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Preventing the Transaction Failure in Retailing Web System

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Abstract—This paper describes the concept of pricing and upgradation of websystem problems for an online retailer who used to have a group of strategic customers. Owing to many website problems in online purchasing, there occurs a risk of transaction failures. Strategic customers will predict this kind of occurence and they will take decision on purchase with respect to transaction success probability (TSP). Earlier, we recommend a threshold policy for online customers. The customer decides to buy the product if the valuation done by him for the product is more than a threshold orelse customer does not prefer. The threshold increases whenever TSP decreases, it also increases customer transaction cost , or customers become more less risky. Second, we identify the profit maximising price for every period and optimal policy for upgrade of websystem. There occurs a threshold for every period such that the online retailers should upgrade their web system to attain good TSP only if current TSP is lesser than threshold orlese upgrading is not done. The threshold increases if customer transaction cost decreases, customer valuations for the product become more, or customers become less risky. Third, we identify that the online retailer stops pricing higher by avoiding customer strategic behavior. The cost of ignoring customer strategic behaviour becomes important. The profit-loss rate of avoiding customer strategic behaviour increases whenever customer transaction cost increases, customer valuations for the product become lower, or customers become less risky

KEYWORDS: Online retailing, Threshold value, Technology adoption,Non-strategic customers

1.INTRODUCTION

Now a days many retailers created online websites for sales. So there is good increase in sales for past decades. Hence the number of customers purchasing through online is increased as per 2011 survey. Problems that occurs in online website are ubiquitous. Due to high traffic, there occurs large number of transaction failures. So the customers word-of-mouth effects damage the reputations of online retailers. Then the retailers sells the product for reduced price to attract customers which causes loss to them. Here we introduce change in selling prices and upgrading web systems to reduce online retailers losses from website issues. First, we define threshold for every period such that the online retailers should upgrade their web system to attain good TSP only if current TSP is lesser than threshold or else upgrade is not done. Second, this

ISSN 2348 – 7968

paper provides steps for the retailers ,how to price and when to upgrade the web system. The optimal price for each period is identified, and a threshold policy is declared for upgrading: There exists a threshold for every period such that the online retailer may upgrade the websystem to achieve highest Transaction Success Probability(TSP) .Third, this paper discusses the online retailer's cost of avoiding customer strategic behaviour and increasing the price .To avoid this impact ,the online retailer should increase customer valuations by creating impression and decrease the customer transaction cost .The rest of this paper proceeds as follows. Section II reviews the literature related to this paper. Section III presents the basic model and characterizes the customers' purchasing decisions. In Section IV, the online retailer's pricing and upgrading decisions are studied and sensitivity analysis is conducted.

2.RELATED WORKS:

[1] proposed the concepts of atmospheric qualities of online retailing a conceptual model and implications. A stimulus-organism-response frameworks used to describe atmospheric cues takes place in online store. Two individual concepts involvement and atmospheric responsiveness are hypothesized to maintain the relationship between atmospheric cues and shoppers affective and cognitive reactions. [2] suggested utilitarian and hedonic based motivations. This concept gives ideas about single product producing firms that incorporate continues technological progress, linear product demand and switching costs, and also costs reduction on experience. [3] suggested competition, learning and investment in new technology model. Here the disadvantages of new technologies investments and also experience based learning are described. The results of this model describes how the attractiveness of the model technologies can be related to firm's ability to understand using the current technology. [4] suggested optimal markdown pricing model. They show implications in presence of strategic customers. Display all (DA) and display one (DO) is used.in DA format the retailers displays with units that are available so that every arriving customer has accurate details about the actual inventory level. In DO format the retailer displays only one unit at present time so that every customer knows about the available product but not the actual inventory level. [5] suggested dynamic pricing under a logit choice model. Dynamic pricing model in which a retailer allot certain prices for a product to a customer, who decides to purchase based on the price provided according to a logit choice model. The main objective is to find a pricing policy that reduces the regret which is the expected difference between the seller's revenue and the revenue of a clairvoyant who knows the values of the parameters in advance. This model proves the T-period regret is log T. By creating ananΩ (log T) lower bound on the regret under an arbitrary policy, and presenting a pricing policy based on maximum likelihood calculations that achieves a matching upper bound for two unknown parameters we prove that the optimal regret is $\Theta(\sqrt{T})$. Many experiments proves that these policies performs well against other competitive strategies.

ISSN 2348 – 7968

3. PROBLEM STATEMENT:

There occurs many website issues, so there is a possibility of transaction failure during the process of customer online purchasing. These kind of issues leads to abandon transactions. It results in negative customer experiences. Due to transaction failure, customer will get defection, that causes huge losses to online retailers. Service failure normally occurs due to website issues.

4. SOLUTION APPROACH:

Analytical model is proposed here in which an online retailer sells a type of product to agroup of strategic customers through the Internet. The following results were obtained. First, we characterize a threshold policy for strategic customer purchasing. There exists a unique thresholdsuch that a customer will buy the product if his valuation is greater than the threshold and willnot buy the product otherwise. There exist a multi-period model in which the online retailer hasan chances to set price and upgrade its web system at the beginning of every period. Theoptimal price for every period is derived, and a threshold policy is proposed for upgrading. Thereexists a threshold for every period such that the online retailer may upgrade the web system to thehighest available transaction success probability (TSP) if the current TSP is below the thresholdand not upgrade otherwise. Sensitive analysis is conducted to investigate how the threshold andthe optimal profits of the online retailer change with various model parameters. Compared with nonstrategic customers who rejects the impacts of transaction failure, strategic customers anticipate the transaction failure probability and make purchasing decisions based on the utility of a successful purchase and disutility of an unsuccessful one. All the customers have unit demand in each period and heterogeneous valuations for the product.

5. METHODOLGY:

This model characterize a threshold policy for strategic customer purchasing. The customers will make an unsuccessful transaction with a probability $1 - q$ due to various website issues. Here we refer q as TSP. The customers have a homogeneous transaction cost $h(h>0)$for the online purchase, which includes time costs of searching, bargaining, paying bill by personal Internet bank, etc. There exists a unique threshold $x(q, h) > h$ satisfying

$$qu\,(x(q,h)-h)+(1-q)u(-h)=0$$

such that a customer will buy the product if his valuation $v \geq p + x(q, h)$ and will not buy the product if $v < p + x(q, h)$.

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Table 1: Threshold versus customer valuation

THRESHOLDS VERSUS CUSTOMER VALUATIONS FOR THE PRODUCT

	T for Period 1	*T* for Period 2	*T* for Period 3	*T* for Period 4	*T* for Period 5
A=35	0.4401	0.5662	0.6918	0.8171	0.9423
A=40	0.4483	0.574	0.6994	0.8245	0.9496
A=45	0.4546	0.5799	0.7051	0.8303	0.9554
A=50	0.4593	0.5847	0.7098	0.8348	0.9599

ISSN 2348 – 7968

Table 2: Threshold versus customer transaction

THRESHOLDS VERSUS CUSTOMER TRANSACTION COST

	T for Period 1	*T* for Period 2	*T* for Period 3	*T* for Period 4	*T* for Period 5
h=2	0.4497	0.5748	0.6999	0.8249	0.9499
h=4	0.4483	0.574	0.6994	0.8245	0.9496
h=6	0.4458	0.5726	0.6984	0.8239	0.9492
h=8	0.4409	0.5703	0.6971	0.8229	0.9485

Table 3: Threshold versus risk

THRESHOLDS VERSUS CUSTOMERS' DEGREE OF RISK AVERSION

	T for Period 1	*T* for Period 2	*T* for Period 3	*T* for Period 4	*T* for Period 5
a=0.01	0.4483	0.574	0.6994	0.8245	0.9496
a=0.03	0.4501	0.5751	0.7001	0.8251	0.95
a=0.05	0.4522	0.5764	0.7009	0.8256	0.9505
a=0.07	0.455	0.5778	0.7018	0.8262	0.9509

the decision regarding whether to upgrade the web system depends on the sign of $Ji(qi)$: If $Ji(qi) > 0$, it is optimal to upgrade the web system, and if $Ji(qi) \leq 0$, it is optimal to maintain the current TSP.

Proposition 4.4: For $i = 1, 2, \ldots, n$

a) $Ju_i(q_i)$ is regardless of q_i;

b) $J_{nu}i(q_i)$ is increasing in q_i;

c) $J_i(q_i)$ is decreasing in q_i

d) $V_i(q_i)$ is increasing in q_i;

e) the optimal policy for the firm is $q*$

$i = q_i$(i.e., not upgrade)

if $q_i \geq T$ and $q*i = q_i$(i.e., upgrade) otherwise,

where

$$T = \begin{cases} \max\{q \in [q_i, \bar{q}_i] : J_i(q) \geq 0\}, & \text{if } \max_{q \in [q_i, \bar{q}_i]} J_i(q) \geq 0 \\ 0, & \text{otherwise.} \end{cases}$$

Interestingly, the remaining analysis made numerically demonstrates that *T* has no explicit relationship with period number *i*(*i* =1, 2, . . . , 5). The relationship between threshold *T* and periodnumber *i* depends on the interactions of several parameters such as *qi* and *Ki*(*i* = 1, 2, . . . , 5). To reduce the negative effect of ignoring customer strategic behavior, the firm should increase customer valuations for the product by improving product design or more impressive advertisement and reduce customer transaction cost by improving better navigation aids. In addition, when facing less risk-averse customers, the negative effect of ignoring customer strategic behavior is smaller.

6.CONCLUSION:

Pricing and web system upgrading problems for an online retailer who faces a group of strategic customers. There is a possibility of transaction failure when a customer purchases a product through the Internet. The strategic customers can anticipate the probability of transaction failure and decide whether to purchase the product based on their belief in TSP.

1. This model characterize the optimal purchasing policy for customers. There exists a threshold such that a customer will buy the product only if his valuation for the product is above the threshold.
2. The optimal price of each period and identifythe optimal policy for web system upgrading is done. The

optimal policy for the online retailer to upgrade its web system is a threshold policy.

3. The online retailer increases the price if it avoids customer strategic behavior. So the cost of ignoring customerstrategic behavior can be significantly high.In addition, when facing less risk-averse customers, the negative effect of ignoringcustomer strategic behavior is lower.

7. FUTURE ENHANCEMENT:

In future we can focus on pricing and web system upgrading problems of a monopolist. It is more interesting to study similar problems when online retailers face competition from rivals. This paper assumes that the TSP does not depend on the number of customers who purchase the product. It is more interesting to study similar Problems when the TSP depends on the number of customers who try to purchase the product (e.g., the TSP decreases when the number of customers who try to purchase the product increases).

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