Can Game Theory Solve Marketing Problems?

Nur Syahira Mohamad Shari, Mohd Farid Shamsudin
Universiti Kuala Lumpur

Abstract: *Game theory has been used a long time ago in military strategy. In Marketing, game theory can be explained as persuasion element for the organization to consider about which the competitors will likely move and the impact for this movement towards their own strategy. The structure of game theory was constructed by Von Neumann and Morgenstern. There are vast debated by past researcher about possibility to apply this game theory to solve marketing problems. Marketing scholars claimed that game theory can be a tool to identify or predict competitive behavior. In the current marketing situation, issues such as pricing decision and identifying product to be sold can be explain and predict by using this game theory. Hence, it is important and highly recommended for marketing manager to understand the basis of game theory in decision making process.*

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About Game theory

Game theory can be concluded as the analysis of conflict and competitive situation using mathematical models (Garber & Phelps, 1997). This theory was introduced in 1950, by the mathematician by the name of John von Neumann and Oskar Morgastern. John at the same time is also expert in economy (Leonard, 2011). Basically, how the game is played is depends on the strategy that player plan before the games begins. Game theory also can be defined as the best decision making in presence of competitors with difference goals. The aim of this theory is to provide the systematic ways for business owner in decision making (Muthoo et al., 1996; Nisan, Roughgarden, Tardos, & Vazirani, 2007; Snidal, 1985).

Game theory helps settling he problem in many cases and achieve common results (Mohd Farid Shamsudin, Ali, Wahid, & Saidun, 2019). This theory can be applied on many fields such as marketplace decision, government cases, war, any science context, economics and also finance (Kadir & Shamsudin, 2019). In the marketplace, there are competition between two companies which compete for the competitive edge fighting over the market share (Sallaudin Hassan & Shamsudin, 2019). Game theory help business owner in developing market strategy such as pricing or any others decision (Gibbons, 2019; Kalai, 1991; von Neumann & Morgenstern, 2007; Yoshida, Dolan, & Friston, 2008). Game theory is also enable to help identify their rival's action and shows the best action to respond should the rivals surprise with unexpected movement. As a whole, game theory aims to find out the best strategy to solve the problem.

There is some assumption on game theory. First will be the complete information. Assume that all player include the competitors are known about the game structure and the business owner don't know about their competitor decision either in their product release, marketing strategy or pricing. Second, the rational in decision process (Greif & Greif, 2010;

Greif & Laitin, 2004; Jagannatham & Kumar, 2016; Loewenstein, 2000). Each player must be expert and rational. Market player have more choices to make decision and they can choose their own strategy to maximize their payoff. Thirdly, intelligence. Every player must be rational and able to predict their competitor's choice. Fourthly, interdependence. The results will be related to other player's decision. Next, is the time. The length of time taken will be affect the result. Lastly, the game theory tries to establish equilibrium between different player.

Game theory analyzed the behavior of player with rationality (Jagannatham & Kumar, 2016), and also analyze which player that the decision can be predicted and any deviation from the norm can be described (Kalai, 1991). Furthermore, marketing help to control customer behavior which is very irrational and can be change the effect differently. Hence, there is not possible to apply this game theory fully or as whole to marketing but it still can be used as a marketing strategy in mixed approach (Leyton-Brown & Shoham, 2008; Yoshida et al., 2008).

Besides, one of the example by using game theory on owner of the shoes sport wear shops. The aim customer is either footballer, runner or cyclist and there is important for them to identify which sport they involve with. Next, to provide them the most important content that useful for them. So, the first thing to do is send the email out maybe for this three targets customer which aimed at footballer, runner and the next is for cyclist. Let say the first email opens for the footballers, and the next email receive by the customer of this footballers is related to offer them the exclusive footballer content such as the article which giving them tips for the how to success with the soccer skills.

Marketers can put the communication to the further question such as how serious a footballer are they? Are they just starting out, or they make it as a hobby? This way will help marketers to send more specific content which aimed to help their customer to achieve their goals and faced the challenges (Jørgensen, 2018). Another important part is that they tell them how their service or goods can make them a better footballer.

The main important things of using this game theory in marketing is actually consumer not make the product choice by consider the cost and benefits (Muthoo et al., 1996), but they will think and choosing the product according to the emotional and the value of the goods. The statement is against logic and game theory. But as long as it can be rationalized, then game theory can be very useful (Leonard, 2016).

As conclusion, game theory can help to drive suitable response to the failure of the service. In customer satisfaction it helps in decision making such as customer service section that can immediately settle the customer complaint in order to increase the customer satisfaction (M. F. Shamsudin, Shabi, & Salem, 2018; Mohd Farid Shamsudin & Razali, 2015). There is some limitation on this game theory which that each firm has knowledge of others competitor's strategy and against their strategy. This is quite unrealistic assumption and low practicability. Actually, they only can guess their rival's strategy (Greif & Laitin, 2004; Jagannatham & Kumar, 2016; Loewenstein, 2000). Next, analysis stated that more than four persons in games can become complex and difficult. They said game theory not develop for games more than four players cause most economist problem related to many players (Greif & Greif, 2010). Marketplace which involve large number of buyer and sellers and game theory not provide any solutions. Even there is limitation on

this theory but it still helpful in providing the solution on some difficult economic problem in mathematical technique and still in development stages (von Neumann & Morgenstern, 2007).

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