The Social CRM Game

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Abstract

Customer service can now be delivered through social media channels (Social CRM) in addition to traditional closed channels like feedback forms (closed in the sense that the issues described are not made public). But there are benefits and costs to using social media as a channel for receiving complaints. We investigate how service providers might be able to use game theory to take a call on whether or not to offer customer service through Social CRM channels. We show that in the resulting games, there are cases where there is no unique Nash equilibrium. We also discuss the strategies in the context of a game of "Prisoner's Dilemma".

1 Introduction

Providers of cell phone services sometimes track what customers are saying about their brand on social media. Tools that support such monitoring and analytics might fall under the umbrella of Social CRM tools. The tracking of conversations pertinent to a brand allows the brand owner's customer service department to respond promptly to complaints from customers online and to resolve issues before they get more serious and cause some damage to the company's reputation.

2 Opposing Motivations

Complaints voiced on social media about a product might greatly affect a potential customer's decision to buy the product. So, brand owners have a clear incentives to respond to and resolve complaints on social media.

On closed channels like call centers or customer service email addresses since there is no danger of negative feedback being seen by and influencing another person's buying decisions.

So, social media gives users a greater bargaining power compared to traditional complaint channels. This gives brand owners one more incentive to resolve complaints - it is no longer just a question of a complainor's satisfaction, but also of an unknown potential buyer's impressions of the brand.

So, there is a clear incentive for firms to respond to customer complaints on social media channels.

However, a recognition of the greater bargaining power on social media combined with the greater ease of voicing a complaint on a social media channels might give users an incentive to choose social media channels instead of closed channels to voice negative sentiments.

So, if a service provider does not listen and respond to complaints voiced on social media, there might just be fewer expressions of negative sentiment on social media in the first place.

So, you can argue both for and against using social media channels to handle customer complaints. In this whitepaper we attempt to study the opposing motivations using game theory.

3 Game Theoretic Formulation

The situation described above could be described as a static game with complete information where there are two players, the aggrieved customer (Player 1) and the brand owner (Player 2). The strategies available to Player 1 (the customer) are a) to complain on social media and b) to complain through CRM channels. At the same time, the strategies available to Player 2 (the firm) are a) to resolve the issue and b) to ignore the complaint.

These strategies and the associated payoffs (an example of a payoff structure) are show in the normal form in Table 1. An explanation of the payoff structure is in order. The reward to Player 1 (customer) when Player 2 (firm) resolves an issue is the same no matter which channel was used to make the complaint.

	Resolve	Ignore
Social Channel	4, 3	$-2,-5$
Closed Channel	4,-2	$-2, 0$

Table 1: Normal Form - Example 1.

	Resolve	Ignore
Social Channel	4,-1	$-2,-5$
Closed Channel	4,-2	$-2, 0$

Table 2: Normal Form - Example 2.

	Resolve	Ignore
Social Channel	1,-4	$-2,-5$
Closed Channel	1,-9	$-2, 0$

Table 3: Normal Form - Example 3.

	Mum	Fink
Mum	$-1,-1$	$-9, 0$
Fink	$0, -9$	$-6,-6$

Table 4: P's Dilemma - Example 1.

However the reward to Player 2 differs based on which channel was used to make the complaint. If the closed channel is used, resolving the complaint could be costly (it might involve the firm absorbing the cost of making repairs or offering a refund or replacement) whereas ignoring the complaint might cost nothing provided the user does not quit as a result.

If the social media channel is used by player 1, ignoring a complaint becomes costly, since it could lead to many people thinking that the firm does not offer good quality. On the other hand, good customer service online could lead to many people believing that the company offers good quality.

4 Analysis

A quick inspection of Table 1 will convince the reader that there is no completely dominated strategy that can be eliminated. Moreover, there is no unique Nash equilibrium. For Player 1, both strategies have the same payoff (provided the player holds no beliefs about the other player's preference for a strategy).

In this example, one of the equilibrium points is better than the other for both players and so is the obvious choice. But this does not always have to be the case, as shown in Table 2.

In Table 2, you can see a variation of the example where there is no unique Nash equilibrium. This variation captures the case where the payoff to the firm of resolving the issue is not as high as the payoff to the firm of ignoring the issue provided the customer chose the CRM channel.

In this case, neither Nash equilibrium is better than or equal to the other for both players. So, in this case, we would need a different way of selecting a strategy or convention for the game. A useful tool in this case seems to be to use the social payoff instead of individual payoffs to identify the more preferable of the Nash equilibria.

The social payoff is computed as the sum of the payoffs for both players in the game (or in more general cases, for all players in the game). In Table 2, the preferrable Nash equilibrium has the social payoff value of $4 + -1 = 3$ as compared to the other equilibrium point's social payoff value of $-2 + 0 = -2$.

It must be noted that the social payoff is not the same as the payoff for a mixed strategy. In the latter case, you are computing the expected payoff for multiple strategies for the same player. In the former case, you are computing the total payoff for the strategies selected by different players.

Now, in Table 3, we present yet another variation of the problem. This is the case where the cost to the firm of resolving a problem might be extremely high but the benefit to the user not quite so high. In this case, the preferrable Nash equilibrium point would be different from the two preceding examples (since the social payoffs would be $1 + -4 = -3$ and $-2 + 0 = -2$ respectively).

5 Prisoner's Dilemma

In this section, we look at how social payoff measures result in the selection of strategies that are not Nash equilibria. For the purpose of this demonstration, we use the game of Prisoner's Dilemma (the normal form of which is given in Table 4).

There is a unique Nash equilibrium in this game and it is the strategy (Fink, Fink). However, if the players were (say) brothers and cared about each other. Or maybe the prisoners are both game theory researchers and knew the math. One plausible convention they might adopt is to select the strategy where both of them got the least number of years in jail in total. This would be the strat-

	Mum	Fink
Mum	$-4, -4$	$-7, 0$
Fink	$0, -7$	$-6, -6$

Table 5: P's Dilemma - Example 2.

egy with the highest social payoff, and it would be (Mum, Mum). The social payoff in this case would be $-1 + -1 = -2$ whereas the payoff in the case of the Nash equilibrium would be $-6 + -6 = -12$.

An interesting variation of the problem is presented in Table 5.

The penalties still follow the conventions typically used for prisoner's dilemma. The sucker payoff is lower than the punishment which is lower than the reward which is lower than the temptation. However, in this case, the best social payoff comes from one person taking the Mum strategy and the other person taking the Fink strategy.

6 Possibilities

It is possible that the use of social media for customer service might benefit from an understanding of the game theoretic motivations underlying customers' and firms' choices.

It is possible that game theory might benefit from a study of customers' and firms' choices in using social media for customer service.

The Prisoners Dilemma games studied herein also suggest that social payoff equilibria offer interesting alternatives to the Nash equilibrium.

7 Caveats

Social payoffs can select strategies that are not Nash equilibria and therefore are not a tighter criterion of selection than the Nash equilibrium.

From the perspective of Prisoner's Dilemma, since the Nash equilibrium is not among the strategies selected by the social payoff maximization approach, does that make social payoffs irrational and indefensible from the point of view of game theory?

Do considerations of social payoffs ever enter our lives? Do we only use considerations of individual payoffs in all our decisions?

Since we are new-comers to the field of game theory, we don't know if social payoffs have already been studied extensively but just under another name.