

Business Game that Won the Largest Telecommunication Provider in Indonesia

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ABSTRACT

Indonesian mobile telecommunication industry has grown very rapidly in recent years and it is expected to continually be so. As it keeps growing, the competition among the providers become more stringent. Therefore, companies need to know the extent to which competitive level they are against the competitors in gaining market share. So, it is necessary to have an appropriate marketing strategy for the product, one of the approaches to be used is the game theory. There are several things that become the main attributes for telecommunication companies to focus on namely price, coverage area, customer based, and customer service. Thus, the purpose of this study is to determine the most accentuated attribute for consumers in using the provider services. This research method is quantitative and the method for collecting the data is through online questionnaires for the respondents who using Telkomsel and Indosat as their providers. The data was processed using analytical technique with the payoff matrix and using the theory of pure strategy game. The result of data processed using game theory is that Telkomsel has the advantage on the attribute of customer service, but Indosat does not have any advantage in facing Telkomsel.

Keywords: Telecom Industry, Mobile Operator, Game Theory, Pure Strategy Game

1. INTRODUCTION

The telecommunication sector continues to be an important force (Fakher, 2016), for the growth, innovation and disruption in a number of technology industries (Deloitte, 2017). A huge energy and turmoil have colored the telecommunication industry in Indonesia for more than a decade. Both the number of subscribers and revenue have significantly and strongly grown. The more important things are the changes in the regulatory regime and restructuration of the operators which have started to positively have effect on the industry. The mobile phone market has been growing with a positive trend (Harpur, 2016).

Mason's analysis estimated the penetration rate will reach 158% by the end of 2019, increasing from 325 million in 2013 to 411 million in 2019 (Britama, 2015). Furthermore, Britama (2015) mentioned that the growth is driven by the growing coverage area and the declining tariff of wireless services as a result of tight competition among the telecom operators.

Indonesia is one of the countries with the largest number of mobile phone users in the world. The number of mobile phone subscribers in Indonesia has reached 281.9 million exceeding its total population which is only 250 million. The number illustrates that every person in Indonesia owns 1.13 units of mobile phone (Ramadan, 2016).

Indonesia currently has seven mobile operators which are Telkomsel, Indosat Ooredoo, Tri, XL Axiata and Smartfren (Telkom, 2015). Telkomsel was still the king of the mobile phone operators in Indonesia in 2016. In the first half of 2016 financial statements, Telkomsel subscribers totaled 157.4 million, or approximately 46 percent of total mobile subscribers in the country. With its widest network of base transceiver stations (BTS) reaching the remote areas of the archipelago has made Telkomsel customers able to outperform other operators. The tendency of people to use more than one phone card makes the number of cellular subscribers in Indonesia outnumber the population. Having the population of around 250 million, but the mobile phone subscribers in Indonesia are more than 300 million.

In 2017, Telkomsel is also targeting growth in the number of customers around 10 percent compared to 2016. By September 2016 the total number of subscribers reached 163.7 million across Indonesia. A total of 76.4 million of the subscribers have been using the 3G / 4G (Indotelko, 2016).

Indosat Ooredoo has successfully recorded its growth in the mobile business amounted to 11.9% which was boosted by the increased revenue from data, phone, SMS and VAS (Value Added Services). Indosat Ooredoo also noted the success in achieving of 81.6 million customers, an increase of 12.6 million compared with the third quarter of 2015. The increase in the number of customers was the result of the interesting digital products and services relevant to the needs of customers in the use of digital services, data, phone, SMS, as well as VAS (Marketbisnis, 2016).

Along with the rapid growth of telecommunications in Indonesia, competition among the providers has also become more stringent. Therefore, companies also need to know the extent to which competitive level they are against the competitors in gaining market share, so it is necessary for them to have strategies to increase their market share. The provider focused strategies are customer based, coverage area, customer service, and price (Fachroeddin (2008) in Putro et al. (2009)). Of the four attributes, it will be analyzed which one becomes the dominant attribute accentuated by consumers in choosing a provider. This study will see the consumer views and considerations for the service providers that they choose. The basic of selecting the four attributes is according to Donoriyanto (2010) saying that the assumption of game theory is by the use of rules known by both parties competing with each other. The purposes of this study are to determine a way in finding out the optimal marketing strategy using a matrix game for

the providers of Telkomsel and Indosat and to determine the attribute which becomes the optimal strategy for each provider.

2. LITERATURE REVIEW

2.1 Decision Making Theory

Strategic decision-making can be defined as growing of importance for the characteristics of strategic decisions (Papadakis, 2006). Game theory is a tool used in the decision-making process that emphasizes the interaction analysis of all parties or players and focuses on the perspective of competitors to take the decision-making solutions (Kaplinski & Tamosaitiene, 2010).

According to Nachrowi & Usman (2004: 9), decision-making criteria can be selected using the criteria of maximin and minimax. Djati (2003: 137) explained that the maximin criterion is the decision taken in accordance with the action that maximizes the smallest gain. While the minimax criterion is the decision taken in accordance with the action that minimizes the biggest loss.

2.2 Game Theory in Telecom Industry

According to Dixit & Skeath (2009: 5), strategic thinking is basically an interaction with the other side, in which the other party is also doing a similar thing at the same time and in the same situation. In conducting business, company should consider the competitors' strategic thoughts, game theory is an analysis or knowledge concerning such interactive decision makings.

In game theory, player I is positioned as the player that will maximize gains, and player II as a logical consequence is positioned as the player that will minimize losses. Rationally, each player will react to select the most profitable strategy. If one chooses a profitable alternative strategy, then so does his opponent. In this case, the decision-makers know the strategies to be taken by the opponent, so does the possibility of the decision or the payoff values for each of the strategies to be taken. The decision-makers will act rationally to choose the best strategy by maximizing gains or minimizing losses (Siswanto 2007: 88). Some studies related to game theory in telecom industry, namely case study on Telkomsel Bankruptcy (Putra & Alamanda, 2017; Alamanda & Prasetio, 2014), case study on Conflict of Indosat (Alamanda et al., 2015a; 2015b; 2016).

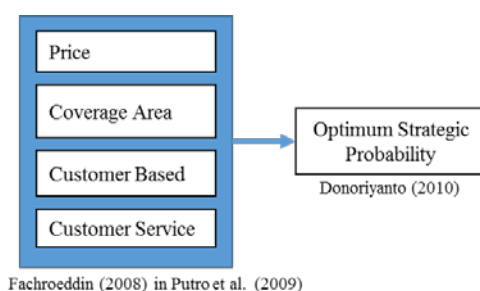
Based on the statement of Fachroeddin (2008) in Putro, et al. (2009) concerning the main attributes as the focus of the telecommunication companies are customer based, coverage area, Price, and Customer Service.

- a. Customer based is the number of consumers served by the company in which the consumers are buying and using the products of the company (Pinto & Rouhiainen 2001: 161). In this research, friends and family, the people around and the community are the indicators of the research.

- b. Coverage area is the service coverage area of the provider companies (Wardana & Makodian 2010: 17). The indicators used are the internet connection and the quality of telephone service.
- c. Price is the ability of goods or services if exchanged for cash (Tohar 2000: 22). The indicators used are the price of the internet package and the package price of SMS.
- d. Customer service is a meeting or series of meetings of transactions aimed at fulfilling the needs and expectations of the customers (Fogli 2006: 4). The total number of customer services is used as an indicator of the research.

In the study of Donoriyanto (2010), it is found that using matrix game theory will result in weighting the level of consumer interests against the considered attributes in selecting a product. Based on the result of game analysis, the most optimal attribute obtained is used as the product marketing strategy. Figure 1 is a description of research framework.

Figure 1. Research Framework



3. METHODOLOGY

This study uses a quantitative approach within descriptive type. In quantitative research, numbers and statistical methods are used which is prone to be based on numerical measurements of specific aspects of phenomena; it abstracts from certain example to find out general description or to verify causal hypotheses; it looks for measurements and analyses that other researchers can easily replicate (King, Keohane & Verba, 1994). Descriptive research comprises collecting and/ or analyzing data to reflect a group, concept, or phenomenon (Fitzpatrick & Kazer, 2012). Therewith, quantitative descriptive methodologies involve a number of aspects such as surveys, measurement tools, chart or record reviews, physiological measurements, meta-analyses, and secondary data analyses.

The questionnaires were distributed to 256 respondents consisting of 128 customers of Telkomsel and 128 customers of Indosat. The sampling method used is nonprobability sampling which is the convenience over a period of 3 months.

For the validity test, in addition to face validity, this study also tested the questionnaire using content validity ratio (CVR). Lawshe (1975) proposed the content validity ratio (CVR) is used to measure the degree of expert agreement from an item and that which

can express the validity level of the content through a single indicator that ranges from -1 to 1. Then, Lawshe (1975) also stated that each assessor or subject matter expert (SME) is for answering each question for each item with three options: (1) essential, and (2) not essential. CVR test results of five authors generated a value of 1 for all variables (customer based, price, customer service and coverage area) which means in accordance with the CVR minimum value requirement for the five panelists is at least 0.99.

Then, the trustworthiness test of research using the split-half and using instrument reliability coefficient standard according to the opinion of Guilford and Spearman Brown, both agreed that the reliability coefficient is > 0.60 (Bahri & Zamzam 2015: 58). The reliability calculation result of Spearman Brown split half technique is 0.778 for Telkomsel and 0.661 for Indosat.

The analysis technique used is the analysis of payoff matrix. In this study, the game will use two players zero sum game with the payoff matrix table of 2 players, namely Telkomsel and Indosat. According to Sivarethinamohan (2008: 343), the steps to perform the two person zero sum game is as follows:

- a. The game is played by two players. Assuming that both are rational players, and equal in intelligence;
- b. Choosing the strategy that will be selected for each player. Each player will have four strategies in which the positive value is the advantage for the row player and loss for the column player, and vice versa the negative value is the loss for the row player and benefit for the column player;
- c. Making a payout table. Payoff matrix demonstrates the advantages and disadvantages of one of the players. The way of forming the game matrix is for example the first player has m strategies and the second player has n strategies in order to obtain the payment matrix with the order $m \times n$;
- d. Determining the maximin and minimax criteria. The maximin rule involves selecting the alternative that maximises the minimum pay-off achievable while minimax rule involves selecting the alternatives that minimizes the maximum payoff available ;
- e. Identifying the value of the game and determining the optimum strategy for each player.

4. FINDING AND DISCUSSION

4.1 Respondents' Profile

The respondent profiles were divided into gender, age, place of residence, and income. Based on gender, for the customers of Telkomsel, 57,8% are women and 42,2% are men while the respondent profiles of Indosat customers, 50% are female and 50% are male. Based on the customer ages, the respondent profile of Telkomsel customers (10,2% under 18 years old, 65,6% aged 18-24 years old, 3,1% aged 25-30 years old and 21,1% aged over 30 years old); whereas the respondent profile of Indosat customers

(7,9% under 18 years old, 70,3% between the ages of 18-24 years old, 3,1% aged 25-30 years old and 18,7% aged over 30 years old).

Based on residence, the percentage of Telkomsel respondents who live in Jakarta is 27,9%, in West Java is 39,5%, in East Java is 3,9%, in Central Java is 4,7%, in East Kalimantan is 4,7%, in North Sumatra is 2,3% or three people, in South Sumatra is 2,3%, in South Sulawesi is 3,1%, in Bali is 8,5%, and the respondents who do not live in the abovementioned provinces are by 3,1%. While the percentage of Indosat respondents based on residence who live in Jakarta is 25%, in West Java is 30,5%, in East Java is 3,9%, in Central Java is 6,3%, in East Kalimantan is 7,4% , in North Sumatra is 9,4%, in South Sumatra is 4,7%, in South Sulawesi is 5,5%, and in Bali is 7%. Based on monthly income, the percentage of Telkomsel and Indosat respondents who have an income between IDR 1,000,000 - IDR 3,000,000 is 56,3% for Telkomsel and 60,9% for Indosat. Table 1 below shows on the profile of respondents based on gender, age, residence and monthly income.

Table 1. Respondents' Profile of Telkomsel and Indosat (in %)

Gender	<i>Male</i>		<i>Female</i>		
Telkomsel	57,8		42,2		
Indosat	50		50		
Age	<i>< 18 years old</i>	<i>18-24 years old</i>	<i>25-30 years old</i>	<i>>30 years old</i>	
Telkomsel	10,2	65,6	3,1	2,1	
Indosat	7,9	70,3	3,1	18,7	
Residence	<i>Java</i>	<i>Sumatra</i>	<i>Sulawesi</i>	<i>Bali</i>	<i>Others</i>
Telkomsel	76	4,6	3,1	8,5	7,8
Indosat	65,7	14,4	5,5	7	7,4
Monthly Income	<i><IDR 1 M</i>		<i>IDR 1-3 M</i>		<i>>3 M</i>
Telkomsel	21,8		56,3		21,8
Indosat	19,6		60,9		19,6

4,2 Payoff-Matrix Analysis

From the results of the survey has been done, the results of each variable: customer based (CB), coverage area (CA), price (P), and customer service (CS) is calculated using the following formula and the results are presented in Table 2. For example, there are 3 indicators in the variable of CB and there were 120 respondents who voted yes for indicator 1, 101 for indicator 2 and 32 for indicator 3. Therefore, the average is 84,34.

$$\frac{\sum \text{Yes Answer for each Indicator}}{\sum \text{Indicators}}$$

Table 2. Data of Variables

	Telkomsel	Indosat
CB	$\frac{120 + 101 + 32}{3} = 84,34$	$\frac{115 + 89 + 28}{3} = 77,34$
CA	$\frac{110 + 106}{2} = 108$	$\frac{90 + 97}{2} = 93,5$
P	$\frac{71 + 88}{2} = 79,5$	$\frac{102 + 103}{2} = 102,5$
CS	$\frac{120}{1} = 120$	$\frac{103}{1} = 103$

4.3 Telkomsel Payoff Matrix

In Table 3 Telkomsel is as the column player, while Indosat is the row player, so the formula for filling the matrix table of Telkomsel vs Indosat is as follows:

$$\frac{\sum \text{Yes Answer for Telkomsel} - \sum \text{Yes Answer for Indosat}}{\sum \text{Respondents}}$$

For example for cell₁₁ (row 1, column 1), the result is derived from the calculation:

$$\frac{84,33 - 77,34}{256} \times 100 = 2,73$$

Table 3. Payoff Matrix of Telkomsel versus Indosat

		Indosat			
		CB	CA	P	CS
Telkomsel	CB	2,73	-3,57	-7,09	-7,28
	CA	11,97	5,66	2,14	1,95
	P	0,82	-5,46	--8,98	-9,17
	CS	16,66	10,35	6,83	6,64

Based on Table 3, the minimax and maximin is obtained to find out the saddle point of payment matrix of Telkomsel vs Indosat as follows (Table 4):

Table 4. The Minimax and Maximin Matrix of Telkomsel versus Indosat

		Indosat				Minimax
		CB	CA	P	CS	
Telkomsel	CB	2,73	-3,57	-7,09	-7,28	-7,28
	CA	11,97	5,66	2,14	1,95	1,95
	P	0,82	-5,46	--8,98	-9,17	-9,17
	CS	16,66	10,35	6,83	6,64	6,64
	Maximin	16,66	10,35	6,83	6,64	

Table 4 shows that Telkomsel won the game using the attribute of customer service with the game value against Indosat is 6.64. Of the 192 respondents, 79.1% is aged 18-24 years and 20.9% aged over 24 years, by the gender, 56.3% is female and 43.7% is male, those who live in the province of West Java is 42, 8%, in Jakarta 30.2%, and the other 37% lives in the provinces of Central Java, East Java, and Bali. And the income of respondents below Rp. 1,000,000 is 5%, income above Rp. 1,000,000 to Rp. 3,000,000 is 71%, income above Rp. 3,000,000 to Rp. 5,000,000 is 4% and income over Rp.5.000.000. is 20%. So this game can be solved by using pure strategy in which each player has only one optimum strategy to be played.

4.4 Indosat Payoff Matrix

In Table 5 Indosat is as the column player, while Telkomsel is as the row player, so the formula for filling the matrix table of Telkomsel vs Indosat are as follows:

$$\frac{\sum \text{Yes Answer for Indosat} - \sum \text{Yes Answer for Telkomsel}}{\sum \text{Respondents}}$$

For example for cell₁₁ (row 1, column 1), the result is derived from the calculation:

$$\frac{77,34 - 84,33}{256} \times 100 = -2,73$$

Table 5. Payoff Matrix of Telkomsel versus Indosat

		Telkomsel			
		CB	CA	P	CS
Indosat	CB	-2,73	-11,97	-0,84	-16,66
	CA	3,57	-5,66	5,46	-10,35
	P	7,09	-2,14	8,98	-6,83
	CS	7,28	-1,95	9,17	-6,64

Based on Table 5, the minimax and maximin is obtained to find out the saddle point of payment matrix of Indosat vs Telkomsel as follows (Table 6). Table 6 shows that Indosat lost the game with the strategy of customer service against Telkomsel (-6.64).

Table 6. Minimax dan Maximin Matrix of Indosat Versus Telkomsel

		Telkomsel				Minimax
		CB	CA	P	CS	
Indosat	CB	-2,73	-11,97	-0,84	-16,66	-16,66
	CA	3,57	-5,66	5,46	-10,35	-10,35
	P	7,09	-2,14	8,98	-6,83	-6,83
	CS	7,28	-1,95	9,17	-6,64	-6,64
	Maximin	7,28	-1,95	9,17	-6,64	

4.5 Determining Marketing Strategy Using Game Theory

The competitiveness resulted from the use of Telkomsel customer service strategy is more superior compared with that of Indosat's. On December 13, 2015 Telkomsel introduced the latest display of My Telkomsel in which Telkomsel launched a feature called TelkomselCHAT. TelkomselCHAT is an online facility where the consumers can interact with Telkomsel's customer service through the application of MyTelkomsel for 24 hours each day. Additionally, Telkomsel has received many awards for its quality customer service, namely Achieving Exceptional Total Service Quality Satisfaction Service Quality Award 2015, Indonesia Golden Ring Award Best Customer Service in 2015, and Engage Award The Socially Devoted Company for Recognizing and Adapting to the Changing Nature of Customer care, 2015.

5. CONCLUSION AND RECOMMENDATION

The method of game theory used in this study is with two-person pure strategy zero sum game in which two players are involved in the game, winning or losing result is based on the saddle point specified by the minimax and maximin criteria of payment matrix. The research result shows that the most superior competitiveness of Telkomsel against Indosat is the customer service. On the other hand, Indosat does not have a strategy to surpass the competitiveness generated by its competitor, namely Telkomsel.

Telkomsel should maintain to use the strategy of customer service as its superior competitiveness in facing Indosat. With its achievement in maintaining the quality of customer service Telkomsel is expected to continue being able to outperform Indosat.

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