

Hotel Viral Marketing via Social Networks: A Strategic Pricing Lesson from Group Buying

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ABSTRACT

Viral marketing is the business approach that uses peer-to-peer communications to increase product awareness and adoptions through widespread social networks of receivers. Benefiting from the unprecedented fast growth of online social networks, this marketing maneuver merits a deeper understanding in how to promote from receivers' intention to their actual purchases. A strategic pricing lesson from the recent group buying trend was applied to a hotel booking situation. By identifying and testing three pre-determined discount-network pricing schedules in a simulated hotel booking website, the authors observed booking revenue performance. It was found that the price scheme with steepest slope achieves both the smallest booking volume and the lowest revenue within the study period. Theoretical and practical implications were also provided.

Keywords: *group buying; viral marketing; social networks; group discount; hotel industry.*

INTRODUCTION

Group buying has recently gained great popularity in the online merchandise world. Basically, the merchant offers a certain product at a deeply discounted price, but requires buyers to form a buying group large enough to “achieve” the price. If in a pre-decided time frame (e.g., one day on groupon.com), buyers succeed to form such a group, then everyone in the buying group will receive the product at the same discounted price. However, if the number of buyers doesn't reach the required level, then no one gets the deal. This direct network effect (i.e., individual customer's value depends directly on the number of adopters from the group) has attracted much attention from both industry practice (e.g., groupon.com) and academic research (e.g., Ito, Ochi, & Shintani, 2002). Especially in the hotel industry where price discounting is a common practice and managers are eager to expand the customer base, a further investigation is needed in understanding and utilizing this group buying business model.

Hotel industry is not strange to group sales where hotels and companies often negotiate corporate and group rates to lower the risk of both parties. The bargaining power of both parties collectively determines the final uniformed discount. In such cases, In contrast, many of the recent group buying practice has shared similar characteristics where a seller pre-decides the discount and expects buyers to explore their power to achieve the potential lowered price. In such scenario, the internal group dynamics may vary based on whether the buyers are connected socially (i.e., acquaintances) or simply strangers. Since marketers today are more empowered to obtain customers' social networking information from online channels, the authors believe that utilizing the recent group buying practice with special attention on customers' social network dynamics may yield interesting implications for hotel industry to develop new business models.

Moreover, the seasonal and perishable nature of hotel inventory has limited hotels' ability in pricing management. Since a room unsold is a revenue lost forever, hotel managers are eager to sell their inventory as soon as possible. Discounting is a common strategy to limit the possible loss of unsold rooms. In addition, hotels also rely heavily on third parties such as travel agencies to distribute part of their inventory ahead of time with a significant discount. Although multiple distribution channels can benefit hotel companies in selling the products fast, the increasing power of online distribution channels also makes it difficult for hotels to control their inventory as well as prices (Enz, 2003). The conflict between benefit and loss of partnership with their third parties has urged hotel managers to find complementary marketing strategies to attract customers directly with better control in room pricing without the help from third parties.

The group buying strategy employed in many recent business models pays little attention on how such discount can be achieved by customers. In contrast, viral marketing strategy which uses peer-to-peer communications to increase product awareness and adoptions through widespread social networks of receivers is more focused on how users are connected through various channels. In addition, groups buying uses potential discounted product to attract buyers, while viral marketing uses intriguing messages with positive outcome within the social networks of the users to achieve the same goal. Thus, the authors proposed a network discount serving as the stimulus for both viral marketing process and the group buying outcome. This network discount refers to the potential total discount all buyers will get if they can form a buying group large enough. Because of the network effect, it is expected that user with this information will not only share with his or her friends as potential buyers in social networks but also encourage them to join the buying network to maximize the benefit. Following the viral marketing paths, the friends of initial users will also recommend this discount to their friends, creating a multi-tier network. Hence, the authors further suggested a dynamic pricing schedule which specifies a network discount scheme based on different network sizes.

The applications of viral marketing and group buying scheme received further attention with the proliferation of online social networks such as Facebook and MySpace. Thus, in the presence of easier and faster group coalition process brought by social networks, how to develop this new marketing opportunity into a feasible complementary strategy for hotels is the major research question of this study. However, how to derive a dynamic pricing schedule which can capture customers' social network effect is a complicated task. Many researchers applied mathematical approach to determine an optimal structure (Burnetas & Smith, 2000; Nahmias, 1994; Wang & Wu, 2000). The common difficulty lies in approximating customer demand distributions under different pricing schedules. Especially in the social networking environment, the typical approximation methods such as stochastic approximation (Burnetas & Smith, 2000) and normal distribution (Nahmias, 1994) may not be suitable for describing the network behavior within the social groups. Thus, the authors took an experimental design approach, identified three typical price-network size schedules based on the degree of prices reduction as network group size increase, and tested the schedules in a simulated hotel reservation scenario.

By understanding the mechanism of incorporating viral marketing in promoting group buying in hotel industry, this study achieved two contributions. First, this study indicated a complementary marketing approach which may deliver a profitable model by directly attracting large base of customers through their social networks. This implication is especially valuable for hotel industry considering their need to graduate shrink their dependence on third-party distributions. An incremental discount based on buying network group size is suggested as one effective incentive in this process. Secondly, this paper also analyzed what types of incremental discount schedule may deliver desired performance in achieving higher revenue and number of customers in less time.

LITERATURE REVIEW

Group buying pricing

The practice of using discounts as a means to influence buyers' purchase behaviors has been studied by many researchers. Goyal and Giri (2001) showed that temporary price reductions can increase consumer demand and sales in the market. Group sale is one such practice that focuses on increasing sale volume to compensate the discounted price. In the online auction business, there may be different buying patterns depending on whether the discounted price is posted in advance or negotiated by a group leader. The former pattern is used by *groupon.com* and other group sale websites alike. Some online auction site such as *mobshop.com* applied a dynamic price schedule where final price could vary based on the group size (Kauffman & Wang, 2001). The latter pattern is mostly found in the Chinese term "Tuangou" phenomenon where a certain buyer (a leader) will aggregate a group of buyers and negotiate the price with the seller on the buying group's behalf. Considering the current business-to-customer environment in hotel industry, the first pattern which the seller pre-decides the discount and expects buyers to achieve the lowered price is applied through the study.

Wang and Wu (2000) contended that a buyer is more willing to accept a larger order quantity for a higher discount when there is a larger potential benefit. In a group buying scenario, it is believed that a potential buyer is willing to make effort to increase the buying group size to increase the likelihood of getting a lower price. Thus, in addition with viral marketing process, it is believed that users will increasingly use their social network connections to further enlarge the buying group and achieve the network effect for everyone in the purchase group.

Viral marketing

Online environment has increased marketers' ability to influence customers' choices and communicate promotion messages to a larger number of potential customers rapidly (Dholakia & Bagozzi, 2001). The fast growth of Web 2.0 technologies has changed the marketing landscape and online social networking is one of the primary activities empowered by the continuous advancements in information technology (Kasavana, Nusair, & Teodosic, 2010). One significant example is the amplified viral marketing campaigns. According to Bampo, Ewing, Mather, Stewart, and Wallace (2008), viral marketing is the marketing strategy that increases product awareness and adoptions as well as company brand recognition by spreading out a persuasive viral message through receivers' social networks by word-of-mouth.

Researchers have identified several advantages of viral marketing over traditional mass media (Bampo, et al., 2008; Ferguson, 2008; Subramani & Rajagopalan, 2003). For example, since in viral marketing where users are socially connected, message senders tend to have knowledge to select receivers with possible desired reactions to the message (Bampo, et al., 2008). In addition, because of the extra effort for the receivers to send the intriguing viral message to another contact is marginal, they are able to easily send out the message to multiple members in their social networks. Therefore, viral marketing can enable companies to reach customers on a larger scale, including customers that they would not be able to reach otherwise before (Subramani & Rajagopalan, 2003). Further, a behavioral response to a viral message is potentially more quantifiable than in other mass communication forms because of the exponential growth (Bampo, et al., 2008).

A strong force is needed to encourage message senders and receivers to make purchase decisions. Especially in the online environment where price sensitivity are dampened because of the in-depth price information provided by online media, it is natural for marketers to employ pricing strategy to capture customers' attention (Shankar, Rangaswamy, & Pusateri, 1999). Arthur, Motwani, Sharma, and Xu (2009)

argued that an effective pricing strategy for viral marketing should serve not only as the motivation for customers to purchase the product but also as the stimulator for customers to spread the message to their friends. Thus, the incremental discount strategy utilized by mobshop.com which captures different group buyers is suggested as the possible stimulus to attract customers and promote purchase decisions. According to Nunes and Drèze (2006), when people perceived themselves as in a process towards a goal, they will exhibit greater persistence towards reaching the goal. This endowed progress effect also supports the rationale to impose a better reward at the end of the progress. Also, providing incremental reward can further capture the different budget constraints existing in different purchase groups. Thus, by setting up an incremental discount strategy based on the purchase group size, it is believed that users will exert more effort to achieve this reward, i.e., the lowered price for everyone in the buying group.

Direct marketing in hotel industry

Managers in different markets often need to sell their products with a discount when the products are perishable and need to be sold before a deadline (Sezen, 2004). In the hotel industry, the perishable and seasonal nature of hotel rooms prompts hoteliers to maximize their revenue by incorporating different distribution channels (Tso & Law, 2005). However, the increased use of third parties as additional distribution channels also brought hotels with control issues over room prices and inventory management (Enz, 2003). In order to gain back control and attract more customers directly, hotel industry needs not only advertising and loyalty programs but also complementary methods to initiating large quantity of sales from potential customers directly.

Group buying is common in hotel industry as a complementary way to secure sales. Besides negotiating with companies for business travelers, leisure customers can also travel in groups, such as a Spring Break trip for college students or class reunions. In such cases, the number of customers who end up buying may vary depending on the price determined by the hotels. If the hotel can provide a group buying strategy which offers a dynamic discount based on group sizes, then maybe more customers will be attracted because they have the incentive to achieve a lower room price as well as some flexibility to select a discount that suits themselves.

Such situation has provided an ideal context to promote group buying through viral marketing and to examine performance of different price-network schedules. First, discounting strategy is widely adopted in hotel industry, especially for the less-understood incremental discount which offers higher discount to larger groups. Secondly, many hotel customers are used to find the best room rate over the Web so that they reduce uncertainty about the products that sold with discounts (Chen & Schwartz, 2008). Thirdly, other studies also indicated that hotel industry is particular suitable for implementing word-of-mouth based marketing strategies because of its intangible and perishable natures (Litvin, Goldsmith, & Pan, 2008; Tso & Law, 2005).

Approximating a reasonable demand distribution to determine a reasonable price-network size schedule is difficult because of the unknown social connections among group members. Thus, following the normal trade laws where larger discounts are provided for larger order quantity (Wang & Wu, 2000), three price-network size schedules were pre-determined in this study. The difference among the three schedules is the degree of price reduction according to the size increase of the buying group. S1 offers the lowest degree and S3 offers the highest degree among the three schedules. Under these three schedules, participants needed to achieve their minimum required group sizes NS_3 , NS_2 and NS_1 where ($NS_3 < NS_2 < NS_1$) for receiving the same price P^* as shown in Figure 1.

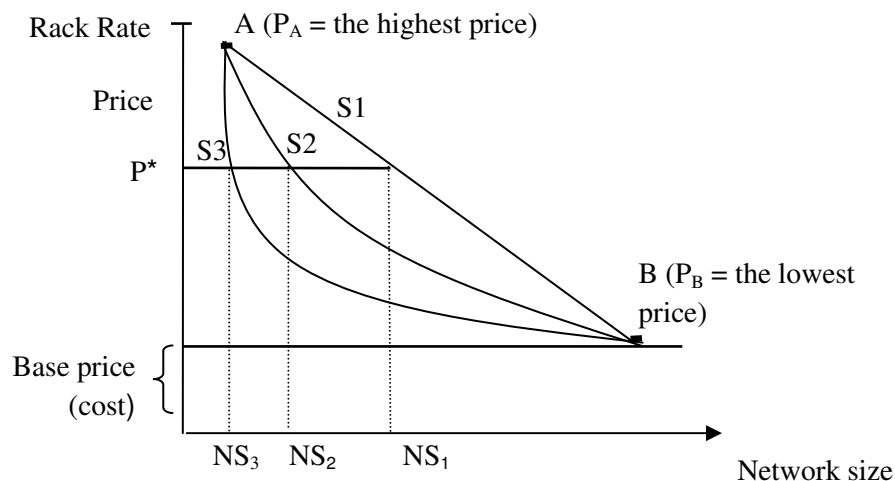


Figure 1
Illustration of Three Different Price-Network Size Schedules

EXPERIMENTAL DESIGN

For each schedule, the authors collected total revenue, number of bookings, and the time needed to reach a sold-out as the proxies for evaluating the effectiveness of the three typical price-group size schedules. Such measurements were suggested by previous studies in investigating the effectiveness of viral marketing (Ferguson, 2008; Hartline, Mirrokni, & Sundararajan, 2008; Kempe, Kleinberg, & Tardos, 2003). Since hotel inventory is limited in a certain time frame, time was also treated as a measurement to show the performance of different schedules. These measurements also helped managers contemplate for different marketing concerns such as time, customer base, or revenue.

Hence, a simulated hotel reservation website (as shown in Figure 2) was built based on a leisure hotel located in Florida. The high travel season of late October was set as the time frame. Participants were asked to make a 3-consecutive day reservation on the Website with a unique promotion code (randomly assigned) identifying the schedule group. They were noted with predetermined price schedule information indicating a possible lower room rate for everyone if the group size gets larger during reservation process (see Figure 3). In addition, they were also encouraged to identify and persuade their friends to join the buying network (different reservations were acceptable) through their social networks by Emails. A short survey was presented at the end of the reservation to capture the social connection information among the members of the buying group. An illustration of the experimental procedure is provided in Figure 4.

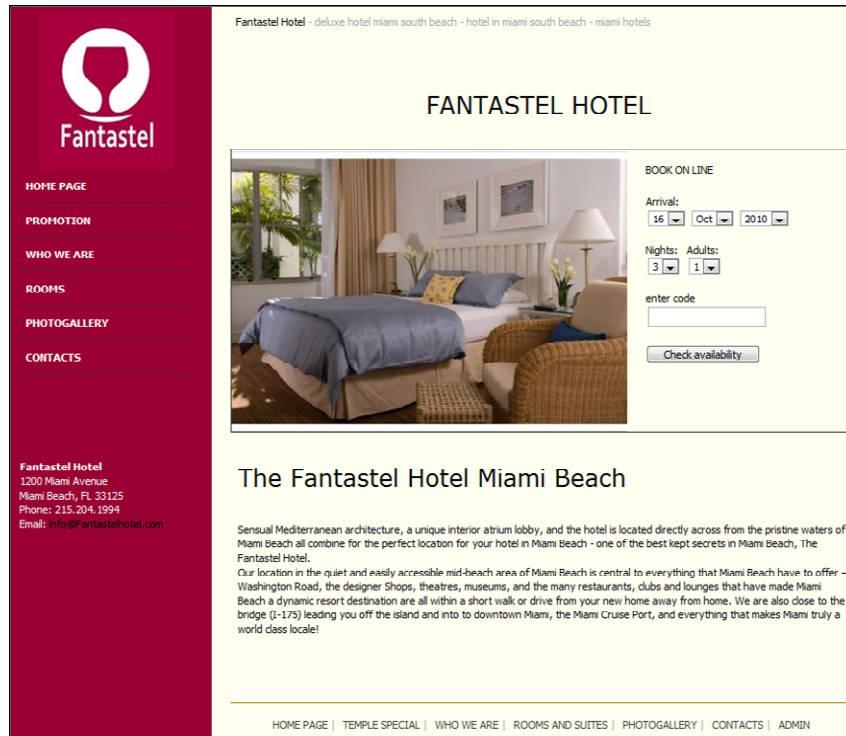


Figure 2
The Simulated Hotel Reservation Website

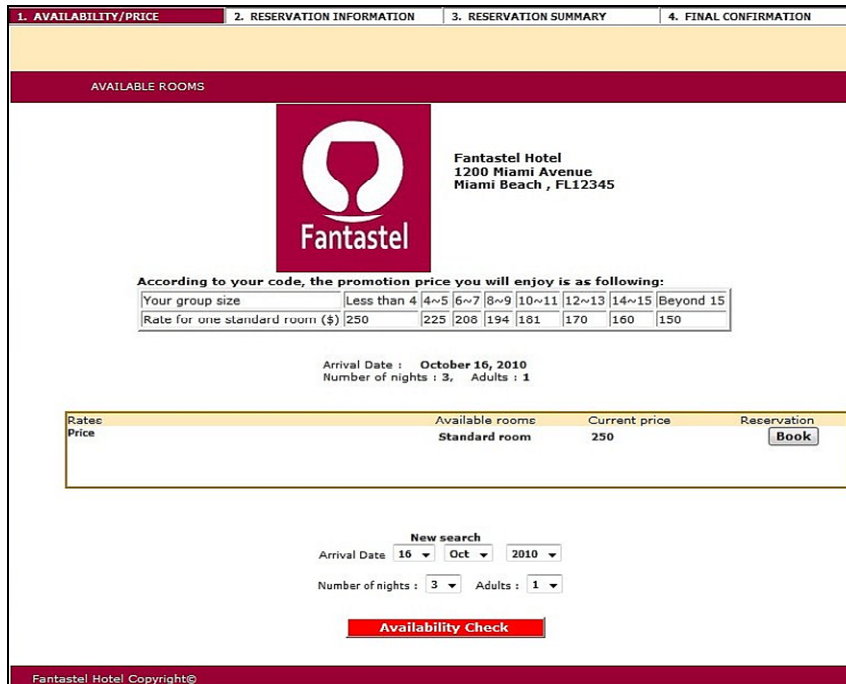


Figure 3
The Reservation Process Showing Predetermined Price Schedule Information

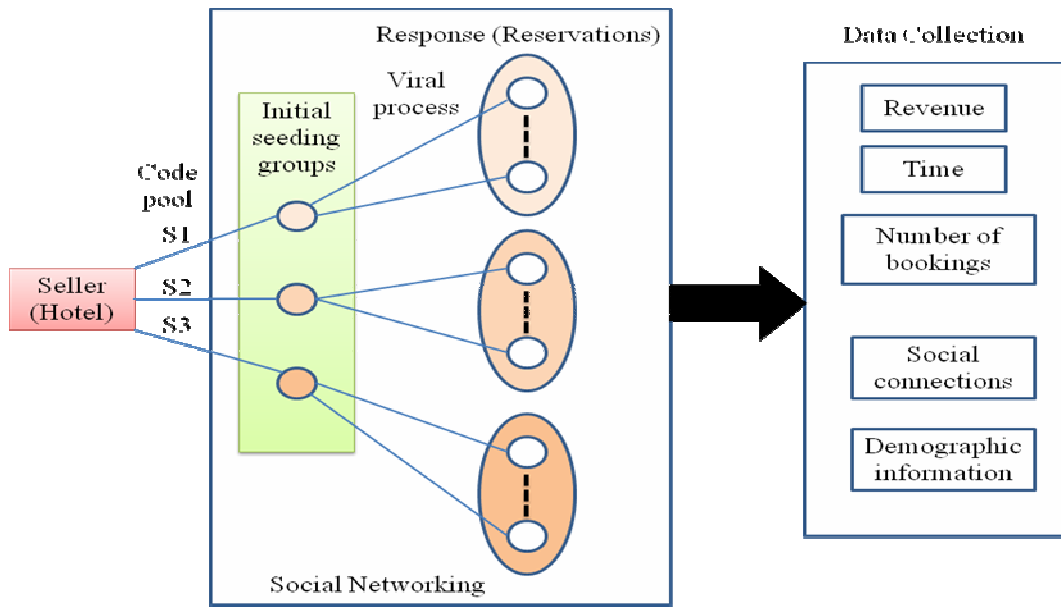


Figure 4
An Illustration of the Experimental Procedure

DATA COLLECTION

Considering the difficulties in enrolling participants and the uncertain participating time needed, the authors adopted two channels as Amazon Mechanical Turk (<https://www.mturk.com/mturk/welcome>). AMT is an online market place for human intelligence tasks, where registered workers are paid to finish a task such as completing a survey. It was found that workers on AMT are mostly located in the US and present similar demographic characteristics as overall Internet population (Ipeirotis, 2010). The authors also created an event page and a fan page announcing this study and encourage friends from a variety of population to participate in this study.

However, both of the channels didn't work out as expected. Partly because of the higher task difficulty comparing with those of other common AMT tasks, only few valid responses were received through AMT even though the cash reward was high. Considering such barriers in an experiment setting, the authors employed another channel where similar incremental discount structure was applied to collect responses. 40 college students were recruited to this experiment and 165 valid bookings were received in total. Participants were given two weeks to participate. The students were advised that the final room price was directly linked to how many bonus points they would get in a particular course. If they can bring in more friends to book the hotel with them, the room price will drop according to the number of friends. The lower the price, the more bonus points they would get. Thus, parallel with the incremental discount pricing scheme, this bonus point assigning system was believed to induce a similar effect on students as in the real-world setting where customers often use their social networks to maximize their benefits.

The hotel booking Website has simulated three sets of inventory to run the three schedules simultaneously. 40 students were randomly assigned to three groups identified by a unique access code. Only one student didn't participate in this study. The code records different pricing schedule information. When a participant applied his or her access code to make a reservation, the code leads the participant to a unique pricing schedule scheme, and they were aware of the scheme before making any reservations. The differences in pricing schedules are only observable to the researchers.

DATA DESCRIPTION AND DISCUSSION

A summary of the data description is provided in Table 1. Of the 165 reservations placed on Fantastel.com, 114 were from female customers. 126 participants (76%) indicated that they were referred to this promotion. It is noted that not all students participated in this study. The age range of the participants is from 18 to 77. The age of the participants ranged from 18 to 77 and the average age of the participants is about 29. In order to understand how participants were connected, the authors also investigated the usage of referring media such as online media (eg., Email, instant messaging, Facebook, etc.), telephone, in-person, and other channels. The results showed that about 11 percent (18 participants) of the sample were referred by more than one medium. Online medium was used the most frequently (117 times), followed by telephone communication (25 times) and in-person communication (19 times). When asking the participants' planning medium for referring friends, 43 participants reported that they would use more than one medium and that online media was the preferred method. In the actual usage, 110 participants used online media, followed by in-person communication (29 usage) and telephone (13 usage).

Table 1
Data description (n=165)

1. Demographic Information	Gender (M, F) (114, 51)	Age (min, max) (18,77)	
2. Average Participant Network Size	Claimed 4-5	Actual 3-4	
3. Most frequently used media	Online media	Telephone:	In-person
Being referred:	117 times	25 times	19 times
Referring others:	110 times	13 times	29 times
4. Most convincing referral method (114 responses)	65 times	25 times	26 times

The results also revealed that each participant believed he or she can persuade 4 to 5 friends on average to join the purchase network, which close to the number of friends the participants actually referred (3 to 4 on average). Participants were asked to rank-order their perceived most convincing referral method among online media, telephone, in-person, and other channels. 114 valid responses were collected for this question. Compared with telephone communication (25 times) and in-person communication (24 times), online media was perceived by 65 participants (57 %) as the most convincing way to persuade their friends to join the purchase network. This interesting result suggested online media is taking a priority role in respondents' choices for persuading others. Besides the convenience of online media, the message traveling speed, enlarged network scale, and more approaches to explain the message were considered by the authors as the three major reasons for this convincing effect. In fact, during the experiment, one student set up a Facebook Fan page to encourage his friends to join the purchase network, providing detailed information of the promotion and responsive comments. This student finally attracted 12 friends in his purchase network.

From the business perspective, out of the 165 valid responses, schedule 1 achieved 75 bookings, schedule 2 got 48, and schedule 3 got 42. By dividing the number of orders numbers by the active experiment time frame (from day 1 to day 11), Figure 5 shows the fluctuations of the orders of each schedules.

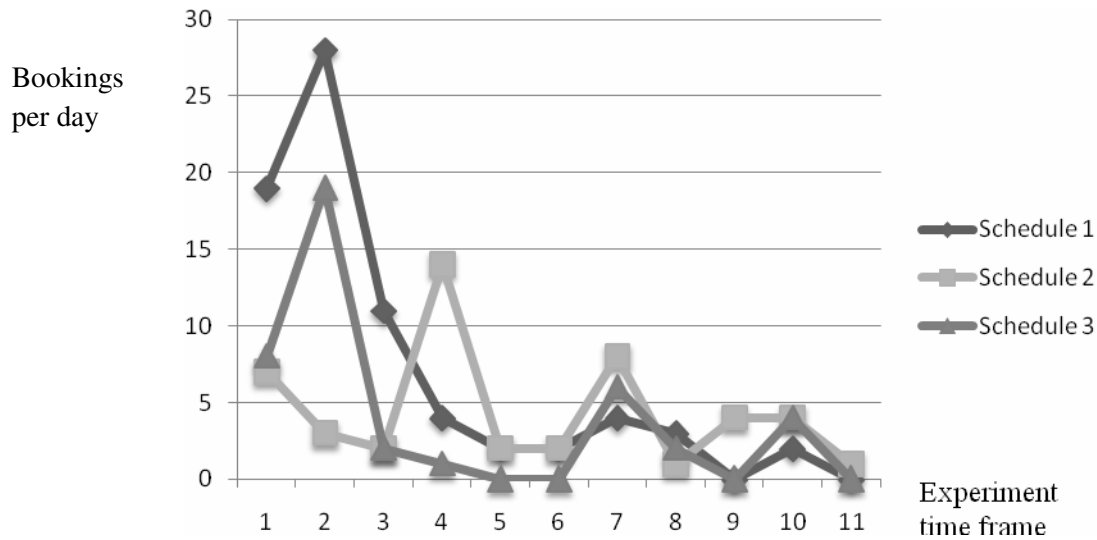


Figure 5
Performance of Three Schedules by Day

Figure 5 above provides an overview of the performances of the three schedules. They followed a similar pattern of booking increasing at first and dropping later on. Since it set that the room price will drop to 150 dollars as the final discounted price once the order number reaches 15 for all schedules, the pattern can be partly attributed to participants' awareness of the achieved price. In particular, the authors emphasized the incremental discount during each customer's reservation process. In general, Schedule 1 achieved the most bookings (75 orders) and also the highest gross margin as 13,291 dollars. The difference in code usage was taken into account in the gross margin calculation process. By aggregating the multiplied result of each code's usage and final price for each code, the gross margin for each schedule in the given experiment time frame is then provided in Table 2.

Table 2
Order Number and Gross Margin of Three Schedules

Network Size	< 4	4 and 5	6 and 7	8 and 9	10 and 11	12 and 13	14 and 15	Beyond 15
S1								
Rate for one standard room (\$)	250	225	213	200	188	175	163	150
number of bookings	75							
gross margin(\$)	13,291							
S2								
Rate for one standard room (\$)	250	225	208	194	181	170	160	150
number of bookings	48							
gross margin(\$)	9,386							
S3								
Rate for one standard room (\$)	250	225	192	175	165	158	154	150
number of bookings	42							
gross margin(\$)	8,194							

Schedule 1 (S1) offered the slowest discounting rate as the purchase network size increased. S1 generated the most number of bookings and achieved the highest gross margin. It was also the fastest schedule to reach an expected sales goal. It is possible that the slower pricing decreasing scheme is more effective in motivating potential customers because of the higher difficulty perceived in achieve the same discount. As number of bookings achieves a certain point, the gross margin will compensate the loss from discounting.

CONCLUSIONS AND IMPLICATIONS

This empirical study started to explore the potential of incorporating viral marketing process and group buying with an incremental pricing strategy in hotel industry. The authors attempted to further understand the marketing opportunities brought by online environment and social network for hotel industry. The performance of the three pricing schedules yielded important insights into potential buyer behaviors when exposed to different group size based pricing schedules. This study showed that a slower decreasing pricing seemed to perform the best. Compared with the other two schedules tested in the experiment, this schedule (S1) offers a lower discount for customers of same group sizes. It seemed to attract the most customers, deliver the highest gross margin, and sell the fastest.

This study also suggested that using incremental discount as a viral message promotes sales delivers satisfying results. 76 percent of the participants are referred by the initial selected participants. In other words, the hotel was able to attract much more customers and do business with them directly through this strategy. The hotel could then gather those customers' information and cultivate them into future promotion senders to continue the viral marketing process.

Online media were the preferred choice for customers to communicate the promotion message with their friends. The convenience, enriched functionality offered by online environment, faster speed,

and exponentially increased scale are the several factors behind why customers choose online media over traditional media. On average, a respondent attracts 4-5 people to join the purchase group in the experiment setting. This may suggest a significant opportunity for hotels to promote relationship marketing, where one current customer can bring in other customers. By developing an effective incentive system such as an incremental discount, it is believed that hotels can attract larger groups sales through their current customer base.

However, due to the nature of experimental design, the readers should be cautioned that the incremental bonus point system might not deliver similar performance as incremental discount in the real world. Since participants don't have to actually pay for the hotel rooms, future experiment can impose some artificial "difficulties" to simulate the expense for participants, such as increased requirement to achieve a higher bonus. Also, because of the time constraint, this experiment was only tested once. Multiple runs of testing and other populations are needed to gather more data points to further understand how potential customers will react to different discount-network schedules.

In summary, this study illustrates a business model to sell the inventory directly to larger groups of customers and offer an opportunity for hoteliers to gradually become independent of third party distributors. By utilizing this model as a complementary marketing strategy, hotels may take back control in inventory and product price management. There are plenty of research opportunities after this study, such as understanding customers' acceptance process, customers' attitude change regarding their informed status, and evaluating network effect and switching cost in such marketing approach.

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