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The Effect of Referral Network

on the Customer Loyalty

고객추천 네트워크가

고객 충성도에 미치는 영향

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Abstract

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This research investigated the effect of the referral connections in customer referral program on the loyalty of referred customers. Customer referral program motivates existing customers' participation providing rewards when the referral succeeds. A recommender refers an acquaintance to the service after considering the demand for the service, and the referred customer who signed up for the service through this process refers the service usage pattern of the recommender. Referral connection, the relationship between a recommender and a referred customer, in this sense reveals more direct and more mutual relationship than general social connection does.

The authors explored how the referral connection is related to the referred customer's loyalty with respect to the referrer's loyalty and referral pattern. Two qualitatively different problems should be considered to analyze the referred customers' loyalty, since they first determine whether to use a service or not, and decide how much amount of service they use. The results showed that a referred customer is more likely to buy the service when the referrer spends less and provides a recommendation less frequently.

This study initially suggested the referral connection as a factor to explain the customer loyalty. Also, the authors found when referred customers are more likely to be paying users, showing that referrer's order amount and referral pattern affect referred customer's likelihood to purchase the service. The results thus imply that marketing managers can enhance marketing efficiency considering not only whether a new customer was acquired

from referral program but also which existing customer referred the new customer.

Contents

1. Introduction

Customer referral program(CRP) is a type of stimulated WOM which aims to acquire new customers through giving rewards to existing customers. All the processes of the CRP are deliberately initiated, actively managed, and continuously controlled by the firm (Schmitt, Skiera, and Van den Bulte 2011). Service industries such as telecommunication, financial service, and online retail widely uses CRPs as a mean to establish their customer bases (Garnefeld, Eggert, Helm, and Tax 2011). Customer referral programs function with three players: (1) the recommender who make a referral to his or her acquaintances, (2) the referred customer who become a new customer through the referral, and (3) the firm providing rewards to the recommenders if the referral succeeds.

Previous studies on CRPs have explored the drivers of referral likelihood (Biyalogorsky, Gestner, and Libai 2001; Kornish and Li 2010; Ryu and Feick 2007; Wirtz and Chew 2002). Other research confirms that participating in CRPs increases the loyalty of both the referred customers and the recommenders (Schmitt, Skiera, and Van den Bulte 2011, Garnefeld, Eggert, Helm, and Tax 2011). Although CRPs have been showed to be a cost-efficient way to gain new customers who contribute more profits to firms and churn less, marketing managers wonder if current customers participate in the CRPs only to get rewards from referring new customers who sign up for the firm's service due to their intimate relationship with the recommenders but have no will to use it afterwards. From this managerial point of view, our study investigates the boundary condition from which we can determine which referred customer is more loyal than nonreferred customer.

In this paper, we would investigate how the recommender's information contribute to predicting the loyalty of the referred customers as well as to computing the referral value of the recommender (Kumar 2010) using the data of a mobile laundry service. Mobile services usually give rewards as soon as the receiver of the referral enroll the services, so many referred customers might have enrolled just to give rewards to the recommender. Accordingly, quantifying the performance of the referred customers is important for the mobile services to maximize its profit since some of the referred customers might show lower performance than non-referred customers, although they generally have higher likelihood to be more loyal than non-referred customers(Schmitt, Skiera, and Van den Bulte 2011). The authors also examine that the loyalty-related behavior of the recommender even after the recommendation also affect the loyalty of the referred customer. In this way, this paper advances previous studies suggesting a way to structure a segmentation among the referred customers.

2. Literature Review

The main object of this research is to predict customer loyalty using the information of referral connection patterns among CRP participants. In this way, our work draws on two broad research streams: (1) the literature on customer referral programs and (2) the literature on the relationship between social connections and customers' decision making.

2.1. Customer referral program

Previous studies on customer referral programs have explored how to increase the referral likelihood. Ryu and Feick (2007) found that rewards are more effective in increasing referral when the referral is made for weaker brands and to weaker ties. They also revealed that the stronger ties and brands, the more the reward increases referral when at least some of the reward is given to the receiver.

Other researchers investigated CRP with respect to maximizing the firm's profit. Biyalogorsky, Gestner, and Libai (2001) found the optimal combination of reward and price which yields the most profitable referrals. Kornish and Li (2010) showed that the recommendation functions also work as a signal of the value of the recommended product or service, so the greater concern for others' outcomes would increase the optimal referral bonus. Kumar, Peterson, and Leone (2010) suggested a new way to predict the most profitable customers with referral program combining the information of both customer lifetime value (CLV) and customer referral value (CRV), which yields higher performance than considering only CRV as former researches did.

Several researchers have been examined whether referral behavior affects the loyalty of the players of CRP. Schmitt, Skiera, and Van den Bulte (2011) said whether a customer received a recommendation matters, finding that referred customers contribute higher margin as well as to churn less than non-referred customers. In addition, Garnefeld, Eggert, Helm, and Tax (2011) showed that participation in a referral program has been showed to enhance not only the loyalty of the receiver of the reference, but also that of the provider of the reference. They also confirmed that relationship more pronounced when the provider's tenure is shorter.

2-2. Social connections and customers' decision making

Participants in referral programs are related with each other, because referrals generate connections between referrers and referred customers. In this sense, literature in social connections need to be investigated to enrich the discussion of referral programs with respect to connected relationship among participants.

How does the number of connections affect the influential power of an individual? Katona, Zubcsek and Sarvary(2011) showed that individuals with more connections may have, on average, less influential power to each connection. In the context of referral programs, the results mean that referrer who made more referrals might actually have a weaker effect on the referred customers' behavior.

Does the social relationship of an individual matter to his or her leaving a service? Nitzan and Libai (2011) gave an answer to this question. They verified that a customer tends to defect more when he or she is in the close group of higher churn rate. We might extend this finding to literature of referral program, verifying a referred customer is more likely to defect when the referrer has already stopped using the service.

2-3. Current research

Our model is based partly on the approaches that Schmitt, Skiera, and Van den Bulte (2011) propose. However, this study examined loyalty of customers, not considering the relationship of users in the analysis. To be specific, the authors considered only the referred customers, not including referrers in their model. In contrast, in the current study, we develop and estimate a model involving all the participants in the referral program and their referral connections.

3. Hypothesis

Our main question is whether the referrer's loyalty affect the referred customer's loyalty. We assume that the relationship between two loyalties is positive. This assumption is based on a social dynamic, homophily, which can be understood with a famous proverb, "birds of a feather flocks togerther".

Homophily is the principle that it is more likely that similar people contact with each other than dissimilar people do (McPherson, Miller, Lynn Smith-Lovin, and James M. Cook 2001). When we apply homophily to the literature of referral program, it is expected that referrals occur among similar people more frequently than among dissimilar people. We anticipate that a referred customer's loyalty would be similar with the referrer's loyalty. Therefore, the former is presumably predicted by the latter.

We used order amount and churn to measure customer how much the customer is loyal to the service as previous researches did (Gupta and Zeithaml 2006; Wiesel, Skiera, and Villanueva 2008; Schmitt, Skiera, and Van den Bulte 2011; Garnefeld, Eggert, Helm, and Tax 2011). In addition, whether a customer made an order at least once or not was also used to measure customer loyalty at early stage of customer life cycle, because it tells who the customer is: paying user or free user.

Customers participate in referral program through three decisions. They decide whether they sign up for the service of which they got a referral, whether they make any order of the service, and how much amount of money they would spend for the order. We built up hypothesis for the last two decision with the data on customers who already signed up for the service through referrals, because the firm from which we get the data for the research did not gathered the data for the first decision. The decision on signing

up would be investigated in the future research. Along this theories, we build up hypothesis are as follows:

H$_1$: The more money the referrer spends to the service, the more likely a referred customer makes an order at least once.

H$_2$: The more money the referrer spends to the service, the more money a referred customer spends.

The influence of being in the similar position with someone close to oneself has been discussed by previous studies. According to balance theory (Heider 1946; Heider 1958), when a person is a customer of a firm which also has one of his or her friends as its customer, the person's emotional attachment and trust toward the firm is strengthened (Van den Bulte and Wuyts 2007). So the hypothesis derived from this theory is as follows:

H$_3$: A referred customer is more likely to leave the service when the referrer has already churned.

4. Model

4.1. Data Source

The authors used panel data on all customers who participated in the customer referral program of a mobile laundry for the research. The research was conducted using the data of all 1441 customers who had ever participated in the customer referral program between May 2015 and September 2016. 570 existing customers succeeded to let their acquaintances to sign up for the service, and 974 referred customers were acquired from the recommendation. 103 customers both provided and received recommendation.

The mobile laundry service is operated by a Korean venture company whose name we do not divulge for confidentiality reasons. It receives commissions from each orders by bringing the customers' laundries from their home to the local laundry stores and returning the washed laundries to the customers. If the referral made by an existing customer succeeds to have a new customer sign up, both the recommender and the referred customer receive reward points which amounts to KRW 3,000. Except for making an account, the referred customer did not have to meet any prerequisites (e.g., minimum amount of order) for both the recommender and the referred customer to receive the reward.

4.2. Variables

The dataset contains the information about the recommenders' and the referred

customers' behavior related to the enrollment, the referral, and the order of the service. The behavioral data of each customer are stored with unique identifier(UID) and time information, so that we could grasp the trend of the behaviors with respect to two dimension: individual and time.

We used revenue and churn to operationalize loyalty as previous researchers did (Schmitt, Skiera, and Van den Bulte 2011; Garnefeld, Eggert, Helm, and Tax 2013). For revenue generated by a customer, we considered both total revenue and average revenue to capture how much money a customer spent to the service in both absolute and relative terms. We considered the pattern of the referrals to measure how sincerely each referral was made. The number of referrals was computed as how many times each recommender succeeded to make his or her friend sign up. We also took the temporal distances of the referrals into account in both marginal and average terms. Temporal distance was calculated as interval between nearest two referrals.

4.3. Statistical Models

To test whether the recommender's usage and referral pattern affects the referred customer's usage pattern(H_1, H_2), we analyzed the data using logistic and linear regression. The zero outcome of the amount of the order means that the customers decided not to order any laundry service. On the other hand, from the positive outcome, we know that the customers decided to order a laundry service at specific amount. Thus, the outcome is composed of two qualitatively different decision makings; whether the outcome is zero or positive is determined by a user's decision on whether to use the service at least once, and the amount of positive outcome is determined by how much a user has need for the service (Greene 2012).

For the count data, Mullahy(1986) argued that Poisson or negative binomial model

have shortcomings of dealing with this kind of data and suggested a hurdle model as

follows:

$$P(Y_i = y | x_i) = \begin{cases} e^{-\theta}, & y = 0 \\ (1 - e^{-\theta}) \dfrac{e^{-\lambda_i} \lambda_i^{y}}{y! \, (1 - e^{-\lambda_i})}, & y > 0 \end{cases}$$

In this formulation, a binomial probability model governs the binary outcome of

whether a count variable has a zero or positive realization. If the realization is positive,

the hurdle is crossed, and the conditional distribution of the positives is determined by a

truncated-at-zero count data model. However, we cannot directly use a hurdle model to

test our hypotheses, because the dependent variable, average order amount of referred

customer, is continuous. Therefore, we conducted following regressions on the separate

decision makings which are formed into H$_1$ and H$_2$.

(1) $\Pr(I_i = 1)$

$$= \frac{\exp(\alpha + \beta_1 \text{PTOTORD}_i + \beta_2 \text{PAVGORD}_i + \beta_3 \text{PDIST}_i + \beta_4 \text{PAVGDIST}_i)}{1 + \exp(\alpha + \beta_1 \text{PTOTORD}_i + \beta_2 \text{PAVGORD}_i + \beta_3 \text{PDIST}_i + \beta_4 \text{PAVGDIST}_i)}$$

(2) RAVGORD_i

$$= \alpha + \beta_1 \text{PTOTORD}_i + \beta_2 \text{PAVGORD}_i + \beta_3 \text{PDIST}_i + \beta_4 \text{PAVGDIST}_i + \varepsilon_i$$

where

PTOTORD_i = Total order amount of the customer who provided a referral to customer i

PAVGORD_i = Average order amount of the customer who provided a referral to

customer i

PDIST_i = The temporal distance which means the number of days between the day on

which the referral made to customer i and the day the nearest referral provided by the

customer who made a referral to customer i

PAVGDIST$_i$ = Average temporal distance which means the average number of days between the nearest two referrals provided by the customer who made a referral to customer i

To test whether the defect of referrer leads to the defect of the referred customer, we used Cox Proportional-Hazards Regression for Survival Analysis. Proportional hazards models are a class of survival models in statistics. Survival models relate the time that passes before some event occurs to one or more covariates that may be associated with that quantity of time. In a proportional hazards model, the unique effect of a unit increase in a covariate is multiplicative with respect to the hazard rate. Using this model, we tested if the referred customers more likely to churn when their referrer has churned. The model is built as follows:

(3) $\log h_i(t) = \alpha(t) + \beta PCHUN_i$

where

PCHURN$_i$ = binary variable representing whether the referred customer has churned

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5. Results

The findings of the hypothesis are summarized in TABLE1.

The effect of total order amount of referrer on the referred customer's likelihood of order was statistically significant at the confidence level of 0.1%. However, the size of the effect was almost 0. Its effect on order amount of referred customer was also found to be marginally significant at the confidence level of 10%. Referrer's average order amount showed marginally significant influence at the confidence level of 1% on the referred customer's likelihood of order, but not on the customer's order amount. We expect the average order amount of referrer would positively affect the purchase likelihood of the referee, but the sign of the effect was negative. Referred customer's likelihood of purchase was 10% higher when referrer's average order amount is 100KRW less. It might be because current customers who use the service frequently exploit the referral system randomly providing recommendations to others only to receive the reward money.

Temporal distance variables were shown to have positive influences on purchase likelihood of referred customers, as we expected in the step of building hypothesis. Referred customer's likelihood of order is revealed to be significantly affected by both temporal distance to nearest referral at 5% of confidence level and average temporal distance of nearest referrals at 1% of confidence level. The purchase likelihood of referred customer increases by 1.8% as the period between the day of another most recent referral and the day of the referral for the referred customer increases by one day. Besides, the purchase likelihood of referred customer increases by 1.2% as the average days between the nearest referrals increases by one day. The amount of money used in

the service by referred customer was found to be not significantly affected by either temporal distance to nearest referral and average temporal distance of nearest referrals.

Consequently, the hypothesis that the referrer's order amount and referral pattern affect the referred customer's likelihood of order (H_1) is supported. Otherwise, the hypothesis that referrer's order amount and referral pattern have influence on the referred customer's order amount (H_2) is rejected.

We can also verify that the referred customer's defect is not determined by the referrer's defect. The effect of referrer's churn was shown to be not statistically significant. Therefore, the hypothesis that it is more likely that a referred customer churns when the referrer has already churned(H_3) is rejected.

TABLE 1

The effects of referrers' loyalty and referral pattern on referred customers' loyalty

	H_1	H_2	H_3
total order amount	0.000*** (0.000)	-0.003+ (0.002)	
average order amount	-0.001* (0.000)	0.728 (0.451)	
temporal distance to nearest referral	0.018** (0.006)	-9.241 (7.110)	
average temporal distance of nearest referrals	0.012* (0.005)	1.179 (6.585)	
Churn of referer			-0.469 (0.501)
intercept	-2.203*** (0.265)	962.928** (301.539)	
R^2		0.065	
Adjusted R^2		0.010	
AIC	377.44		

+ p < .1
* p < .05
** p < .01
*** p < .001

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6. Discussion

6.1. Key Findings and Contribution

This study initially showed that referral connection can be used to predict customer loyalty. Former study already showed that referred customers spends more, churn less, and thus yields more value to the firm (Schmitt 2011). Extending these findings, this paper suggested a way to subdivide referred customers in terms of expected likelihood of purchase using the information of current customer who provided a referral to the customer.

In this research, it was statistically revealed that the referred customer's likelihood of purchase increases when the average amount of referrer is lower, when the distance from the another recent referral is long, and when the average days between nearest referral days is long.

6.2. Managerial Implication

The results of this research practically provide managers with two benefits.

First, this research used behavioral variable as control variable for models. Managers more frequently use behavioral variable than demographic variable. Demographic data could be collected from customers through difficult and inaccurate ways: directly asking customers' information such as age and gender, or indirectly speculating it through other clues which customers left. On the other hand, behavioral data is easier to obtain and more accurate than demographic data, because it is

automatically generated by informational system in firms. Consequently, using behavioral variable, such as order amount and temporal distance of order, gives both practical and informational advantages to our model.

Secondly, managers can improve the efficiency of their marketing practices by setting priority order of whom and how to make referrals, noticing that loyalty and sincerity of the referrer affect the loyalty of the referred customers. If managers desire to make their customers spend more money with the same amount of marketing budget, they should promote loyal customers of their services to make referrals, because the customers bring new customers who would spend more than other customers referred by less loyal customers. Also, they should design referral programs in a way that a current customer sparsely make referrals considering who would benefit from and thus become loyal to the service.

6.3. Limitation and Further Research

This study has several limitations to be compensated by further research.

First, our data come from the laundry industry using mobile technology, which is not yet mature and saturated. Customer attrition thus cannot be purely due to a defection to a competitor, but also due to abandonment of the service. For such a reason, previous researchers used data from cellular telecommunication industry (Nitzan and Libai 2011; Garnefeld, Eggert, Helm, and Tax 2013) and bank industry (Schmitt, Skiera, and Van den Bulte 2011), but the authors could not obtain data from those industries. Investigating the churn behavior of users in those saturated industries would more exactly reveal what makes customers leave the service.

Furthermore, our data provide the information only on customers who completed

signing up for the service after being referred. This lack of richness makes the data unable to reveal how the loyalty of current customers affects the likelihood of referred customers' signing up. Through complementing the data, the influence of heavy users in a service could be examined in all three aspects of conversion: from referral to signing up, from signing up to purchase decision, and from purchase decision to purchase amount.

Finally, we determined whether a customer left the service through measuring the period from last use, because we wanted to consider passive churn as well as active churn with the assumption that long dormancy indicates that the customer no more uses the service. This arbitrary criterion is controversial to be used as a basis to identify the attrition of customers. This should be used rather as an auxiliary criterion of customers' deletion of application or account, which is more evident sign of the attrition.

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국 문 초 록

고객추천관계가
고객 충성도에 미치는 영향

　　본 연구는 고객추천프로그램(customer referral program)에서의 추천 관계(referral connection)가 충성도에 미치는 영향에 대하여 연구하였다. 고객추천프로그램은 새로운 고객을 가입시키는 데 성공한 기존 고객에게 보상을 제공함으로써 프로그램 참여를 동기부여 시킨다. 추천인은 자신의 지인이 서비스를 얼마나 필요로 할지 고려한 후 지인에게 서비스 가입을 추천하고, 이 과정을 통해 가입한 피추천인은 추천인의 서비스 이용 패턴을 참고한다. 이처럼 고객추천프로그램에서의 추천인과 피추천인의 관계, 즉 추천 관계는 일반적인 사회적 관계(social connection)보다 직접적이고 상호적이다.

　　본 연구에서는 추천 관계의 다양한 측면 중 추천인의 충성도와 추천인의 추천 패턴이라는 두가지 측면에서 피추천인의 충성도와의 연관을 탐색하였다. 추천을 통해 가입된 고객들의 충성도를 분석하기 위해서는 질적으로 다른 두 문제를 함께 고려해야 하는데, 피추천인들은 먼저 서비스 이용 여부에 대하여 결정하고 그 다음에 이용량을 결정하기 때문이다. 분석 결과 추천인의 주문량이 적을수록, 추천 주기가 길수록 피추천인의 구매 확률이 높아지는 것을 확인했다.

　　본 연구는 처음으로 추천 관계가 고객 충성도를 설명할 수 있는 요인이 될 수 있음을 보였다. 또한, 추천인의 충성도와 추천 패턴이 피추천인의 구매확률에 영향을 미침을 보임으로써 어떤 피추천인이 다른 피추천인들보다 과금 사용자가 될 가능성이 높은 지 예측할 수 있는 단서를 제시했다. 이 결

과를 통해 마케팅 실무에서 새로운 고객이 고객추천프로그램을 통해 가입하였는지 여부와 함께 어떤 고객으로부터 어떤 추천을 받았는지를 고려함으로써 마케팅의 효율성을 제고할 수 있음을 보였다.

주요어: 고객추천프로그램, 고객 충성도, 보상 프로그램, 구전, 사회연결망, 허들 모형, 생존 분석

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