHER RESEARCH

The limitation of this study lies in the number of respondents who are less able to describe the actual situation, therefore it is hoped that further research will be able to obtain more respondents, and can also add other analytical techniques, such as importance performance analysis (IPA), fuzzy logic and so on that can complement research related to game theory, Future research could also be in developing complex game theory.

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