# Retail Web System Upgrading with Strategic Customer Using Threshold Policy

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***Abstract***
*This paper mainly deals with the problems that online retailers are facing by some group of strategic customers by upgrading web system and goods pricing. A monopolist price of a product for which stylized dynamic pricing model is considered at the beginning and the price change is done on the product after considering some set of constraints based on the product availability. Due to some network issues sometimes website may get problems at that time there may be a chance of transaction failure for customer during online purchasing. To predict this probability and doing purchasing opinion depend on the belief of Transaction Success Probability (TSP). Considering this there will be a threshold policy for purchasing by customers here it is going to consider it as first one: Customers buy products only if his valuation for products is above threshold (total reduced profit) otherwise they will not take it into consideration. The threshold rises as TSP degrades, or customers turn out to be risk averse. Here we obtain the best cost of each phase and make out the best strategy for online shopping site customizing by threshold and upgrade the system when present TSP is less than threshold. The online trader turns to increase the price if he disregards strategic customer behavior. The value of disregarding strategic customer deeds is significant. The profit loss cost of disregarding strategic customer deeds grows as customer transaction cost rises.*

*Keywords: strategic customer, online retailing, transaction failure, technology adoption*

## 1. Introduction

As of now if we consider many retailers are maintain their own online websites for sales and other purposes. So, there is a gradual change in sales if we compared them from past few years back. By these the number of customers purchasing their online also gets increased as per 2010 survey [1] [2]. Also there are some few problems that casus large number of transaction failures. This leads bad mouth talk that effects damage for the reputations of online retailers [3]. Retailers sell's the product for an affordable price for attracting customers that leads to loss to them [4]. For this we are introducing change in retailing prices and upgrade the web systems to minimize online traders losses occurred through issues occurred through websites. For this first we have to define one threshold value for every period for a group of products by which online traders can upgrade the web system for attaining a handsome TSP value only if their present TSP is lesser than Threshold value, else their upgrade is not done. Coming to second method here in this we present steps to the retailers, when to upgrade the system and finding the prices. Coming to this the optional cost for each session should be identified, a threshold policy was declared for upgrading: for this a threshold policy to every session so the online trader shall upgrade the web system for achieving outrageous TSP. In this paper third method mainly discusses the online retailer should maintain some good impression for customer valuations and also should reduce the customer transaction rate. By following all the methods by which an web site people can upgrade their websites by the help of updated web-site engineers by which we can expand the count of visitors and the time they spend on web site.

So for doing this based upon the customer wants, observing individual desires, we are proposing a well organized model in that the online trader retails a kind of commodity for a class of important customers by net. All the consumers have demand for one particular product in each session and different evaluations towards the product. There prevails a threshold for each session so that online trader shall upgrade web system towards extreme offered TSP. Tactful survey is organized to explore how threshold and best profits gained by the online trader varies with different criteria.

## 2. Literature Review

### 2.1. Online Retailing

This has tantalized a trillion of recognition, and several studies have appeared concerning issues in this field. The first one considers architecture of online site framework, the impact of online trading arrival over conventional retailing system. The following are the categories that include mixed channel [5], price competition [6], channel substitution and so on. Second focuses on purpose and characteristics of the online trading site [7]. To some extent focus on the attributes of the website, and rest on suggestions to how to design by considering customer mannerisms like customer shopping emplacement, and psychosomatic variables. Numbers of researches are dedicated to service/transaction failure of online trading. These researches mostly focused on the reason of cause and value of service /transaction shortfall & significance of service recouping. Besides, we initiate the concept of strategic customers those predict the chance of transaction failure and decide to purchase on belief in T S P.

### 2.2 Customer Behavior

Concerning customer desire was generally considered as extrinsic, that is demand function is normally a detailed function of cost or varied product characteristics [8]. This means, the consumers will involve in decision making activity, which is not just governed by the exigency stated at beginning. Some studies consider the business decision adding customer strategic behavior [9]. Su extended a model to judge the purchase timing. [10] considering a monopolist organization that sells a particular number to merchant, strategic consumers. Customers can necessarily decide when to buy and decide from where to buy. Customers may buy the commodity at present cost for upcoming use, but they acquire catalogue capital price. There account a subject to strategic customer those estimate chance of stock outs and decide to go to the trader. Consumers predict the future loss of value and decide the buying timing to raise their expected surplus.

### 2.3 Technology Adoption

Technology adoption has a wide history that initiates the notion of 'creative demolition', this tells about discovering & acquiring of a advanced renovation efficiently, ruin the existing model by extending it out dated. [12] Explains the organization adopts present ideal policy if its delay crosses a particular threshold. Organizations likely buy methods that were once handy though it is not beneficial. Some [13] reviewed impact of opposition on new methods considerations. Most prevailing information prescribes profit as a outcome of technology lag, employee customer choice technique to obtain the profit, that allows to concentrate on how customer manner affects the firms pricing and upgrading choice. [11] employ a customer choice technique for studying commodity group administration issue. Whereas, those customer choice technique varies from ours.

### 2.4 Risk Aversion

In the scope of OM, the study integrating this is substantial. Evaluating overbooking issue of risk-averse decision maker [14] gives the meaning of correlating stockpile incorporated by risk-averse factors, proposed a different agreement to correlate stockpile to downside-risk-averse trader & risk-neutral supplier. When these studies suppose the organization as risk averse in this paper infers consumers are treated as risk averse. Most significantly, the review queries of paper completely differ to above one. In common, representation of risk averse accounts:
a.    Concave utility functions corresponding to predicted utility theory.
b.    Mean-variance framework.
c.    Additional measurements like value-at-risk.

In this paper implementing first one and expects consumers has similar utility functions which is rising and curved and inwards. There occur many website problems, so that there may be probability of transaction breakdown during online purchasing by the customer. 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 loss to online retailers. Service failure normally occurs due to website issues.

## 3. Solution Approach

Analytical model is proposed here in that online trader trades a group of commodity for class of strategic consumer by the online shopping site. Firstly distinguishing threshold strategy to strategic customer buying. There occurs distinctive threshold so consumer will purchase commodity if her expectation is higher over threshold or else do not purchase the product. There exists a multi-period method in this online trader has a chance to fix cost and upgrade web site at starting of every session. The best price for every period is resulted, and a threshold policy is planned to upgrade. There occurs threshold for every session so that online trader upgrade the web site to the most available Transaction-Success-Probability if the present Transaction-Success-Probability is less than threshold or will not either upgrade the site. Careful investigation was done for checking-will the optimal profits & threshold of online trader check by different technological guidelines. Correlated to nonstrategic consumers those rejects impacts of failure(transaction), strategic consumers awaits the failure possibility and do buying decisions depending upon efficient purchase value and disability of failed transaction. Every customer has need for particular product in each session and different expectations towards the product.

## 4. Method

Suppose an organization that trades a particular commodity through online for constant populations in online shopping. The organization manufactures commodity at individual value of 'a' and trades it at a cost 'b' (b > a). Production value 'a' was extraneous, regulate to zero for clarity. Suppose a mart of M consumers mart size M is passive and large. A consumer has need for particular product & different estimations to the commodity that is a non specific value derived from a common-cumulative-distribution function F (x). Let f(x) be the equivalent probability density function and F1 (x) =1 – F(x) be equivalent corresponding CDF. Further, suppose f(x) is constant & F(x) has raising failure cost that is the failure cost r(x):= f(x)/-F(x) is a weakly raising.[15] This belief is made considering the below facts: presently, most people use the Internet, leading to more online shopper's sharing their views of purchasing on websites. Consumers may guess T.S.P by checking out their views of previous shoppers.

The following are the tables on various forms between thresholds and the customer values for product or transaction cost or level of risk aversion

#### Table 1. Customers Estimation for the Product vs Thresholds

|        | $T$ 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  |

#### Table 2. Customer Transaction Rate vs Thresholds

|        | $T$ 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. Customers Point of Risk Aversion vs Thresholds

|          | $T$ 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  |

To reduce the denying outcome of not considering strategic customer, the organization must raise consumer expectations towards commodity by improving its design or more stunning advertisement and reduce consumer-transaction-cost by improving best navigation assistance. At inclusion, while interfacing reduced risk-averse consumers, this effect of ignoring is smaller. This can be clearly understood by the following figure drawn based up on the model parameters for the above tables
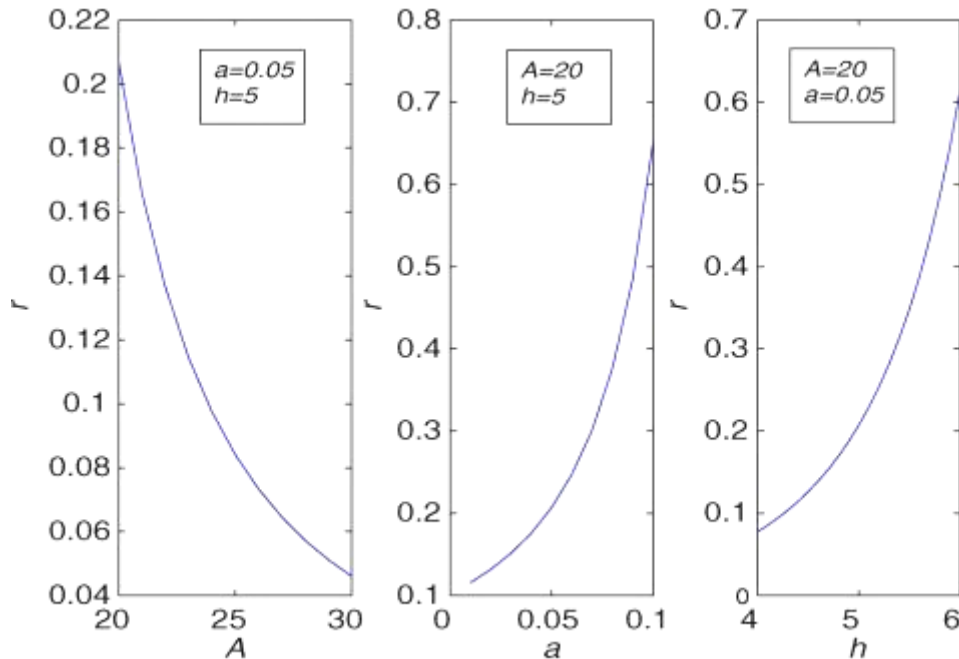


Figure 1. Model Parameters

### 5. CONCLUSION:

This paper mainly focused on the troubles that online retailers are facing by group of strategic customers by upgrading of web system and goods pricing. Because of some network issues website may get problems then there may be a chance of transaction failure. To await this possibility and do buying choice depending on belief of TSP. We specify the best buying policy to consumers: prevails an threshold there by customer will purchase the commodity if his estimation for the commodity is above the threshold. The best technique to online trader for upgrading his/her web site is threshold policy: prevails a threshold for every session so that the trader must upgrade web if present TSP is below threshold. The threshold rises when customer transaction cost degrades. These outcomes are vigorous as they are accurate for many extensions and dissimilarities of the model.

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