Game Analysis of Google's Information Dissemination Strategy in China

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Abstract: This paper addresses the issues that arise when corporations are required to make strategic choices regarding operation in foreign countries with diverse socio-political systems and culture, while taking into consideration all the relevant stakeholders, which ultimately affects the corporations' current and future payoffs. Using the game theory principles we focus on Google's internet search operations in China, particularly information dissemination decisions, and we examine how Google's decisions affect the corporation's success on the Chinese market, which is additionally determined by the information regulation policy of the Chinese authorities. In view of the fact that goals of Google and Chinese authorities are partially overlapping and partially conflicting this perfect information game contains both competitive and cooperative elements. In this paper we will argue that for Google or any other company in the equal situation the best strategic choice would be to respect and follow the laws and restrictions set by the authorities of the country in which the company chooses to operate. Finally, an analysis is completed through determining the optimal strategy for Google and Chinese authorities and finding the equilibrium point.
Key words: China; Game theory; Google; Information dissemination

1 Introduction

According to Milton Friedman primary goal of any profit organization is to maximize its profits [1], accordingly improving their market performance which will ultimately result in the growth of the corporation. This concept is primarily beneficial for the corporation's shareholders. Conversely shareholders are not the only party affected by the decisions a corporation makes. While conducting business operations the modern enterprise considers the entire spectrum of its stakeholders, applying a strategy that will create value for the customer, the investor and satisfy any person or organization that has a vested interest in the corporation and the way the enterprise conducts its business. Claus Ott identifies stakeholders as "the employees of the firm and all types of external participants including suppliers, consumers, and other clients as well as creditors and eventually society at large and the state" and points out that "corporations, from the point of view of Corporate Social Responsibility are no longer merely profit maximizing institutions, but rather they are institutions to coordinate and balance interests of share-holders and of stakeholders [2]." In many cases CSR is viewed as an "instrument to increase profitability rather than a fundamental goal in itself [3]." We can infer that corporations' goal of maximizing profits will depend on the ability to establish good relationships with the most relevant stakeholders while following the principles of CSR. However, not all stakeholders share the equal goals and have matching interests. Additionally, in situations of conflicted interests of stakeholders and the differing perception on what might be corporate socially responsible behavior that balance is difficult to find. Choosing a particular set of actions the top management of the corporation considers being the supreme option should enable the enterprise to attain the competitive advantage considered necessary in today's global market competition. The chosen strategy should correspond with the interests of the most relevant stakeholder, given that corporation's market performance decidedly depends on the nature of that relationship. Choosing the wrong strategy can result in corporations passing up an opportunity of attaining competitive advantage that is absolutely essential to compete successfully on the global market.

With the emergence of corporations operating in relatively new globally accessible industries such as internet, in countries with culturally, legally, politically, socially and economically differing characteristics they are bound to come across various obstacles on their path to the profits. Yang acknowledges the distinctiveness of the Chinese Internet culture which "consists of new cultural forms that emerge out of the interaction between Internet and society and that are the products of both cultural tradition and innovation [4]." Taking into consideration that China is a developing country and the scale of social and economic changes its nation is experiencing it is imperative for those changes to be managed effectively, especially when dealing with a relatively new and unregulated media, such as Internet, primarily the search engines which present an enormous hubs of information, hence being a

threat to the health of a developing nation if not managed properly. In addition, it is essential for any corporation to be aware of all differences, respect and abide by them in order to operate without restraint on the foreign markets. The efforts of Google and China to co-operate have failed essentially as the result of Google's reluctance on following through with the commitment of respecting local differences, in consequence abandoning the policy of self-censorship, which ultimately led to the Google's pull out from the Chinese market.

The ''Google's situation in China'' section provides an abstract of the central events which led to Google's current condition in China. Succeeding sections exhibit the application of the Game Theory principles and discuss their limitations and implications for Google's operations on the Chinese market and relationship with the Chinese authorities.

2 Google's Situation in China

Before establishing operations in China Google.com was accessible around 90 % of the time, all due to the content and the service not being in compliance with the laws and regulations of People's Republic of China [5].

Google had an imperative decision to make. The corporation had a choice between continuing the operation of its website from the United States of America, thus providing Chinese internet users a poor quality and slow service regulated by the Chinese authorities, and entering the Chinese market where the company would have more control over the way it manages its business. Eventually, in 2006 Google signed the "Public Pledge on the Self discipline for the Chinese Internet industry", an agreement which is required to be signed by the all internet companies who are about to do business in China [6].Google established their presence on the Chinese mainland by opening their R&D center, announcing its intent to comply with Internet information dissemination laws and introducing China based Google.cn. These actions undertaken were divergent to the Google's core principle.　According to Google's mission there are two fundamental commitments: firstly, to please the interests of users and by doing so build a leading company in their industry; secondly, to make world a more informed and liberal place by expanding access to the information [7]. However, a secure Chinese government is trying to guarantee stability and sustainable growth by managing the flow of information. As a relatively new and still inadequately regulated media, Internet hasn't been subjected globally to the same information dissemination laws and regulations as TV, radio, newspapers and books. Taking into consideration that Internet has a more powerful political impact in China than in other countries [8] spreading harmful information can cause riots and jeopardize the overall safety of the nation which makes Internet regulation justifiable [9]. It might also be argued that this represents the rationale of any Internet company aspiring to operate in China consequently leading to the acceptance of local laws of the country chosen to operate in. Following the same principle and in order to enter China Google has added a third commitment to its mission: "Be responsive to local conditions [7]."Consequentially to the self censorship policy it was conducting Google was a subject of criticism from the USA Congressional Committee and world media.　Nevertheless, the company argued that it is contributing more to the increase of free flow of information by participating in China's Internet industry than by refusing to abide by the rules and regulations of the Chinese authorities and being denied entrance to the mainland Chinese market. "While removing search results is inconsistent with Google's mission, providing no information (or a heavily degraded user experience that amounts to no information) is more inconsistent with our mission," a statement said [10]. During a four year period Google worked together with the Chinese government to censor online information available to the Chinese public, as a consequence earning profits and strengthening its position in China.　In 2010, Chinese authorities enhanced their control of the Internet therefore further improving the network and information security conditions in the country. 2010. Statistical Report on Internet Development in China states that "Chinese government was actively involved in construction of laws and regulations, technical standards, infrastructure as well as network security system, etc; continuously enhanced the construction of network and information safety management platform; intensified control and monitoring on communication networks as well as prevention and checking on phishing sites, illegal websites and bad information, especially active control on mobile media and technical service websites; and perfected filing of domain name registration information[11]." Continuous enhancement of internet control was not perceived positively by Google and its leaders, and on January 12, 2010 Google declared that it is no longer willing to comply with the Internet information dissemination laws and regulations in mainland China. The company made a resolution not to censor their search results on Google.cn and decided it will look into

"the basis on which Google could run an unfiltered search engine within the law, if at all. We recognize that this may well mean having to shut down Google.cn, and potentially our offices in China [12]." After the resolution Google temporarily discontinued its result filtering, only to restore it later without any explanation. On March 23 2010 Google started redirecting its Google.cn internet users to Google.com.hk. In this way Google provided an uncensored service by evading the Chinese control [13]. This decision by Google caused the Chinese authorities to block the access to all Google search sites. Some other Google services remained unaffected. This ban was lifted one day later. On June 30, 2010, in order not to get their Internet Content Provider license revoked, Google stopped redirecting the Google China internet users to the Hong Kong domain and positioned a link to Google Hong Kong. Google's decision caused Chinese mobile operators; China Unicom and China Mobile to terminate their contract with Google consequently costing Google an opportunity to serve a huge mobile phone market. Google's future regarding China remains uncertain. According to the figures from CNNIC, by December 2010, there were 457 million Chinese internet users, out of which the number of users for search engine amounts to 375 million which represents an increase of 93.19 million compared with the end of 2009. According to the projections the number should increase to 900 million by the year 2013 [11]. It can be derived that the overall growth in the number of internet users and the increased popularity of internet, particularly the search engine which has became the application with the largest internet users [11] make China a market of strategic opportunity, both in the medium and long run.

3 Constructing　a Game Model

　　We can define this game as a two player game, with Google and Chinese authorities as players. Chinese Internet users, who react predictably to the changes in the flow of the information without trying to affect the actions of Google or Chinese authorities, are not considered to be players, just an environmental parameter that affects weights and coefficients of payoff matrix. Google's current and potential competitors on the Chinese search engine market aren't included in the game in order not to overly complicate the model, but their effect on payoff matrices of Google and Chinese authorities respectively is considered and accounted for.

　　Each of the players has a goal to maximize his payoff by choosing an optimal action from the set of available actions. Google's payoff is influenced by the factors laid out in its mission statement: providing the service in China in accordance to its global commitment on one hand and completeness of the service provided (i.e. freedom of information) on another. Chinese authorities' goals are national stability and control of information as its prerequisite on one side and resource exchange with Google with Google's participation on Chinese market as a prerequisite on another. For the purpose of this game, we make the assumption that each player is rational and that each player is aware about the rationality of the opponent. The game in question is a game with perfect information – consequences of the choices for each player are known in advance. The game contains both competitive and cooperative elements, since goals of Google and Chinese authorities are partially overlapping and partially conflicting.

1.1 Possible actions

　　Google has a choice whether to filter its search results in compliance with Chinese laws or not, thus in the short term following its mission statement to the letter, but with different long term consequences.
G_m = {filter search results, don't filter search results}

　　Chinese authorities can allow or block access to Google's services, in order to maintain its interests of information control and political stability.
C_m = {allow access to Google, block access to Google}

3.1 Order of movement

　　We will assume that this is a strategic game, i.e. that each player has no more than a single move available, reflecting the fact that strategic changes by one player would negatively affect the political will of another player to cooperate with the first player. Google moves first, making a strategic decision whether restrict its search results or not. Chinese authorities, being in the position of power, respond to the move made by Google.

3.2 Payoff matrix construction

3.2.1 Payoff matrix for Google

　　Primary goal of Google's operation in China is providing a quality service in mainland China. Secondary goal of Google is promoting the freedom of information. The first goal is by its nature directly related to profit and also represents a necessary prerequisite for the fulfillment of the second goal. Hence the importance of the first goal is necessarily higher than the importance of the second goal,

with the difference in importance expressed by the positive constant α. Constant α can vary to reflect the presence of Google's competitors on Chinese market.

$$wg_1 = \alpha + wg_2 \text{ - the importance of providing service in China} \tag{1}$$

wg_2 - the importance of enabling the free flow of information

All weights and coefficients are positive.

Payoff matrix for Google has the following elements:

a_{11}: payoff in case Google doesn't filter its pages and Chinese authorities allow access to Google
a_{12}: payoff in case Google doesn't filter its pages and Chinese authorities block access to Google
a_{21}: payoff in case Google filters its pages and Chinese authorities allow access to Google
a_{22}: payoff in case Google filters its pages and Chinese authorities block access to Google anyway

Using the weights wg_1 and wg_2, we calculate:

The resulting payoff matrix for Google is:

$$G = \begin{bmatrix} \alpha + 2wg_2 & -(\alpha + 2wg_2) \\ \alpha & -(\alpha + 2wg_2) \end{bmatrix}$$

3.2.2 Payoff matrix for the Chinese authorities

In its dealings with Google, Chinese authorities have two goals. The first goal is controlling the flow of information provided by Google's services, in order to maintain political stability. Another is a mutually beneficial business relationship with Google, with additional positive effect on public opinion in foreign countries. Currently, Chinese authorities prioritize the information flow control, reflected in the value of a positive constant β.

The weights are:

$$wch_1 = \beta + wch_2 \quad \text{- importance of controlling the information flow} \tag{2}$$

wch_2 - importance of maintaining a business relationship with Google

All weights and coefficients are positive. Payoff matrix for the Chinese authorities has the same layout as the one for Google, but different coefficient values.

$$C = \begin{bmatrix} -\beta & \beta \\ \beta + 2wch_2 & \beta \end{bmatrix}$$

3.2.3 Final payoff bimatrix for the game

Since goals of Google and Chinese authorities in this game are partially conflicting and partially overlapping, the game has elements of cooperation. It is described by a payoff bimatrix, which consists of ordered pairs formed from respective payoff matrices for Google and Chinese authorities.

$$M = \begin{bmatrix} (\alpha + 2wg_2, & -\beta) & (-(\alpha + 2wg_2), & \beta) \\ (\alpha & \beta + 2wch_2,) & (-(\alpha + 2wg_2), & \beta) \end{bmatrix}$$

Google moves by choosing a row, first row corresponding to filtering its pages, second row corresponding to ceasing to filter its pages. Chinese authorities moves by choosing a column, first column corresponding to allowing the access to Google's pages, second column corresponding to blocking the access to Google's services.

Google, since it moves first, has only two strategies available: to filter its pages or not to filter its pages.

SG = {Filtering, no filtering}

Chinese authorities, since they move second, have a number of strategies available:

$$SC = \begin{cases} Always \ \ allow \ \ access \ \ to \ \ Google \\ Always \ \ block \ \ access \ \ to \ \ Google \\ Allow \ \ access \ \ to \ \ Google \ \ if \ \ it \ \ filters \ \ its \ \ pages \ , block \ \ otherwise \\ Block \ \ access \ \ to \ \ Google \ \ if \ \ it \ \ filters \ \ its \ \ pages \ , allow \ \ otherwise \end{cases}$$

The last strategy is strongly dominated by other strategies, so we can discount it at the beginning.

4 Determining the Optimal Strategy and Equilibrium Point

Our goal is to determine the optimal strategy for Google (if one exists), i.e. whether Google should filter its pages or not. In order to determine the optimal strategy, we construct the minimax tree representing the possible choices for both players, and analyze the consequences of players' choices, starting from the bottom up. Google moves first. Therefore its choice is placed at the root of the tree, with left branch representing the choices not to filter its pages and the right branches representing the choice to filter its branches. Nodes at the second, final level (Chinese authorities, in the position of authority, has the final word) represent subsequent decision by Chinese authorities, whether to allow access to Google's pages (left branch) or block access to Google's pages (right branch). At each stage, a player will make a decision that will maximize its utility, given that the opponent will follow-up with a rational decision that will maximize its own utility. If Google chooses not to filter its pages (taking the left branch from the node), Chinese authorities decide between allowing the access to Google, resulting in the utility of -β for Chinese authorities, and blocking the access to Google, resulting in the utility of β for Chinese authorities. Therefore, in case Google chooses not to filter its pages, Chinese authorities will choose to block Google, resulting in a negative payoff $-(\alpha + 2wg_2)$ for Google and positive payoff β for Chinese authorities. If Google chooses to filter its pages, Chinese authorities have a choice between allowing access to Google, resulting in maximum payoff $\beta + 2wch_2$ for Chinese authorities, or blocking it, resulting in payoff β for Chinese authorities. Therefore, Chinese authorities will choose to allow access to Google, and the final payoff of this sequence of moves for Google would be α. Consequently, at the beginning of the game Google chooses between no filtering, with the payoff of $-(\alpha + 2wg_2)$ for Google and filtering, with the final payoff of α for Google. Therefore, Google will choose filtering. Hence, at the present the optimal strategy for Google is to filter its pages. Optimal strategy for Chinese authorities is to allow access to Google if Google filters its pages and block access to Google otherwise. No player has incentive to deviate from this strategy, given that no other players deviate, as deviation would result in a decrease of payoff. The expected payoff of the game is $(\alpha, \beta + 2wch_2)$ representing the fact that Google operates in China, providing services, but doesn't provide unrestricted information to users and the fact that Chinese authorities maintain both control of information and a sound business relationship with Google. It is a hope of Google in choosing the current best move that through the passage of time and its cooperation with China it will be able to reduce the factor β to a smaller and eventually negative value, so that in the future requests for filtering will diminish and eventually free flow of information would be achieved.
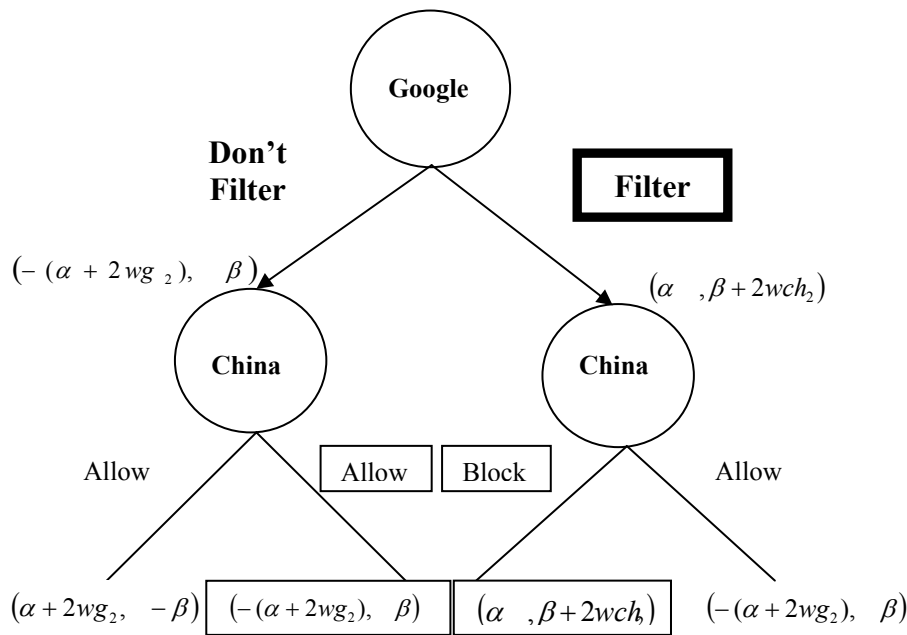

Figure 1   Google and Chinese Authorities' Decision Tree

5 Conclusion

According to the analysis of Google's information dissemination strategy in China, which was conducted by applying the principles of game theory, we can conclude that given the current circumstances Google's optimal strategy is to filter its pages, therefore being in compliance with the rules and regulations of People's Republic of China. The Chinese authorities' optimal strategy is to allow access to Google if Google filters its pages and block access to Google otherwise. In the situation where Chinese authorities, or any country's authorities for that matter, are the principal stakeholder alternative strategy would result in a decrease of payoffs. However, the situation might be changed if staying in China wouldn't correspond with Google's higher profit or if decision to move its servers from mainland China will affect the willingness of China's authorities to conduct business with Google, forming partnerships with Google's competition which may affect weights and the optimal strategy of both parties. This game theory analyses presents an innovative approach in determining an adequate strategy in a cross-cultural environment in which local authorities and different international corporations are the key participants. Given the increase in the international business activity and the conflicts that arise in between the participants there are different models introduced in order to ensure that the right business strategy is chosen by each party. With our model we attempt to provide an innovative way of selecting a strategy for a corporation when facing the laws specific to the country where it is doing business in and provide a basis for the further development of the new approaches.

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